Children acquire language in the context of their psychological development and, in particular, developments in thinking, emotionality, and social interaction. The key assumptions in this chapter, therefore, come from an explicitly psychological theory of language development rather than from specifically linguistic theories or logical arguments in the philosophy of language. Linguistic and philosophical theories are important for understanding language, to be sure. But acquiring a language is always a psychological task for the child, not a logical one, and the linguistic problems to be solved are always embedded in a personal and interpersonal context.

In order to study language acquisition, we need to look at what language does and why children acquire language. Language makes it possible for individuals to share what they have in mind at a particular moment in time through expression and interpretation, because language embodies and makes manifest the beliefs, desires, and feelings that are their intentional states (Danto, 1973; Fauconnier, 1985; Taylor, 1979). Expression and interpretation make it possible for groups of individuals to share customs, systems of belief, and ways of living across many moments of time for the larger world view that holds a society and culture together. Thus, the motivation for learning a language, in the first place, is for expression and interpretation, so that the private and hidden contents of mind-intentional states-can be made public and shared between persons. A language will have to be learned for sustaining and promoting intersubjectivity with others beyond infancy, if child and other are to continue to "keep in touch" with what each is thinking and feeling as intentional states become increasingly elaborated with development. The multiple and detailed elements, roles, and relationships in intentional states that result from developments in cognition, emotion, and social understanding in the first few years of life can only be articulated by language.

These three concepts: (1) language as an embodiment of contents of mind; (2) the need to maintain intersubjectivity in an expanding social world; and (3) the driving force of developments in cognition, affect, and social interaction for acquiring a language provided the foundation for the model of intentionality and language development presented in
Language development, in particular, connects with all aspects of a child's physical, cognitive, emotional, social, and cultural development and is more than just acquiring words and the structures of grammar—language acquisition is not separate or special in development. The starting point of theory and research that take this explicitly psychological perspective is the mind of the young child and its development in a social world. This emphasis on mind in context has been the foundation for much of the last generation of child language research (e.g., Bates, Benigni, Bretherton, Camaioni, & Volterra, 1979; Bates & MacWhinney, 1982; Bloom, 1970, 1973, 1991, 1993; Bloom & Lahey, 1978; Budwig, 1995; Campbell, 1986; Golinkoff, 1983a, 1983b; Gopnik, 1982, 1988b; Gopnik & Meltzoff, 1985, 1987; Greenfield, 1978, 1980; Nelson, 1974, 1985; Ninio, 1995a; Ochs & Schieffelin, 1984; Schieffelin, 1990; Shatz, 1981, 1983, 1994; Snow, 1989; Tomasello, 1992a; Tomasello & Farrar, 1984; Van Valin, 1991; Zukow-Goldring, 1994, 1997). The model of intentionality and language development (Bloom, 1993) provides a unifying theory for embracing different perspectives on mind in context and encompassing the many aspects of development that determine how words and sentence structures are learned.

The intentionality model subsumes the narrower sense of "intentional communication" in instrumental definitions of language, where the assumption is that language is learned for socially and strategically influencing other persons' actions to get things done in the world, for example, "tool use" (e.g., Bates et al., 1979; Bruner, 1983a; McShane, 1980). When language is viewed primarily as an instrument, the emphasis is on the pragmatics of language use and the practical importance of language as a tool, following Vygotsky (1978). However, tool use is only one of the functions of language, and it is not basic. Expression is basic. Language influences other persons and their actions only because the words in an expression have the power to influence what others might have in mind—their beliefs, feelings, and desires—as a consequence of interpreting the expression. All the functions of language—including its personal, interpersonal, instrumental, regulatory, problem-solving, and other functions—depend on the power of language for expression and interpretation (Bloom, 1993).

Another perspective on language acquisition that is altogether different from this explicitly psychological perspective is inherent in research and theory which has, as its starting point, the end state and one or another theory of the adult language. The question asked is how the words, structures, and procedures of the mature language system are acquired, and the evidence from children acquiring language becomes useful to the extent it can support one or another theory. In particular, acquisition research influenced by theories of syntax derived from Chomsky (1965) has typically emphasized the specifically linguistic and innate principles (or biases or constraints) that the human infant is assumed to bring to the task of language learning (e.g., Baker & McCarthy, 1981; Crain & Thornton, 1991; Deprez & Pierce, 1993; Gleitman, 1990; Hyams, 1986; Hyams & Wexler, 1993; Lust, in press; Lust, Hermen, & Kornfilt, 1994; Lust, Suter, & Whitman, 1994; Pinker, 1984; Radford, 1990; Tavakolian, 1981; Wexler & Culicover, 1980). Research concerned with how the young child acquires what the adult knows about grammar is discussed by Maratsos (Ch. 9, this Volume).

Research and theory reviewed by Woodward and Markman (Ch. 8, this Volume) also invoke the assumption that children could not otherwise acquire word meanings without explicit guidance from biases (constraints or principles) that are specific to language following, in particular, the philosophy of Quine (1960) (e.g., Golinkoff, Shuff-Bailey, Olquin, & Ruan, 1995; Landau, Smith, & Jones, 1988; Markman, 1989, 1992; Waxman, 1990; Waxman & Markow, 1995). Both Woodward and Markman (Ch. 8, this Volume) and Maratsos (Ch. 9, this Volume) make clear that such approaches to acquisition do not imply that words and grammar are learned apart from other aspects of cognition and the child's context—no one expects children to learn language in a vacuum. Nevertheless, the larger developmental contexts of language and language learning are rarely taken into account.

In contrast, the selection of theory and research topics in this chapter is concerned with the kinds of knowledge that can be attributed to children's behaviors and the factors which influence the acquisition of that knowledge. The emphasis, by and large, is on the process of change in children's knowledge in the course of development from infant abilities to adult language capacities, and the personal and interpersonal contexts in which this development is embedded. Development is not "the gradual accumulation of separate changes...[but] a complex dialectical process characterized by...qualitative transformations of one form into another [with an] intertwining of external and internal factors" (Vygotsky, 1978, p. 73). Language is just one among many aspects of human functioning, but it
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touches on all its aspects: “Every behavioral act, whether outward bodily movement or internalized cognitive operation, gains its significance and status in terms of its role in the overall functioning of the organism” (Werner & Kaplan, 1963, pp. 4–5). Thus, both the external linguistic behaviors that we see and hear and the hidden knowledge that gives rise to those behaviors gain their significance only in relation to other aspects of human functioning. Language, as one aspect of a child’s development, depends on principles that serve development generally, rather than only principles specific to learning words and acquiring a grammar. However, language, cognition, emotion, and socialization are ordinarily studied as categories (or domains or modules) of human functioning. The categories or domains reflected in the titles of our scholarly organizations and publications are the result of emphasizing only one or another aspect of development in efforts to explain it. Nevertheless, these categories are not discrete categories for the young child, because they represent mutual influences on development that depend on each other. Just as developments in other aspects of cognition or emotion or social interaction do not happen apart from each other or apart from language, acquiring language does not happen apart from them. But studying the convergence of multiple strands of development is a serious challenge because of the complexities involved. In experimental studies, for example, variables need to be controlled that are considered “extraneous” to a task, such as cues from the environment that can influence a child’s response to the task. However, such variation, itself, often determines how language is acquired in real-life situations and contexts (e.g., Bloom, 1973, 1974; Bloom, Tinker, & Beckwith, 1995; Greenfield, 1982; Zukow-Goldring, 1994). Systematic variation is not “noise” but an essential aspect of the data of language (e.g., Labov, 1969; Sankoff, 1974), the data of language development (e.g., Bloom, 1991; Bloom, Miller, & Hood, 1975a; see Shore, 1995, for a review), and cognitive and physical competencies more generally (e.g., Thelen & Smith, 1994).

Language, itself, is typically separated into subsystems for studying acquisition of phonology, words, syntax, and discourse. Yet these subsystems are interdependent and synergistically related to each other and to the communication functions they serve (e.g., Bamberg, Budwig, & Kaplan, 1991; Bates & MacWhinney, 1982, 1987; Bloom, 1976, 1991, 1993; Bloom et al., 1975a; Budwig, 1989, 1996; Van Valin, 1991). For example, in the earliest phases of acquiring a grammar, the words in a child’s sentence, the kinds of syntactic complexity added to the basic sentence, and conversational context in which it occurs all make variable demands on a child’s cognitive resources and influence how much of the sentence the child is able to say. Two-year-olds are able to say longer sentences when they use well-known words, without added complexity in the sentence such as negation, and when they are not expected to participate in extended discourse. Conversely, sentence length is reduced when children use relatively new words, add syntactic complexity, or are pressed to respond to discourse demands (Bloom et al., 1975a). (See Langacker, 1987, for a related theoretical perspective, and Bloom et al., 1995; P. Bloom, 1990a; Boyle & Gerken, 1997; and Valian, 1991, for related findings.) The child’s developmental goal is the coherence of these several aspects of linguistic knowledge. The goal for those who study language development is to understand how this coherence is achieved.

In sum, one major purpose of this chapter is to emphasize that language development depends on the mutual influence among many aspects of development and is not separate and distinctive. However, this essentially integrative nature of development has not ordinarily been made explicit in theories of language development, as we shall see from the brief historical review in the next section. Following this historical review, the development of language is described in chronological order beginning with its earliest manifestations in the contexts of infancy, before the first words. In succeeding sections, three transitions provide a framework for describing language development from infancy through 3 years of age. The first of these transitions begins toward the end of the first year and continues in the second year with the emergence of words and acquisition of a basic vocabulary. The second is the transition from saying only one word at a time to combining words into phrases and simple sentences, which begins toward the end of the second year. The third transition is from simple sentences expressing a single proposition to complex sentences that express more than one proposition and the meaning relations between them. Complex sentences have their beginnings between 2 and 3 years of age but their acquisition continues well beyond the age of 3 years and into the early school years. Later developments in complex sentences are not within the scope of this chapter, but they are covered by Maratsos (Ch. 9, this Volume).

Unfortunately, space constraints on the length of this chapter have made it necessary to omit a critical factor which contributes to acquisition: the role of input from the environment. Contemporary research into the input children
depend on for acquiring language originated with the classic study by Snow (1972). The role of input assumed increased importance in the ensuing years with efforts to refute or support nativist assumptions in theories of acquisition. Research is now accumulating which points to the clear correspondences between adult language input and child language output, for example, in the sentence frames and verb alternations of early syntax (Beckwith, 1988; Beckwith, Tinker, & Bloom, 1989; Naigles & Hoff-Ginsberg, 1995) and the patterning between other forms of language and their functions (e.g., Budwig, 1996). (See Gallaway & Richards, 1994.)

The description of language development that follows here is concerned with how the forms of language—words and the structures underlying simple and complex sentences—are connected to their content and use in affectively and socially driven interactions and are acquired in the context of what children know and are learning about the world of persons, objects, and events. The chapter will conclude by invoking the need for further research that embraces the child’s intentionality as the driving force for language development and considers the contributions from all aspects of development to language acquisition, for a truly explanatory theory of language acquisition.

HISTORICAL PERSPECTIVES

The past two generations have seen several major shifts in child language research as one and then another theoretical perspective has gained influence and taken hold. As a consequence, the study of language development has been characterized by several theoretical tensions. These tensions have accumulated as existing theoretical perspectives have continued in the background (or foreground, depending on one’s point of view), while other theories have emerged in response to new issues.

Theoretical tensions in the study of child language began as early as the late 1950s with the challenge leveled against behaviorism (notably, Skinner, 1957) from the theory of generative transformational grammar (Chomsky, 1959). Until then, few had questioned the assumption that language behaviors in the environment are sufficient for children to learn language. Chomsky’s insight was that children hear sentences but they learn a grammar—the underlying rule system for generating sentences—and that grammar is not given in the environment. The assumption that children can learn language from the linguistic behaviors in the environment was strongly challenged, and the enterprise of studying language acquisition changed direction.

Chomsky proposed that acquiring a grammar must depend on what the child brings to language learning—which the child is born with that makes language learning possible. This innate endowment consists of the syntactic rules (or principles and parameters) that are universal and common to all the languages of the world (e.g., Chomsky, 1986). The question that has endured, however, concerns the relative contributions from environment and endowment to the child’s becoming a competent language user. The tension between environmental and innatist explanations of language acquisition that began 40 years ago with Chomsky’s critique of behaviorism continues today, and claims that human language is innately predetermined—is a gene as asserted by Pinker (1994) and others—have been vigorously contested by Elman, Bates, Johnson, and Karmiloff-Smith (1996), Tomasello (1995), and others.

Learning the forms of language depends on their function or meaning—children do not just acquire the formal syntax of the language—and they are guided in their acquisition of the semantic-syntactic structure of language by what it is they know about the world (Bloom, 1970; Brown, 1973; Schlesinger, 1971). Thus, interest in how children acquire a grammar turned, in the 1970s, to the semantics of children’s language and the role of meaning for acquiring syntax. Acquiring syntax does not stand alone as a formal, linguistic construct in the scheme of a child’s total development. "Rather, induction of underlying structure is intimately related to the development of cognition; accounting for the development of language competence must include an account of cognitive function" (Bloom, 1970, p. 232).

The inquiry into the cognitive precursors and constraints on language learning was soon joined (e.g., Piaget’s, 1954) account of cognitive development in infancy (e.g., Bates, 1976; Bloom, 1973; Brown, 1973). The result was a tension between this more general cognitive theory to explain how language as well as other aspects of symbolic behavior develop, and linguistic theory, which invoked an innate, specifically linguistic capacity for acquiring the syntax of a grammar. Inherent in this tension between specifically linguistic theories, on the one hand, and general cognitive theories, on the other, was the continuing tension between innatist and environmental emphases. Linguistic theories emphasized innate principles of universal grammar (what Chomsky called a “language acquisition device”) in the child’s mind. Cognitive theories emphasized
how the child's mind constructs many theories about the world, including a theory of language, as a consequence of interacting with persons and acting on objects.

The attention to context required by semantically-based research was soon extended to include developments in language apart from semantics and syntax, notably the pragmatics of language use in interpersonal and instrumental contexts (Bates, 1976; Bruner, 1975a, 1975b; Dore, 1975; Ervin-Tripp, 1973; Ryan, 1974). The result was to invoke another explanatory model, one that was socially based and heavily influenced by the social context. The tension that resulted was between more general cognitive theory (e.g., Bloom, 1973, 1991, 1993; Greenfield, 1978; Lifter & Bloom, 1989; Shatz, 1982; Sinclair, 1989), with emphasis primarily on the individual mind of the child, and social theories, with primary emphasis on how children acquire a language in interaction with others (e.g., Ninio & Snow, 1988, 1996; Ninio & Wheeler, 1984; Snow, 1989; Tomasello, 1992a, 1992b; Zukow, 1990). Cognitive explanations emphasized the child's contribution to development in contrast to the emphasis on the contribution from other persons in social explanations, with the social context being, at least, a "support system" (e.g., Bruner, 1983) that is "facilitative" (Snow, 1989) or even the determiner of language learning (e.g., Dore, 1983).

The 1980s saw the introduction of yet another research paradigm—"learnability theory" (Pinker, 1984; Wexler & Culicover, 1980)—with roots in the linguistic theories of adult language, notably the theories of Chomsky and his followers. The data of child language became evidence for the correctness of one or another theory of the adult grammar, because the adequacy of any linguistic theory was judged to be how well it accounted for language acquisition. Although "analyses differ in theoretical and empirical detail, they have in common the attempt to achieve some explanatory power by predicting the simultaneous or sequential development of linguistic structures. They also share the goal of providing a principled description of the intermediate stages of development by relating them to adult grammars, and theories of Universal Grammar more generally" (Hyams & Wexler, 1993, pp. 421–422).

Research that looked to cognitive development and the social context for explanations of children's language always presumed that adult language was the goal of development—a theory of the end state is crucial to any theory. However, the difference lay in the explanatory principles that were invoked—whether they were child-centered and concerned with explaining process in development over time, or adult-centered and concerned more with the correctness of one or another theory of adult grammar. These points of view also differed strongly in the nature of their explanatory principles (see the contributions in Piattelli-Palmerini, 1980). Cognitive and social developmental theories assumed that explanatory principles are more general, with language being only part of an individual's cognition and/or social interaction (Bates, Thal, & Marchman, 1991; Bloom, 1991, 1993; Greenfield, Nelson, & Saltzman, 1972; Shatz, 1981, 1994; Tomasello, 1992a, 1992b). Following Chomsky, learnability theory assumed that language acquisition depends on innate, specifically linguistic principles and processes (P. Bloom, Barss, Nicol, & Conway, 1994; Gleitman, 1981, 1990; Hyams, 1986; Pinker, 1984, 1994; and many others).

Most recently, a new thrust in language acquisition theory has emerged in the form of connectionist models of neurological processing for language learning (e.g., Davis, 1992; Elman et al., 1996; MacWhinney, 1989; Plunkett, 1995), following the lead of Rumelhart and McClelland (1986). Learnability theory had evolved out of the basic premise that the language input a child receives is too impoverished for learning the rules of grammar (that is, children hear only sentences but they need to acquire a grammar). In contrast, connectionist models assume that the information needed to acquire language is, indeed, available in the input, because children are not learning rules, per se. The tension that has now emerged out of these two positions is between models of the neural networks in the brain that represent information about language from the input, on the one hand, and, on the other hand, explanatory models that assume rule-based systems and invoke a strong, innately determined linguistic substructure, following Chomsky. Although the original connectionist models (Rumelhart & McClelland, 1986) and most subsequent research since used acquisition of the English past tense as the paradigm case (Davis, 1992; Marchman, 1993; Plunkett & Marchman, 1993), efforts have also been made to demonstrate connectionist models of syntactic learning (Elman, 1992; MacWhinney, 1987).

In sum, we have several theoretical tensions in language acquisition research today as a result of the last two generations of research efforts and their theoretical justifications. Even those theories of acquisition which focused more broadly on the psychology of the child beyond the child's words and sentences tended to emphasize just one or another aspect of development as central, such as cognition (e.g., Bates, Bretherton, & Snyder, 1988; Bloom, 1970, 1973; Greenfield, Nelson, & Saltzman, 1972; Nelson, 1974; Piaget, 1926, 1954); or social interaction (e.g., Bruner, 1983;
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Ninio & Snow, 1988; Tomasello, 1992a; Vygotsky, 1962); or, less often, the affective life of the child (e.g., Dore, 1983). Yet, all of these things necessarily come together: If we are to achieve a truly explanatory theory of language development, our theories and research need to reach beyond language and a focus on only one or another aspect of development. Functionalist theories have begun to do this, based as they are on pragmatics and communicative uses of language (e.g., Bates & MacWhinney, 1982; Bruner, 1983; Budwig, 1995; Dore, 1975; Nelson, 1988; Ninio & Snow, 1988, 1996; Shatz & O’Reilly, 1990; Snow, Pan, Imbens-Bailey, & Herman, 1996). However, functionalist theories, by and large, emphasize the instrumental function of language and how things get done in the world. But the instrumental function is only part of what language does, and it depends on the fundamental fact that language expresses, articulates, makes manifest the contents of mind so they can be shared with other persons—the expressive power of language is basic to all its functions.

The disparate threads of explanation in language acquisition can begin to come together only when theory and research embrace the wholeness of the child in the larger context of the child’s overall development. To achieve this will require setting aside the boundaries between historically separate developmental domains and embracing, instead, theories that encompass the mutual influences on development from all aspects of human thought and action (Bloom, 1993; Bloom et al., 1995; Lucariello, 1995). Although our theories, practices, and scholarly journals tend to come in categories, we cannot hope to fully understand human development unless we begin to transcend their boundaries.

The application of dynamic systems theory to understanding development (e.g., Kelso, 1995; Thelen, 1988; Thelen & Ulrich, 1991) invokes this theoretical goal. So far, however, application of systems theory has not gone beyond development within a single domain, such as in explaining early infant stepping or reaching in motor development, although efforts are being made to extend application to cognition and other aspects of development (e.g., Thelen & Smith, 1994; the papers in Smith & Thelen, 1993). Similarly, neural network or connectionist models could be applied to theories dedicated to understanding the multiple threads of influence on language development from the many personal and interpersonal contexts in which it occurs.

I have offered such an integrative model for explaining language acquisition by proposing that the core of development that brings an infant to the threshold of language at the end of the first year, and that motivates and sustains language acquisition in the succeeding years, is in the child’s intentionality and the necessary convergence of developments in affect, cognition, and social connectedness to other persons (e.g., Bloom, 1993; Bloom et al., 1995). Languages are learned because children strive to maintain intersubjectivity with other persons—to share what they and others are feeling and thinking. In the first year of life, before language, this intersubjectivity depends on the affect expressions between baby and caregiver. By the end of the first year, affect expression is well developed for intersubjectivity. But 1-year-olds have also had a year of learning about the world. The result of their early cognitive development is more elaborate intentional states that require expression and need to be articulated if they are to be shared with other persons. Language expresses and also articulates the contents of intentional states in a way that the forms of affect expression cannot. Thus, if language is to keep up with developments in cognition and social connectedness taking place in the first year of life, children need to acquire words and the procedures for sentences for expression and interpretation.

The focus in the Bloom model is on the young child’s intentionality—on the states of mind in consciousness that underlie all the child’s actions, including acts of expression and interpretation. Development depends on a process of transaction between internal representations in intentional states and the external social and physical world. This process is governed by certain generalizations I have called the principles of relevance, discrepancy, and elaboration (Bloom, 1993). According to the principle of relevance, development is enhanced when events in the context bear upon and are pertinent to what the child has in mind. The principle of relevance narrows the range of possible meanings that linguistic units can have, directing a child to the formal properties to be learned. Children learn linguistic units that bear on what they have in mind. According to the principle of discrepancy, development is enhanced when the child acts to resolve a mismatch between contents of mind and things already evident in the context. Developments in the ability to recall past events and anticipate new events create contents of mind that cannot be known from shared perceptions and assumptions in the here-and-now. Children will have to acquire a language, because what they have in mind must be expressed if it is to be known and shared by others who cannot exploit clues from the context for understanding. And finally, the principle of elaboration presses the child to learn increasingly more of the language. According
to the principle of elaboration, children will have to learn more words and, eventually, procedures for sentences, if they are to express and articulate the increasingly elaborated contents of mind made possible by developments in cognition and social and emotional understanding (Bloom, 1973, 1993).

A major goal in the rest of this chapter is to show how children learn the forms of language only in relation to the content and use of language forms, and how developments in language are integrated with developments in cognition, affect, and social connectedness in children’s everyday actions and interactions. The origins of this integration can be found in earliest infancy.

THE ORIGINS OF LANGUAGE IN INFANCY

Infants begin to work toward acquiring language virtually from the moment of birth. The context of language development begins with certain basic capacities serving communication and language that are already in place at the start of life. In the first few hours of life, a human infant attends to sights, smells, and sounds and can make some sense of them. For instance, a newborn infant can tell the difference between its own mother’s voice and a female stranger’s voice (DeCasper & Fifer, 1980) and can detect the difference between two vowel sounds (Clarkson & Berg, 1983). Shortly after birth, an infant will look into another’s face and, after wavering a bit, will settle on the eyes and stay there, intently gazing into another pair of eyes (Brazelton & Cramer, 1990). When only a few months old, infants can appreciate that a moving object has boundaries and obeys certain physical laws (Baillargeon, 1992; Spelke, 1988, 1991). And, from the moment of birth, infants display affect signals—frowns, whines, cries, and nascent smiles—which their caregivers interpret as meaningful. All these things contribute to the development of an intentional being in the first year of life—a person, with thoughts and feelings that include other persons and objects and events in the world. By the end of the first year, that person has begun to acquire a language for expressing this intentionality.

The behaviors in infancy that will prove to be relevant to the eventual emergence and development of language do not serve the functions of language originally. The sounds of speech are a good example. Speech sounds have their origin in the early vocalizations that accompany the infant’s breathing and eating; these are gradually refined into the sounds of babbling out of which the first words will eventually appear (Koopmans-van Beinum & van der Stelt, 1984; Oller, 1980; Ratner, 1994; Stark, 1980, 1986). The sounds of speech are an aspect of the form of language; other infant behaviors will contribute to the content or meaning of language; and the social contact and interpersonal relationships between the infant and other persons will contribute to eventual conversations and the pragmatics of language use.

Language consists of these three components: form, content, and use (Bloom & Lahey, 1978; Lahey, 1988). The shapes of words, the structures of sentences, the way the language sounds when it is spoken, or looks when it is configured by the hands in sign languages, determine the form of language. The sounds of the language make up its phonology; the words of the language make up its dictionary or lexicon; the inflectional and derivational construction of words make up its morphology; and sentence structures make up the syntax of language.

What the words and sentences mean—what they are about—is the content of language. The string of sounds /p-oh-n-i/ has meaning, is the word pony, only if it connects with the mental symbol of an object pony. The sentence “The pony jumped the fence” has content by virtue of the meaning of the individual words in the sentence plus the meaning relationships between the words pony and jump and fence. Language content depends on the semantics of language for the meaning of words and meaning relations between words. The orderly arrangement of words and their inflections in sentences according to the meaning relations they encode combines syntax, semantics, and morphology which, together, make up the grammar of the language.

The purposes of language and the different ways of saying more or less the same thing to achieve a particular purpose concern the pragmatics of language use. The use of language has to do with how we vary the forms of language in order to accomplish different purposes in different situations. How we get and give information, solve problems, organize events, get people to do things, and so forth depends on language to influence the thoughts and actions of ourselves and other persons. We need to use language differently in different sorts of circumstances in order to accomplish such purposes—taking into account where we are and to whom we are talking when we choose between, for example, “I’m thirsty,” “I need a drink,” “I’ll have a glass of water, if you please,” or “Gimme a Coke” for the same purpose.

Language is the integration of form, content, and use; the three components necessarily come together. Forms
without meaning, like *dak or nef*, are empty; randomly connected words, like “milk chase the,” are gibberish; we usually don’t say words and sentences just to talk—we have some reason or purpose in mind. Unless form, content, and use come together, we cannot use language for expression and interpretation. But the behaviors in infancy that anticipate the form, content, and use of language are not integrated with each other. Neither the early behaviors that anticipate the later forms of speech and sign language nor the early turn-taking behaviors that anticipate the eventual development of conversations are endowed with the kinds of content and purpose expressed by words in later conversational exchanges (Collis, 1985; Golinkoff, 1983a). These early behaviors originally represent more or less separate threads of development. They come together only gradually during the first year of life as infant abilities and social contexts inform each other in the process of development (Bloom & Lahey, 1978).

**Origins of Language Use**

A key factor contributing to the social connectedness between babies and caregivers is the timing between them as they look at each other and vocalize during their interactions; these synchronous interactions have been described as a “proto-conversation” (Bateson, 1975). The timing itself cannot be separated from the entire social package in which it is embedded—the rich array of visual, auditory, and kinesthetic information in a social display (Beebe & Jaffe, 1992; Stern, 1985). Sensitivity to timing involves sensitivity to affective and cognitive information in the interaction as well. Early patterns of gazing and vocalizing between infant and caregiver, at least in Western societies, indicate that the turn-taking capacities for the give-and-take interactions of conversation are in place at least by 3 months of age, however differently caregivers in different cultures might tap into them (Bateson, 1975; K. Bloom, 1977, 1990; Stern, Jaffe, Beebe, & Bennett, 1975; Trevarthen, 1977).

Vocalization from a socially responsive adult elicits a social response from a baby, whether the adult’s vocalization is contingent on the baby’s own vocalization or occurs at random. However, infants who experience contingent responding are more likely to pause after the adult’s response, their interactions assume the basic property of turn-taking, and they sound more speech-like than infants who experience random responding (K. Bloom, 1977, 1990; K. Bloom, Russell, & Wassenberg, 1987). Thus, the frequency and sounds of infant vocalizations in the first few months of life are responsive to social cues and other aspects of the context (Blake & de Boysson-Bardies, 1992; Delack, 1976; Delack & Fowlow, 1978; D’Odorico & Franco, 1991; Legerstee, 1991; Legerstee, Pomerleau, Malcuit, & Feider, 1987; Lewis & Freedle, 1973). Such sensitivity to context has been described by these and other investigators as the beginnings of the relationship between sound and meaning, which is critical to the eventual use of language.

An infant’s vocalizations also vary according to what the infant is feeling—both physically and affectively. This is true for crying and smiling, but more fine-grained variation in expression is possible. For example, the newborn’s cry begins to develop in complex ways as a function of physiological changes that take place in the vocal tract and developments in the capacity for articulatory-acoustic connections (Kent, 1981). Different patterns of cry have been identified that correspond to different internal states (Wolff, 1969). A baby’s typical cry is prolonged and waxes and wanes. Discomfort cries, however, are made up of short series of cry bursts. Caregivers can attribute feelings and physiological states to a baby on the basis of the shape of the cry and other noncry vocalizations as well, at least by the last quarter of the first year. The integration of the expressive behaviors of infants—their affect expression, vocalization, gaze, and hand movements—is influenced as well by other developments, for example in their more general motor abilities (Fogel, 1992; Fogel & Thelen, 1987; van Beek, 1991; van der Stelt, & Koopmans-van Beinum, 1986).

The threads of continuity from early prelinguistic communication to later communication with language can be found in infants’ affective and social connectedness to other persons, virtually from the beginning of life (Bullowa, 1979; Feagans, Garvey, & Golinkoff, 1983; Golinkoff, 1983b; Lewis & Rosenblum, 1978; Lock, 1978; Schaffer, 1977; Tronick, 1982; Ziajka, 1981). A prevailing theme is the sharing of affective meaning between baby and caregiver for the intersubjectivity that develops between them (Emde, 1984; Newson, 1977; Papousek, Papousek, & Koester, 1986; Rogoff, 1990; Stern, 1985; Trevarthen, 1977, 1979; Trevarthen & Hubley, 1978; Werner & Kaplan, 1963). The motivation for learning language is the infant’s need to sustain intersubjectivity with other persons and thereby locate the self in a social world (Bloom, 1993).

Infant and caregiver indicate their mutual attention and shared understanding to an object or event through joint
adjustments in posture, gaze, and head orientation toward one another. They eventually move from interactive contexts with shared affective meaning to contexts in which meaning is shared in speech (Bakeman & Adamson, 1984; Collis, 1979; Edwards, 1978; Stern, 1977), participating in what Sperber and Wilson called “ostensive-inferential communication” (1986, p. 63). Such mutual signals become particularly important in the second and third year as child and caregiver inform each other about the information in the context that might be relevant for word learning. But in the first year, shared signals sustain intersubjectivity between them and provide the foundation for the episodes of joint attention within which much of language will be exchanges without words long before language begins. The and caregiver inform each other about the information in early turn-taking patterns of infancy continue in the development of intersubjectivity particularly important because they stand for what we know about things in the world. When a child looks at the clock on the wall and says “tick-tock,” the act of reference has a mental meaning that gives rise to the behavior we observe. The mental meaning represents and refers to the object in the world; the word the child says names the representation in the mental meaning (Bloom, 1993). The symbolic capacity begins to develop in the first few months of life and makes it possible for the infant to construct mental meanings. These mental meanings are intentional states about persons, things, events, and relationships.

Constructing mental meanings or intentional states makes use of the knowledge about the world that is represented in conceptual structure in memory. Concepts and the relations between them are ultimately responsible for the content of language—both the meaning of object words like milk, relational words like more, and the relational meanings between words expressed by sentences. Concepts of objects, events, and relationships provide the bases for acquiring word meanings and the semantic structure of language. Such conceptual and eventually linguistic categories build on an infant’s early experiences that result in appreciations for the consequences of movement and change. The meanings of children’s words and their sentences in the second year have to do with movement and changes in location resulting from movement (Bloom, 1970, 1981, 1991; Bloom, Lightbown, & Hood, 1975b; Nelson, 1974). In turn, concepts of movement and location have been invoked for explaining the conceptual basis for adult language (e.g., Jackendoff, 1983, 1991; Langacker, 1987). The foundation for meaning and the content of language in general, then, is in the concepts of objects, movement, and location that begin to be formed in the first year of life.

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Origins of Language Content

The meanings of words make up the dictionary of a language. All who know the language share a mental dictionary of the words in the language, although individual dictionaries may differ in certain respects by virtue of differences in experience. The meanings of sentences are determined by the syntactic arrangements of words and morphological inflections on words. All who know the language share knowledge of the basic procedures for the grammar of the language. In turn, meaning in language comes from the knowledge about the world that is shared by the speakers of the language. For example, in order to know the word more, it is necessary to know something about the relationship of one thing or group of things to another; one needs to know something about ponies in order to know the meaning of the word pony. The knowledge about the world on which the meanings of language are based begins with cognitive developments in infancy, notably the symbolic capacity and conceptual structure.

Language itself consists of symbols. Words are symbols because they stand for the elements we have in mind in acts of expression and interpretation. Mental elements are named by the forms of language in expression and are “set up mentally, pointed to, and identified” by the forms of language in interpretation (Fauconnier, 1985, p. 2). Such mental elements are, in turn, symbolic because they stand for what we know about things in the world. When a child looks at the clock on the wall and says “tick-tock,” the act of reference has a mental meaning that gives rise to the behavior we observe. The mental meaning represents and refers to the object in the world; the word the child says names the representation in the mental meaning (Bloom, 1993). The symbolic capacity begins to develop in the first few months of life and makes it possible for the infant to construct mental meanings. These mental meanings are intentional states about persons, things, events, and relationships.

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The considerable literature on categorization and concept formation has been concerned, by and large, only with object concepts (see chapters by Mandler, Ch. 6, and
Woodward & Markman, Ch. 8, this Volume). However, the objective world is a world of affordances based on the relationships in which objects belong and into which they can enter (Gibson, 1979). When 1-year-olds use words like up, more, and gone, we can infer that they know something about the relational concepts for such words. But long before they use the words that express such relationships, infants show us in many ways that they already know something about the ways persons relate to objects and objects relate to each other (e.g., Bloom, 1973; Nelson, 1974; Mandler, 1992). Their earliest relational concepts are not learned through language. For example, using evidence from 1-year-old children's play, four relational concepts could be attributed to children's prelinguistic object knowledge—movement, location, containment, and support (Lifter & Bloom, 1989). Such concepts are prelinguistic because children construct relationships between objects with the general thematic relationship of containment and support long before they say the words in and on. These two words are among the earliest words children learn to say (Clark, 1973), but further research is needed for evidence of when children understand the words in relation to understanding the concepts of containment and support.

The relational concepts formed out of these kinds of appreciations of the effects of movement and change begin to develop before language and contribute to providing the content of language as it develops in the early childhood years. They include such concepts as nonexistence, disappearance, and reappearance, which contribute to learning particular words (like gone and more for instance) (Bloom, 1970, 1973; Gopnik, 1988a; Gopnik & Choi, 1990; Gopnik & Meltzoff, 1986; McCune-Nicolich, 1981). Other concepts such as containment, support, agency, effectance, and the like embrace such diverse thematic relations between objects as pouring milk into and out of cups, putting hats on heads, eating with a spoon, sitting on a chair, and so forth. These thematic relations are the everyday events with persons and objects that contribute to a child's knowledge base and, eventually, the content of language in the semantics of sentences.

Origins of Language Forms

Young infants' capacities that will eventually serve in learning the forms language can take include (a) vocalizations and speech sound perception, which anticipate learning the sound system of language; (b) hand movements, which anticipate the configurations and motions of sign language; and (c) the boundaries in sentences between words, phrases, and clauses. Although infants show us they know something rudimentary about the forms of language, these same behaviors, or behaviors derived from them, do not begin to become functional and integrated with meaning and the pragmatics of language use until the second year.

The units of mature speech are syllables, which are larger vocal-articulatory gestures than single phonemes or sounds, and they consist of consonant and vowel combinations. Their development begins in the first half year of life with maturation of the vocal-articulatory anatomy as well as the sensorimotor connections between audition and production systems (Kent, 1981; Kent & Miolo, 1995; Netsell, 1981; Oller & Eilers, 1988; Studdert-Kennedy, 1979). In addition to maturation, social factors contribute to the development of syllables. Infant vocalizing can begin to assume the contours of syllables as early as 3 months of age, when infants and caregivers engage in reciprocal and contingent vocal turn-taking. If an adult vocalizes just after the baby does, so that some representation of the infant's own vocalizing presumably remains within the infant's attention, the infant's vocalization assumes a more speech-like, syllabic quality (K. Bloom, Russell, & Wassenberg, 1987). The subcortical sensorimotor connections in such primitive articulatory matching afford a growing sensitivity to verbal input and infants' appreciation for the likenesses between the sounds they hear and the sounds they can make. These sorts of experiences lead, in the ensuing months, to the nascent cortical connections needed for the eventual approximation of speech sound categories (Kent & Miolo, 1995).

The beginning of the articulatory capabilities for actual words comes with the onset of babbling, some time between 6 and 9 months, when muscle control develops for coordinating a succession of consonant- and vowel-like sounds. In babbling, the baby's vocalizing has a clear syllabic form and consists of a series of consonant-vowel combinations. The babbling is reduplicated when each syllable in a string of babbling is the same. The consonants may be stops (like /d/), nasals (like /n/), or glides (like /y/), for example "dadadada," "nananana," "yayayaya." Adults now find it easier to imitate the baby because both the timing of syllables and the sounds themselves increasingly resemble the rhythm and sounds of adult speech. Nonreduplicated babbling, consisting of strings of syllables that combine different consonants and vowels and sound more like efforts to say words, has been reported in some studies to begin...
speech is only one of the possible forms of language. and children babble vocally, and their hand movements show the differences that have been observed in hearing children's vocal babbling. These similarities in timing and structure between manual and vocal babbling suggest "a unitary language capacity that underlies human signed and spoken language acquisition" (Petitto & Marentette, 1991, p. 1495). Thus, speech is only one of the possible forms of language, and although the vocal modality is obviously favored for speech, it is not privileged for the development of language.

Early hand positions and movements in the first few months resemble the gestures of mature language users (Fogel, 1981; Papousek & Papousek, 1977). For deaf children, these may anticipate the phonetic shapes of sign language, just as the early cry, comfort, and feeding sounds of hearing infants anticipate the eventual sounds of speech. Deaf infants, born to deaf parents who sign, babble with their hands and fingers at the same age that hearing children babble vocally, and their hand movements show the same kinds of consistency in phonetic and syllabic patterning that has been observed in hearing children's vocal babbling. These similarities in timing and structure between manual and vocal babbling suggest "a unitary language capacity that underlies human signed and spoken language acquisition" (Petitto & Marentette, 1991, p. 1495). Thus, speech is only one of the possible forms of language, and although the vocal modality is obviously favored for speech, it is not privileged for the development of language.

Early words grow out of a small number of core sounds that the infant favors in babbling, and the sounds that infants babble help to determine the words they do or do not acquire subsequently. Babbling continues after the first words begin to appear and continues to provide the phonological context out of which the young language learner will extract the sounds for words (e.g., Elbers & Ton, 1985; Georgiev, 1911, cited in Ingram, 1991; Locke, 1988, 1993; Miller, 1981; Oller & Eilers, 1988; Schwartz, 1988; Smith, 1988; Stoel-Gammon, 1985; Vihman, 1992; Vihman, Macken, Miller, Simmons, & Miller, 1985; Vihman & Miller, 1988). The fact that the sounds infants babble are the same sounds they use in their first words and, indeed, in the first several years of word learning, may be due to two factors. First, frequent words in the language—the words that children also learn earliest—no doubt contain the most frequent sound patterns in the language. Second, these sound patterns may be most frequent because they are within the capacities of the infant’s developing acoustic-articulatory system. Words in a language that are relatively infrequent, longer, and learned later may contain those sounds that are less likely to occur in babbling and the words of early vocabularies (such as the fricatives, /sh/; affricates, /ch/; and liquids, /l/ and /r/). In their speech to infants, caregivers no doubt use those words that are both consistent with infants’ sound-making capacities and relevant to what infants attend to and so learn about.

At the same time that very young infants’ sound-making capacities are quite immature, they are able to discriminate between different computer-generated speech sounds presented to them in controlled experimental tasks. Even newborns are able to detect differences between vowel sounds when the measure of attention (orienting response) is heart rate deceleration (Clarkson & Berg, 1983). Moreover, they perceive speech sounds categorically, in the same way that adults do. This categorical perception means that they hear the differences between sounds from two different sound categories, such as /p/ and /b/, more reliably than they hear the differences between sounds from the same category, such as variants of /p/. The original findings by Eimas, Siqueland, Jusczyk, and Vigorito (1971) have since been replicated for other speech sounds and among infants learning a variety of languages (Aslin, Pisoni, & Jusczyk, 1983; Eimas & Miller, 1981; Kuhl, 1987, 1994).

Categorical perception is mediated by a general psychoacoustic processing mechanism and is not a specifically linguistic ability, even though it will serve the eventual development of speech. For example, mammals who never acquire speech are able to perceive speech sounds categorically (e.g., Aslin & Pisoni, 1980; Kuhl, 1994; Kuhl & Miller, 1975). The infant data tell us that the processing system must begin to operate virtually at birth, providing a form of perception that surely facilitates, and perhaps even makes possible, the acquisition of speech (Miller & Eimas, 1983, p. 162). Speech perception abilities are soon modified by experience in hearing speech from adults in the environment, beginning in the first few weeks of life, so that infants learn to perceive new sound contrasts and lose the ability to hear differences between other sounds that are not phonemic in the language of the adults around them (e.g., Aslin & Pisoni, 1980; Kuhl, 1994).

Early perception of syllables has also been demonstrated in the first few days of life by infants who learned to discriminate between syllables like pat and tap (Moon, Bever, & Fifer, 1992). Older infants have shown sensitivity to the boundaries between linguistic units that are larger than speech sounds and syllables—the clauses, phrases, and words in sentences—when these are cued by rhythm and pause patterns inserted at the appropriate junctures in sentences (in contrast to pauses inserted within units).
Moreover, boundaries between larger units are detected before boundaries between smaller units (Fernald & Mazzie, 1991; Hirsh-Pasek & Golinkoff, 1993). Infants as young as 6 months old prefer to listen to speech in which pauses occur between two clauses in a sentence than speech in which pauses are artificially inserted within a clause (Hirsh-Pasek et al., 1987; Jusczyk et al., 1992; Mazzie, 1991; Hirsh-Pasek & Golinkoff, 1993). By 9 months of age, infants indicate preference for sentences in which pauses separate smaller units, like noun phrase and verb phrase, over sentences with pauses inserted within a phrase (Jusczyk et al., 1992). By 11 months, they show appreciation for the perceptual boundaries that separate words in sentences.

The original interpretation from these studies of infants' perception of the boundaries between linguistic units like phrases and clauses is that infants already have an appreciation for the syntactic form of sentences, even though they are not yet able to even understand words. Another, more conservative interpretation is that infants have learned only to discriminate vocalizations in their own language that are continuous (and sound more natural) from vocalizations that are interrupted by artificially inserted pauses (Fernald & McRoberts, 1996). They are not as likely to listen to linguistic units with unusual or infrequent pause patterns, but nonetheless, do appear to be sensitive to frequent patterns that are potentially important for learning syntactic structure (Gerken, 1996; Shady, Gerken, & Jusczyk, 1995). In addition, 9-month-old infants' appreciation for correspondences between prosody and linguistic boundaries is influenced by factors other than syntactic boundaries, like whether sentence subjects are nouns or pronouns and sentences are questions or statements (Gerken, Jusczyk, & Mandel, 1994).

In sum, the interplay between maturation and experience in the first year of life makes it possible for the baby to move from cries, coos, gurgles, and grunts to the tentative sounds and syllables of early words and eventually, to the units that make up the words and sentences of the language. These productions and perceptions are never divorced from the developmental context. From the very first cries, infants are expressing something, and caregivers readily tune into their sounds and try to understand them. Many factors—cognitive, social, cultural, and linguistic—come into play as the infant moves toward learning words and acquiring the grammar of a language. Cognitively, to learn words and the syntax of sentences is to learn how to express mental meanings—intentional states that are informed by what the infant has learned about objects, events, and relations in the world. Socially, learning words and syntax is learning how persons in a society make public what is otherwise private and internal to themselves and thereby influence each other's thoughts, feelings, and actions. Culturally, to learn words and procedures for sentences is to learn something of the values that have evolved in a society for creating and sharing a world view.

THE FIRST TRANSITION: EMERGENCE OF WORDS AND ACQUIRING A VOCABULARY

The basic contours of the emergence of language are agreed upon by most researchers; in fact, a description in an earlier edition of the Manual of Child Psychology more than 50 years ago remains appropriate:

The literature is in general agreement that the first sounds of the newborn infant are the overt elements from which speech develops, that vocalizations are used as a means of communication before words proper are used; that comprehension appears before the use of words; that the normal child has a repertoire of a very few words by one year of age, that development is slow in the first months of the second year, but that toward the end of that year a great increase in the speed of progress appears; ... that [use of words] for specific meanings is a developmental process; ... that the first words have the force of a phrase or sentence, and combinations of words do not begin for some time. (McCarthy, 1946, p. 488, quoting Dewey, 1935, p. 251, citing a survey in French by Decroly, 1934)

We can unpack this quote from McCarthy and report that research in the succeeding years has continued to document the observation that "the first sounds of the newborn infant are the overt elements from which speech develops" (e.g., Oller, 1980; Oller, Wieman, Doyle, & Ross, 1976; Stark, 1980, 1986). Other studies have shown how vocalizations are used in the context of communication before words appear (e.g., Bateson, 1975; Bullowa, 1979; Fogel & Thelen, 1987; Harding & Golinkoff, 1979; see K. Bloom, 1990). Still other research confirmed that "development is slow in the first months of the second year," ... that "toward the end of that year a great increase in the speed of progress appears," ... that the use of words "for specific meanings is a developmental process," ... that "the first words have the force of a phrase or sentence, and combinations of words do not begin for some time" (e.g., Anglin, 1977; Bates, Bretherton, &
First words begin at about the first birthday, give or take a few months. They are tentative, imprecise, and fragile at first, and new words are acquired slowly in the several months after words begin to appear. Some time toward the end of the second year things pick up, and children begin to learn more and more different words, begin to use their words more easily and readily. The words infants learn in the second year are guided by the perceptual attributes of the objects they name. Words are also learned in the context of actions and the functions of the objects they name, and learning words depends on learning about objects and events in general and acquiring concepts of particular objects, events, and relationships (Bloom, 1973, 1993; Clark, 1973; Gopnik, 1988b; Gopnik & Meltzoff, 1986; Lifter & Bloom, 1989; McCune-Nicolich, 1981; Nelson, 1974; Nelson & Lucariello, 1985).

However, beyond these broad descriptive strokes, we have less agreement on the details of early language and even less consensus on how best to explain its development. This is so because studies of lexical development in the second year have typically looked at only one part of the “whole” child or looked only at one aspect of language development from a single theoretical perspective. Efforts to explain early word learning have invoked different theoretical models, and these have been based alternatively on either social-pragmatic factors, cognitive developments, or principles and constraints that guide word learning. The result is an essential consensus with respect to the broad outline of development, less agreement on the details, and still less agreement on theoretical explanations of how words are acquired (Bloom, Tinker, & Margulis, 1993).

First Words
Young infants who are not yet saying words often show us that they recognize the words other persons say (Hirsh-Pasek & Golinkoff, 1991; Oviatt, 1982), and they can even be taught to recognize novel labels for novel objects (e.g., Woodward, Markman, & Fitzsimmons, 1994). The average age for early word comprehension in carefully controlled experimental tests is in the range of 12 to 14 months (Golinkoff & Hirsh-Pasek, 1987; Oviatt, 1980). However, many parents report that their infants begin to understand words and even say words much earlier, sometimes as young as 8 months of age (Bates et al., 1995; Bloom, 1993; McCarthy, 1946, 1954).

Before conventional words appear, many children use forms with some phonetic consistency that are “endowed with meaning” but are considered “nonstandard” or “unconventional,” because they are not consistent in form and meaning with a conventional word in the language (Leopold, 1939, p. 164). Halliday (1975) called such words “proto-language,” and Dore (1983) called them “indexical expressions.” Early grunt sounds were analyzed as a particular instance of such early efforts at communicating by McCune et al. (1996). Most parents readily respond to a child’s efforts to say words when the vocalizations seem relevant to the child’s intent to communicate and to what is going on around them at the time.

Endowing an infant’s vocalization with the status of a word is a more serious business for the researcher than it is for the parent. Parents are licensed to overattribute and, in fact, they and their infants may well enjoy and benefit from such attributions. But the researcher has the responsibility of transforming an infant’s vocalizations into data for analysis in order to obtain evidence for one or another conclusion, and so the importance of the criteria used cannot be minimized (see, in particular, Dore, 1983; Dore, Franklin, Miller, & Ramer, 1976; Dromi, 1987; Halliday, 1975; Leopold, 1939; McCarthy, 1954; Plunkett, 1993; Vihman & McCune, 1994). Such criteria draw on several aspects of an infant’s vocalization, including its phonetic shape, consistency, frequency, and meaningfulness in relation to something going on in the situation. The two criteria most often recruited together for crediting a child with words are aspects of phonetic shape and presumed meaning that are shared by a conventional word in the language.

Sometime toward the end of the second year, most children show a vocabulary spurt, and by the time they are 18 to 19 months old, have learned about 50 words on average (e.g., Bates et al., 1995; Bloom, 1973, 1993; Bloom et al., 1993; Dromi, 1987, 1993; Nelson, 1973). The number of new words apt to be learned on any given day during the preschool years is impressive. One estimate is that the average child who has reached the first grade is able to recognize about 10,000 words, including 6,000 main entry dictionary words in addition to derived words, and has learned an estimated 5.5 main entry words per day since the age of 18 months (Anglin, 1993). Another estimate is that children learn 13 new words a day on average before the age of 18 years—evidence of their ability to “soak up words” (Miller, 1986, p. 9; see also, Carey, 1978; Templin, 1957).
However, for statistical reasons, increase in vocabulary cannot be strictly linear because there is an inherent limitation in the number of words to be learned (Bates & Carnevale, 1993). This means that word learning probably shows several spurts in the course of development—the vocabulary spurt at around 50 words and before the transition to sentences in the second year is one; perhaps entry into school is an opportunity for another. Vocabulary spurts might be associated with other kinds of experience or cognitive development as well.

Similar developments underlie acquisition of signed words by deaf children. In some studies of the acquisition of signs, mothers of young deaf infants have reported conventional signs at a very early age—much earlier than is typically reported for words spoken by hearing children (Bonvillian, Oranskly, & Novack, 1983; Orlansky & Bonvillian, 1988; but see Newport & Meier, 1985 for discussion). Many hand movements made by both hearing and deaf infants have a counterpart in later gesture and mature sign languages—raising the question of whether deaf parents might be overinterpreting their infants' hand movements when looking for signs, just as parents of hearing children might overinterpret efforts at vocalizations as words. In studies involving more controlled observations, differences in onset of spoken and signed words have been negligible (Acredolo & Goodwyn, 1991; Petitto 1991). Nor do children learning sign language show an age advantage for later aspects of language acquisition (Newport & Meier, 1985). (See Lillo-Martin, 1996, for a full review of research in the acquisition of American Sign Language.)

Early words depend on perceptible objects and familiar actions and events for learning and subsequent retrieval and recall. Many developmental accounts of children's first words have noted the strong association between word and object, word and action, or word and event (e.g., Barrett, 1985; Barrett, Harris, & Chasin, 1991; Bates et al., 1979; Bloom, 1973; Dore, 1983; Dromi, 1987, 1993, 1996; McShane, 1980; Nelson, 1985; Nelson & Lucariello, 1985; Werner & Kaplan, 1963; Whitehurst, Kedesy, & White, 1982). In effect, infants perform a fast mapping or association that allows them to recall a novel word when recognizing the episodic cue with which it was associated originally. Fast mapping in comprehension tasks has generally been used to explain the relative ease with which older children seem to acquire new word meanings (Carey & Bartlett, 1978; Chapman, Bird, & Schwartz, 1990; Dollaghan, 1985).

Most research accounts stress the association between words and the functions of words in the situation in which the child hears them—the circumstances perceptible to caregivers and researchers as well as to the child (see Budwig, 1996 for discussion). The internal dimension of the child's experience of a word—the feelings and desires accompanying it—contributes to the relevance of the word for learning it but is considered less often. Children exploit external resources from the social and physical context—the adults around them who talk about their objects of attention and engagement (e.g., Bruner, 1983; Nelson, 1985; Tomasello, 1988, 1992a). But they also exploit their internal cognitive and affective resources, such as their propensities to categorize objects and events (e.g., Bloom, 1973, 1993; Gopnik & Meltzoff, 1987, 1993; Lucariello, 1987a; Markman, 1984, 1989; Nelson, 1974) and their affective engagement in what is going on around them (Bloom 1993; Bloom & Beckwith, 1989; Bloom et al., 1985). These are the factors that contribute to the relevance of words for learning them.

A word the child hears is relevant when its target is part of what the child has in mind, part of the representations in consciousness that are the child's intentional states—what the child is feeling and thinking at the time. "Relevance is the single property that makes information worth processing and determines the particular assumptions an individual is most likely to construct and process" (Sperber & Wilson, 1986, p. 46). Relevance is not the same as salience. For example, the Empire State Building at 34th Street in New York City is salient to people riding the 5th Avenue bus downtown, but not necessarily relevant unless, of course, they are reminded they need to meet someone on the corner of 34th Street. In the word learning situation, something that is salient to an adult is not necessarily relevant to what the child has in mind at the time, even when the adult calls the child's attention to it. What is salient in the context becomes useful to the child only when it is pertinent and bears upon or is connected to the elements, roles, relationships in the configuration in the child's mind, that is, when it is "information worth processing" (using the felicitous phrase of Sperber & Wilson, 1986). To be sure, what the child has in mind changes on hearing words (Woodward & Markman, Ch. 8, this Volume), but that is the consequence of all acts of interpretation.

Two of a child's resources, in particular, contribute to the configurations that determine the relevance of words and hence guide the child in discovering a word's meaning. One is the child's engagement—what the child is feeling about it at the time—and engagement is an affective process. The other is the child's understanding of the objects.
events, and circumstances in occasions of joint attention with caregivers, and this understanding is a function of cognitive development. Word learning is intimately related to developments in both affect and cognition.

Word Learning and Affective Development

Although affect expression and language are complementary systems of expression (Jespersen, 1922), affect has been largely left out of child language research and theory. Yet the affective life of a child has been considered crucial to other aspects of development—whether one’s perspective is traditional psychodynamic theory, attachment theory, or emotions theory. For example, according to Piaget, affect is the fuel that drives the engine of cognitive development (Piaget, 1981). Theories of infant emotion and development frequently emphasize the organizing function of emotions for the motivation and organization of actions (Barrett & Campos, 1987; Izard, 1977, 1986; Izard & Malatesta, 1987; Sroufe, 1984; Stern, 1985; Thompson, 1989).

Language and affect provide two different forms of expression for expressing different aspects of mental meanings. Affect expression is already in place as the medium of sharing between infant and caregiver long before language and is the far more frequent form of expression when words begin toward the end of the first year. The onset of language in the second year does not herald a general increase in expressivity, however, because emotional expression does not also increase as speech increases between first words and a vocabulary spurt. But neither does the frequency of emotional expression decrease, and children do not express emotion less often as they learn language (Bloom, Beckwith, Capatides, & Hafitz, 1988). This finding means that children do not learn to say words instead of expressing affect. Although they learn to say more words and linguistic expression increases in the single-word period, they continue to express their feelings through displays of affect as they learn language for expressing what their feelings are about.

Words allow more explicit articulation of the elements, roles, and relations between them in intentional states than is possible with affective displays alone, and words become integrated into a child’s affective life in several ways in the course of development (Bloom, 1993). Children’s talk is very often about the circumstances, causes, and consequences of their emotional experiences, because these are the things that are relevant to them (Bloom & Beckwith, 1989; Bloom et al., 1988; Bloom & Capatides, 1987a; Bretherton, Fritz, Zahn-Waxler, & Ridgeway, 1986; Capatides, 1990; Capatides & Bloom, 1993; Dunn, Bretherton, & Munn, 1987; Fivush, 1993; Hood & Bloom, 1979; Miller & Sperry, 1987; Scholnick, Hall, Wallner, & Livesey, 1993). The words they learn—words like Mama, cookie, more, cow, up—are words that name the things their feelings are about rather than the feelings themselves. Young children do not have to tell others what it is they are feeling in those moments when they express emotion; the affect display itself is justification for attributing emotion to a child. Once they have a sizable vocabulary, by about 2 years of age, older children begin to learn emotion labels—words like happy, mad, sad—for naming the emotion they are feeling (e.g., Bretherton et al., 1986; Ridgeway, Waters, & Kuczaj, 1985).

When the temporal relationship between speech and affect expression was studied on-line, as they occurred in the stream of children’s everyday activities and play, children were most likely to express emotion immediately after and/or at the same time they were saying words (when measured against their baseline rates of expressing emotion overall) (Bloom & Beckwith, 1989). This was interpreted to mean that the children were learning to talk about those things that were associated with their affective feeling states and, therefore, relevant to them. The two forms of expression converged and were integrated in real time because both were embodiments of aspects of the same intentional state. Similarly, gestures and spoken words have been shown to be closely integrated with each other for both expression and interpretation when children begin to say words in the second year (Morford & Goldin-Meadow, 1992). The temporal convergence of gesture and speech is attributed to children expressing the same mental “computation” (McNeill, 1987).

However, when words were said at the same time children expressed emotion, they tended to be a child’s most frequent and/or earliest learned words—words that are most automatic. The emotion expressed also tended to be positive rather than negative and at low levels of intensity (Bloom & Beckwith, 1989), and most words, in fact, occurred with neutral affect. The less frequent and more recently learned words made up most of the different words the children said. The implication is that neutral affect is recruited when both expressing emotion and saying words make demands on the essentially limited cognitive resources of the young child—such as with high intensity of emotion, negative emotion, and when saying words that are
less well known and automatic. Neutral affect also promotes the states of attention needed for attending to words in order to learn them, and children who spend more time in neutral affect tend to be earlier word learners (Bloom & Capatides, 1987b).

In sum, word learning is intimately connected to a child’s emotional life because infants learn language to talk about and thereby to share the things their feelings are about: the persons, objects, and events that make up the goals and situations that are the causes and circumstances of emotion. But there is also a trade-off between emotional expression and learning and saying words—as indicated by the prevalence of neutral affect among earlier word learners and the tendency for children to be expressing neutral affect when using their relatively infrequent and/or more recently learned words. This collaboration between neutral affect and early word learning represents a conservation of resources for the young child and one of several developments in cognition related to language learning.

Word Learning and Cognitive Development

The relationship between language development and more general developments in cognition has been studied from different perspectives. One perspective stresses the primacy of representations in consciousness—a young child’s intentional states—for all of the child’s actions, including acts of expression and interpretation. In this view, intentional states—what a child’s beliefs, desires, and feelings are about—direct the child to what is relevant in the environment for learning. Another focuses on the mapping relation between the conventional forms of language and a child’s knowledge of objects, events, and relationships in conceptual structure in memory. In this view, it is what the child knows about the world—the knowledge base that both results from and contributes to experience—that determines language learning. Another perspective focuses on development of the processes and structures of thought needed to acquire concepts and world knowledge. And yet a fourth perspective comes from the proposal that children are endowed with a set of principles, constraints, or biases that guide their word learning. Each of these perspectives begins with a different set of theoretical assumptions and, most often, is pursued through different research paradigms.

Intentional States

The assumption of intentionality—that language expresses and articulates the representations in consciousness that are otherwise private and unobservable—is implicit in much research in language acquisition. However, it is rarely made explicit. For example, studies of communicative intent and speech acts (e.g., Bates et al., 1979; Dore, 1975; McShane, 1980; Ninio, 1995a) assume the child has a goal in mind when speaking and uses language to serve that goal. Other theorists and researchers have emphasized the importance of the representations children construct in consciousness for expression and interpretation (i.e., Campbell, 1979, 1986; Golinkoff, 1986; Greenfield, 1980). According to Gopnik (1982), the meanings of children’s relational words (like there, gone, and more), in the single-word period, are directed at the plans they have in mind. They use such words to express something about their goals in relation to their actions and aspects of the context. For example, there expresses the success of a plan; no and gone express failure to attain a goal; more expresses recurrence of a goal or plan, and so forth. In a series of experiments with older, 4-year-old children that took explicit account of the computational demands attributable to underlying plans for sentence processing, certain phrases varied in difficulty for children as a function of their relative cognitive demands rather than their syntactic complexity (Hamburger & Crain, 1987).

The assumptions of intentionality provided the theoretical rationale for the principles of relevance, discrepancy, and elaboration for language development that I have proposed. The results from the study of the convergence of language and affect expression by Bloom and Beckwith (1989) and the study of early object play by Lifter and Bloom (1989) provided support for these principles (Bloom, 1993). In the study of the convergence of affect expression and language described earlier, the two forms of expression were systematically related to each other in real time because each expressed aspects of the same intentional state.

In addition, the study of object play in relation to emerging language in the second year (Lifter & Bloom, 1989, 1997) provided evidence for inferring developments in the content of the representations in consciousness that were expressed by the children’s play. The children progressed from constructing general relationships of containment and support (putting one object onto or into another) to constructing thematic relations that were increasingly specific to the perceptual and culturally relevant properties of the objects (putting a child figure on a horse or feeding a doll with a spoon). The development from general to specific constructions was interpreted as
evidence of the principle of elaboration—intentional states increased in number of elements and the kinds of roles and relationships between elements. Development from general to specific constructions was coextensive with the vocabulary spurt in the children's word learning. Thus, one could infer that cognitive developments taking place in this period of time made it possible for the children to have representations in mind that were increasingly discrepant from what was already available to them in the situation and also increasingly elaborated. Correspondingly, the words they were learning were not just names of things but also names for relations between things and other aspects of events, as has been reported in other studies as well (Bloom, 1973; Gopnik, 1982; Hampson & Nelson, 1993; McCune-Nicolich, 1981; Nelson, 1973; Tomasello & Farrar, 1984). Thus, the children's actions with objects and their words expressed the roles and relationships between elements in their intentional states. In turn, learning words was optimized when the words they heard other persons saying were relevant because they targeted elements, roles, and relations in these intentional state representations.

Subsequent research has now built on our earlier studies of affect and play in an investigation of how language and emotional expression are integrated with each other in relation to children's spontaneous play with objects at the time of the vocabulary spurt (Bloom, Tinker, & Beckwith, 1995). Studying language and play together with emotional expression revealed several mutual effects between them. The episodes in which the children constructed thematic relations between objects in play were treated as target events, in a form of lag sequential analysis, and the incidence of emotional expression and speech during and around the play episodes was compared to their respective base rates of occurrence. The first result was that both forms of expression were generally suppressed relative to baseline, when the children played with the objects. This was interpreted as support for the assumption that aspects of the same intentional state were expressed by the children's play, language, and emotional expression. It was necessary to conserve resources ordinarily expended in such acts of expression when they occurred within the same window of time. The children tended not to talk or express emotion when playing with objects, as has also been reported by others (Margulies & Anisfeld, 1991; Phillips & Sellitto, 1990). The comparison with baseline rates of expression in the study by Bloom et al. (1995), however, gave added weight to this finding.

The second result in this study was a trade-off between the two forms of expression. Although still below baseline levels, emotional expression decreased when speech increased during the play episodes. When the children did say words, they were most likely to be saying them at the time of the actual constructing activity than in the seconds before or after. We interpreted this to mean that their earliest words were closely tied to the representations they were expressing in their actions. This assumption is consistent with the principle of relevance and many reports of young children's dependence on events in the context of their earliest word learning (Anglin, 1977; Barrett, 1986; Bates et al., 1979; Bloom 1973, 1974, 1993; Dore 1983; Greenfield, Reilly, Leaper, & Baker, 1985; Nelson, 1985; Nelson & Lucariello, 1985; Reich, 1976; Werner & Kaplan, 1963).

The children were more likely to express emotion immediately after the episode of play. Thus, as speech increased during the constructing activity, emotion changed in the opposite direction—decreasing during play and then increasing immediately after. This peak in emotional expression immediately after the offset time of a play event is consistent with the similar finding that children were most likely to be expressing emotion in the seconds immediately after saying words (reported in Bloom & Beckwith, 1989). One interpretation of these findings is that mental resources were freed for the cognitive work required for other expressive behaviors such as emotion to occur. In addition, given that most emotion expressed was positive affect, this burst of emotional expression just after a word or just after a construction in play is reminiscent of smiles of recognition (e.g., Sroufe & Waters, 1976), and smiles following mastery (Sroufe & Waters, 1976) or assimilation after "concentrated attention" (Kagan, Lapidus, & Moore, 1978).

In sum, putting two objects together in a thematic relationship was systematically related to saying words and expressing emotion. The moment-to-moment timing of object play, saying words, and expressing emotion in relation to each other showed that these different behaviors competed for a child's essentially limited cognitive and affective resources. Action of one kind might well be inhibited in order to promote action in another (Kahneman, 1973), or resources from one domain might be recruited to complement or facilitate behaviors in another (Bloom et al., 1995). Thus, collaboration between cognition and affect contributes to the developmental processes for language acquisition in the second year. The conclusion from these studies is that language development is intimately
Considerable attention has been given in the child language literature to the importance of cognitive development for building the knowledge base that will inform the content of a child’s language and acquisition of the meanings of words and sentence structures. Hearing words and sentences spoken in relation to an event will be helpful to a child only if at least something about the event is recognized and understood. What a child already knows about the world of persons, objects, events, and relations contributes to the relevance of the words the child hears for learning them. Linguistic and nonlinguistic data from the context become information the child can use for learning language only when they are accessible to the child’s perceptual and cognitive abilities.

A major consequence of introducing meaning into the study of children’s early sentences was to raise the question of where meaning comes from. It wasn’t difficult to see the connection between meanings in early sentences and the cognitive developmental history of the young language-learning child (Bates, 1976; Bloom, 1973; Brown, 1973; and many others since). Many researchers have attempted to document both general and particular relationships between language development and other aspects of cognitive development in the first three years of life—in particular, how children attach the forms of language to what they know about objects, events, and relations in the world (e.g., Bloom, 1970, 1973; Gopnik & Meltzoff, 1987; Ingram, 1978; McCune-Nicolich, 1981; Mervis, 1987; Nelson, 1974, 1985; Nelson & Lucariello, 1985; and many others). The importance of conceptual development for language is, by now, noncontroversial—most simply, children learn language in relation to what they know at least something about.

Conceptual structure, however, does not lead to language in any simple way. Some aspects of language might be acquired along with their corresponding concepts, and children have many concepts without also knowing the language for them. Moreover, some aspects of the meanings of words might be acquired relatively quickly in a fast mapping, but the meanings of most words and of the syntactic structures of a language will need to be worked out tediously over months or even years—the distinction between “fast mappings and slow, extended mappings” (Carey, 1978, p. 291; see also, Anglin, 1993; Bloom & Lahey, 1978; Bowerman, 1981).

Children’s earliest concepts of basic-level objects are categories such as dogs, trucks, and cookies, in which instances within a category are highly similar to each other (like oil trucks and moving vans in the category truck) and not at all similar to the instances in other categories (like spaniels and poodles in the category dog); (Anglin, 1977; Lucariello, Kyraatizis, & Nelson, 1992; Mervis, 1987; Mervis & Rosch, 1981). This level is more basic than the superordinate category level (for example, animals, vehicles, or foods) because members of a superordinate category (like cars and ships in the superordinate category of vehicles) are more dissimilar to each other than members of the basic level (different kinds of trucks) (Rosch & Mervis, 1975; Rosch, Mervis, Gray, Johnson, & Boyes-Braem, 1976). By 16 months of age, children may begin to appreciate distinctions captured by superordinate and contextual groupings (Mandler, Ch. 6, this Volume; Mandler & Bauer, 1988; Mandler, Fivush, & Reznick, 1987; Woodward & Markman, Ch. 8, this Volume). However, the ability to fully and reliably appreciate that items belong to the same superordinate category when they are not perceptually similar (like ships and cars in the category vehicle) does not appear to develop until some time between 4 and 7 years of age (Golinkoff et al., 1995; Lucariello, Kyraatizis, & Nelson, 1992). Learning the full extent of the meaning of words that name superordinate categories is a relatively late achievement.

Concept development is closely connected to a child’s emerging theories about the world—both general theories, like theories of objects, space, time, and causality, and more circumscribed theories that depend on these general theories, like theories of biology and kinship. Concepts are embedded in networks of associations and beliefs. This fact means that there is no simple one-to-one mapping between words and corresponding items in conceptual structure (Keil, 1989, 1991). Instead, words are learned from the complicated interplay between associations with different circumstances of use and how children experience those circumstances in relation to their developing theories about the world.

The contextualization of concepts within conceptual structure and more general theories about the world highlights the importance of relationships—learning about relations between things (and between persons and things) is inherent in acquiring object concepts as well as concepts of relationships. Relational concepts like movement, location, containment, and support have importance far beyond the literal word-to-concept mappings for
particular words like in and on. Rather, relational concepts provide the cognitive underpinnings for many of the grammatical properties of language (Bloom, 1973; 1981; Jackendoff, 1983, 1991; Slobin, 1985), however differently they may be realized in different languages (Bowerman, 1989). The words children learn name the objects and persons that are the participants in a relationship, words like Mama, truck, juice, girl, and the actions, states, or locative directions that define the relationship, words like up, open, and eat. Children eventually learn a grammar with procedures for combining relationships between more abstract linguistic categories to express increasingly abstract conceptual relationships.

**Processes and Structures of Thought**

Other research into cognition and early language development has centered on the development of more general theories or structures of thought. These studies were influenced originally by Piaget's description of sensorimotor cognition in the first year of life—in particular, an appreciation for relationships between means and ends and the permanence of objects in spite of their transformations in space and time (Piaget, 1954). More recent research and theory in infant cognition has challenged the notion of sensorimotor thought and sought to show infants capable of mental representation at younger ages than Piaget had suggested (e.g., Cohen, 1988; Fischer, 1980; Leslie, 1988; Mandler, 1988, Ch. 6, this Volume; Spelke, 1988, 1991). A challenge was also leveled at the idea that processes of thought are ever characterized by such notions as permanence and constancy (Thelen & Smith, 1994). However, for Piaget, "complex structures or 'configurations' in the infant's sensori-motor intelligence, [are] far from being static and non-historical, [rather] they constitute 'schemata' which grow out of one another by means of successive differentiations and integrations" (Piaget, 1960, p. 66). Piaget's theory was not the static one that has often been painted for him (Bloom, Lifter, & Broughton, 1985; Halford, 1989).

Early suggestions were that the connection between developments in infant cognition and early language was a serial one, with language depending on developments in thought, or that they developed in parallel (e.g., Bates, 1976; Bloom, 1970, 1973; Brown, 1973; Ingram, 1978, Nelson, 1974; Sinclair, 1970). Many studies have since compared developments in thought and language in the second year using ordinal scales to measure sensorimotor development, most often the instrument developed by Uzgiris and Hunt (1975). The results of these studies have been mixed. The beginning and end of Piaget's last sensorimotor Stage 6, as measured by scale performance, coincides with the beginning and end of the single-word period in language (e.g., Bates et al., 1979; Corrigan, 1978; Lifter & Bloom, 1989, 1997). Although other global measures of language do not correlate with scale performance, more narrow and specific aspects of early language—such as the appearance of particular words—do correspond with specific object permanence tasks (e.g., Bates et al., 1979; Gopnik, 1984; Gopnik & Meltzoff, 1987; McCune-Nicolich, 1981; Menn & Hazolkorn, 1977; Smolak & Levine, 1984; Tomasello & Farrar, 1984).

The search for correspondences between developments in language and other aspects of cognition has focused on explaining the three early achievements in language: first words at the beginning of the single-word period, a vocabulary spurt toward the end of the single-word period, and the beginning of simple sentences. The evidence from a number of sources suggests that qualitative differences in an infant's capacities for thought are responsible for the quantitative changes captured by an increase in vocabulary (as suggested originally by Bloom, 1973). For example, a vocabulary spurt and children's naming abilities are related to development of corresponding concepts (Lucariello, 1987a), developments in representational capacities for constructing different kinds of thematic relationships between objects in play (Lifter & Bloom, 1989, 1997), and the ability to sort objects into categories (Gopnik & Meltzoff, 1987, 1992; Poulin-Dubois & Graham, 1994; Poulin-Dubois, Graham, & Sippola, 1994–1995)—although individual differences in such sorting tasks have also been reported (Shore, Dixon, & Bauer, 1995). The vocabulary spurt is also coextensive with a sharp increase in the number of different pragmatic intentions or communicative acts that can be attributed to a child's use of single-words (Ninio, 1995a; Venezia, 1992).

In turn, a vocabulary spurt is itself, one of several developments cited as evidence of major cognitive changes at the end of the second year (e.g., Fischer, Pipp, & Bullock, 1984; Kagan, 1981; Langer, 1980).

Children's spontaneous play has often been used as a window on developments in cognition and has yielded a number of insights into the underlying cognitive changes taking place during the same time period in which children begin to learn words, acquire a working vocabulary, and approach the transition to multi-word speech and simple sentences. Piaget (1962) proposed that developments
in the symbolic capacity and the ability to mentally represent a relationship between a signifier and what it signifies contributed to developments in both language and play. Many subsequent studies have provided evidence of young children’s symbolic thought in the relationship between pretend play, in particular, and progress in word learning (Bates et al., 1979; Corrigan, 1978; McCune-Nicolich, 1981; Smolak & Levine, 1984); and the onset of multi-word speech (McCune, 1995; Shore, O’Connel, & Bates, 1984; see Lifter & Bloom, 1997 for reviews). The consensus has grown that developments in play and language behaviors are related to one another through the relationship of both kinds of behavior to the same underlying developments in cognition, rather than being independent and related only to general maturation (e.g., Bates et al., 1979; Bloom, 1993; Bloom et al., 1985; Lifter & Bloom, 1989, 1997; McCune, 1995; Piaget, 1954; Sinclair, 1970).

While many studies imply a causal influence of cognitive developments on language, or at least imply that they occur in parallel, language also exerts an influence on developments in cognition; the developmental influence between them is mutual. As language is acquired, it has an influence, in turn, on the content and processes of thought (e.g., Gopnik & Choi, 1990; Gopnik & Meltzoff, 1986; Hirsh-Pasek & Golinkoff, 1996; Johnstone, 1985; Lucariello, 1987a; Poulin-Dubois & Graham, 1994; Scholnick & Hall, 1991; Shatz, 1991; Sinclair, 1971; Slobin, 1973; 1985).

A number of recent psycholinguistic studies with infants and young children were brought together and synthesized in a model of developing language comprehension by Hirsh-Pasek and Golinkoff (1996). In the first phase of their model, infants hear the talk that accompanies nonlinguistic events and begin to internalize this acoustic packaging, which helps them to appreciate the boundaries of events and to begin to interpret them. Interpretation develops in the second year of life, from roughly 9 to 24 months, in a second phase of segmentation and linguistic mapping, as children analyze nonlinguistic events into the corresponding objects, actions, and relations named by the words and sentences they hear in those events (see also, Beckwith, 1988). A third phase in the Hirsh-Pasek and Golinkoff model is complex syntactic analysis between 2 and 3 years, and consists of children analyzing the relationships between clauses in the sentences they hear, in the absence of correlated events in the context for understanding. Such developments as these in the reciprocal relationship between linguistic and nonlinguistic analysis presuppose the necessary corresponding developments in both social and conceptual knowledge.

**Principles and Constraints**

An altogether different cognitive perspective for explaining how children learn words is that specific constraints operate within the child to guide word learning. Citing a logical dilemma inherent in the effort to translate words from one language to another, originally posed in a philosophical argument by Quine (1960), the question is asked: How can a child ever know that a word is a word in the first place, with a meaning that has something to do with a particular object, since a new, unknown word the child hears could potentially mean many things? Hearing the word *rabbit*, for instance, how is the child to know that *rabbit* means the whole object and not some part of it (like an ear) or a quality it has (like fuzzy or white) or its action (like hopping)? How is it that the next time a rabbit hops by, and maybe even a brown one at that, the child calls it a “rabbit”? Quine’s translation dilemma is a complex one, but the essential point taken from his argument was that the available data overdetermine the meaning of a word in the situation in which a child hears it. The dilemma was deemed resolved by researchers who proposed that, since so many things present themselves to a young child when someone names an object, the child must be equipped with certain a priori language-specific word learning constraints to guide them in finding the meaning of the word (e.g., Clark, 1987, 1991, 1995; Golinkoff et al., 1995; Hirsh-Pasek, Golinkoff, & Reeves, 1994; Landau, Smith, & Jones, 1988; Markman, 1989, 1992; Markman & Hutchinson, 1984; Woodward & Markman, Ch. 8, this Volume).

Different sorts of principles for word learning have been suggested. Some are quite general and described as pragmatic (e.g., Clark, 1991, 1995); others are perceptual (e.g., Landau, Smith, & Jones, 1988); still others are more linguistically driven (e.g., Landau & Gleitman, 1985; Markman, 1989, 1992). The subsequent literature contains many experimental accounts and much theorizing in efforts to prove or disprove one or another set of principles (see, in particular, reviews by Golinkoff, Mervis, & Hirsh-Pasek, 1994; Golinkoff et al., 1995; Nelson, 1988; and papers in Gelman & Byrnes, 1991). Most of the children in these studies were 3- and 4-year-olds who already knew a vocabulary of words; more recently, attention has turned to experiments in word
learning by 1- and 2-year-old children (described by Woodward & Markman, Ch. 8, this Volume).

Originally, the prevailing theme was that principles for word learning took the form of biases or constraints that are biologically specified and, therefore, innate. Either the principles themselves or the ontological categories on which word meanings are based were attributed to inborn cognitive/linguistic constraints that guide language learning from the beginning (see, for example, Carey, 1982; Clark, 1987; Gathercole, 1987; Gleitman, Gleitman, Landau, & Wanner, 1988; Markman, 1989, 1992; Markman & Hutchinson, 1984; Newport, 1981; Soja, Carey, & Spelke, 1991). This view was, at least tacitly, a continuation of the innatist argument from syntactic theory. Chomsky (1959, 1965) pointed out that a child acquires the rules of a grammar despite the fact that these rules are not given in the input the child receives; he concluded that certain grammatical principles must, therefore, be a part of the child’s biological endowment. However, for grammar, the argument for innateness is based on the fact that children do not experience what it is they must learn (a grammar) in their everyday interactions—this is the “poverty of the stimulus” argument. In contrast, the problem for word learning is altogether different. Here a child is supposedly presented with too much information in the situation and needs to be guided in narrowing the range of options to know what is important for the meaning of a word. Principles for word learning were invoked to provide that guidance.

More recent claims have been decidedly muted with respect to innateness, with a growing consensus that principles evolve with development at the same time they guide word learning. They appear sequentially and change as children grow older (Golinkoff et al., 1994; Golinkoff et al., 1995; Merriman, 1991; Merriman & Bowman, 1989). However, if such principles appear as children acquire a vocabulary, they more appropriately describe what it is that children are learning than explain how that learning takes place. Language learning and, in particular, principles for word learning could, therefore, be attributable to more general perceptual and learning strategies rather than being necessarily and specifically linguistic, that is, lexical principles, per se (e.g., Bloom, 1993; Braine, 1974; Dent, 1990; Falmagne, 1992; Freyd, 1983; Markman, 1992; Newport, 1981; Scholnick, 1990; Shatz, 1981; Tomasello, 1992c).

Several criticisms of the lexical principles paradigm have appeared and many of these are discussed and responded to by Woodward and Markman (Ch. 8, this Volume). One issue that does not seem to have been raised, however, is that experiments to test the principles typically present words and objects to children in isolation—from both the nonlinguistic contexts of the events in which objects are ordinarily embedded, and the linguistic contexts of sentences and discourse in which words are ordinarily embedded.

Experimental materials in most studies of lexical constraints and principles are objects and nouns in which one or another variable is manipulated—such as shape or texture, or category versus thematic relationship—but typically in isolation from the events in which children ordinarily experience, learn, and use such words. However, children hardly ever experience objects in isolation, much less learn words for them in isolation from other words and concepts. Rather, from earliest infancy, they hear and learn words that are richly contextualized—both linguistically and nonlinguistically. Results from studies of early speech perception have shown how infants and young children learn to perceive words embedded in the envelope of syntactic, prosodic, and semantic cues to their meanings (see the papers in Morgan & Demuth, 1996).

Moreover, presenting objects and the names for them in isolation separates object names and the concepts they represent from their inherent connections to other concepts in conceptual structure (e.g., Keil, 1991; Medin & Wattenmaker, 1987) and ignores the importance of event-based learning (e.g., Lucariello & Nelson, 1987; Nelson 1986). Such experiments are reminiscent of the earlier studies of children’s comprehension of the syntactic structure of sentences and early studies of memory, in which sentences or words were presented to children stripped of the relevant circumstances and contexts in which they are ordinarily experienced (see, for example, discussion by Bloom, 1973, 1974; Bloom & Lahey, 1978). However, attention to meaning and context is now virtually taken for granted in studies of memory and syntactic understanding.

The principles and constraints on word learning offered so far are typically object specific, having to do only with how children learn names for things. Important examples are the Whole Object Assumption (Markman, 1989, 1992) and the Principle of Object Scope (Golinkoff et al., 1994, 1995): On hearing a new word, a child will assume it names a whole object rather than a part of the object, one of its properties, or something related to it. Historically, most studies of word learning have focused on object names; for example, Brown (1958) and MacNamara (1982), for several reasons. For one, object names are the largest class of
words in the adult language and in some early vocabularies as well. For another, they are relatively easy to study experimentally (Merriman & Tomasello, 1995).

However, we also know that children are learning different kinds of words—not just object names and, for many 1-year-olds, more than half the different words they know are not object names (e.g., Bates, Bretherton, & Snyder, 1988; Bates et al., 1994; Bates et al., 1995; Bloom, 1973; Bloom et al., 1993; Fenson et al., 1994; Gopnik, 1982, 1988a; Gopnik, Choi, & Baumberger, 1996; Hampson, 1989; Hampson & Nelson, 1993; Lieven, Pine, & Barnes, 1992; McCarthy, 1930; McCune-Nicolich, 1981; Nelson 1973; Pine, 1992; Tardiff, 1993). Even in the original study by Nelson (1973), in which more than half of some children's vocabularies were nominal forms, these were not necessarily object names but included nominals that named events like lunch, or nonobject things like lap (Nelson, Hampson, & Shaw, 1993).

When considering word tokens (all the instances of words in a child's running speech—an index of how important the word is for the child in everyday use), object names comprised only one-third of the more than 11,000 tokens said by the 1-year-olds in the study by Bloom et al. (1993). This result is consistent with the relative frequency of object names in the speech these children heard from their mothers in the same observation sessions (Beckwith, Tinker, & Bloom, 1995). In turn, the distribution of nouns in both the child and mother's speech was remarkably similar to results from analyses of a variety of written and spoken texts, from both adults and children, which show that common nouns make up about 37% of all word tokens (Hudson, 1994). It doesn't seem to matter, evidently, whether one is sampling the words used in adult or child texts, or in written or spoken texts, the relative frequency of common nouns is less than 40%. It is not at all clear why this should be. However, the message is clear enough—object names do not predominate among the everyday texts of either spoken or written discourse. Whatever differences are reported in early vocabularies, depending on different methods for obtaining the data, they can be expected to eventually disappear.

The focus on learning object names also separates the acquisition of the lexicon from acquiring all other aspects of language, particularly the grammar. Grammar is inherently relational in that its function is to specify the relationships within and between states and events—which include objects. Words such as more, up, on name relationships to things, and relational words figure prominently in most English-speaking children's single-word vocabularies before syntax. Verbs, which are quintessentially relational, increase in frequency and number toward the end of the single-word period in anticipation of the transition to syntax (e.g., Bates, Bretherton, & Snyder, 1988; Bloom, 1973; Bloom et al., 1993; Gentner, 1982; Tomasello, 1992b). Thus, acquiring the structures of language goes hand in hand with learning the words of the language and verbs in particular (e.g., Bloom, 1981, 1991; Bloom et al., 1975a, 1975b; Pinker, 1984, 1989). Thus, both the early relational words and later verbs are central for constructing syntactic categories or "parts-of-speech."

In response to these and other criticisms, Markman (1992), Golinkoff et al. (1994), and Woodward and Markman (Ch. 8, this Volume), proposed that children would have to override the whole object assumption in order to learn the many words that do not name objects—for example, the relational words like more, down, open common to many young vocabularies. However, it is not at all clear what it would take to override object-specific lexical principles, and the circumstances in which they might be overridden have yet to be identified (Bloom, 1993; Bloom et al., 1993; Tomasello & Akhtar, 1995; Tomasello & Kruger, 1992). The claim is sometimes made that one or another principle could also account for learning other kinds of words (Golinkoff, Hirsh-Pasek, Mervis, Frawley, & Parillo, 1995). So far, this proposal has been empirically tested with older, 2- and 4-year-olds learning novel verbs for novel actions, with mixed results (Merriman, Marazita, & Jarvis, 1993, 1995).

One thing is clear. If many or most of the words children acquire, and most of the words they use in their running speech, are not names of objects, then object-specific lexical principles cannot be responsible for word learning. More general principles are required to explain how a child will learn any kind of word and not just object words, such as the principle of relevance (Bloom, 1993). In the intentionality model of language development that I've proposed, observations of children learning language in everyday contexts—children's actual behaviors—are taken to be more compelling for guiding both theory and research than logical arguments in philosophical theory. The principle of relevance is a generalization about the relationship between the contents of a child's mind—the here and now representations in consciousness—and the child's context. Children surely hear many words that are not relevant to what they have in mind—words in speech that they overhear as well as speech directed to them about things they neither care nor know about. But the words they will learn
are those that are relevant to the things (persons, objects, events, actions, states, relationships) they do care and know about.

Words new to the child could theoretically mean many things in the situations in which they hear them—but only theoretically. How is the child to know that rabbit does not mean hop, ears, tail, furry, or any one of the things it could mean? When the child sees a second rabbit hop by and hears more, why should the word more mean something other than rabbit? The answer is that the principle of relevance narrows the range of possible meanings an utterance could have when the child hears it. Relevance in such word learning scenarios is determined by three things. One is conceptual structure in the knowledge base and the concepts the child is also learning—concepts of objects like rabbits and relations like recurrence. As already discussed, children more readily learn words that name something they know or are learning about (e.g., Lucariello, 1987a). The second determiner of relevance is the child’s perception and focus of attention (e.g., Tomasello, 1988). If the focus is on the whole object, then that is what the child will take the word rabbit to mean. But if the focus is the rabbit’s ears, then the child will assume the word rabbit means ears until persuaded otherwise when, in another situation, the focus is not on the ears but on the object, and the child hears rabbit again. The third determiner of relevance is the child’s engagement in whatever is the focus of attention. The extent to which a child finds a task interesting will determine the level of engagement that the child brings to the task (Renninger, 1990; Renninger & Wozniak, 1985). Interest and engagement are the affective component of relevance (Bloom et al., 1995).

Similarly, hearing the word rabbit on several different occasions when rabbits are present, the child’s focus may be on the ears, the tail, the fur, or hopping, but what all these experiences have in common each time is the whole object and the same word, rabbit. Frequency counts; children may well learn something about a word’s meaning on a single encounter and perform a fast mapping—which is really only a first approximation of the word’s meaning. Most often, however, many encounters are needed to consolidate learning—for both words (e.g., Harris, 1992; Oviatt, 1980, 1982) and syntactic frames (e.g., Beckwith, 1988).

The fact is that children do not learn words in isolation. They perform a distributional analysis in which each new experience with a word is analyzed in relation to prior experiences of the word in memory. The words stored in memory, with the circumstances in which they were experienced, are data for the child—data accumulated after hearing the same word in several or many different contexts. For example, hearing more in such perceptually different situations as another rabbit, another cookie, another glass of milk, the child comes to appreciate the factors—notably the fact of recurrence—which guide the distribution of more in these otherwise different events (see discussions of the part played by distributional learning for syntax acquisition in, for example, Beckwith, 1988; Bloom, 1991; Bloom et al., 1975a; Braine, 1963a; Maratsos & Chalkley, 1980).

An appropriate analogy is the frequent claim that adult sentences could, theoretically, have several interpretations. When hearing a sentence, however, a listener need not run through and consider all of its possible interpretations until hitting on the right one. Rather, the listener sets up an intentional state configuration for representing what the speaker might mean based on what is already available at that point in the discourse and known between them. “There will of course be choices and strategies, but the potential of a sentence, given a previous configuration, is always far less than its general potential for all possible configurations. (A brick could theoretically occupy any position in a wall, but at any stage of the actual building process, there is only one place for it to go.)” (Fauconnier, 1985, pp. 168–9, emphasis added). Like Fauconnier’s brick, the word a child hears could theoretically mean any of a number of things. But, in enough situations in which the child hears it, the options are already greatly diminished by the configuration represented in the child’s intentional state, and the word, like the brick, finds its target.

While not explanatory, the lexical principles or constraints on word learning that have been proposed are descriptive of children’s behaviors as they learn words and acquire a vocabulary. And they are language-specific because it is language learning they describe. Two-year-old children do what the principles say they do: make reference, extend words to new exemplars, label objects that form basic level categories, and so forth. Learning a language means to acquire this sort of specific knowledge, and as such knowledge is acquired, it is used in the service of learning more about the language. Having learned a lexical principle by learning something about what words are and what they do, a child would be expected to use the principle to learn other words. Thus, if lexical principles are part of a child’s cognition for word learning, they are more likely the result of learning words, rather than the starting point.
Two-year-olds perform as they do on experimental word-learning tasks because of what they already know from two years’ worth of learning. Other aspects of cognitive and affective development in addition to language learning in this period of time guide a child’s appreciation for the relevance of a wide variety of cues to a word’s meaning (Bloom, 1993; Bloom et al., 1993; Nelson, 1988; Tomasello, 1992a; Tomasello & Akhtar, 1995). This fact is beginning to be recognized by supporters of constraints theories (e.g., Hirsh-Pasek & Golinkoff, 1996; Woodward & Markman, this volume). By now, a large number of studies have shown how children exploit a wide variety of cues for detecting what is relevant in the speech they hear. These include linguistic properties of the adult’s speech such as its prosody (e.g., Echols & Newport, 1992; Fernald & Mazzie, 1991), morphology (e.g. Anglin, 1993), syntax (e.g., 1994, P. Bloom & Kelemen, 1995; Brown, 1957; Fernald & McRoberts, 1996; Gathercole, Cramer, Somerville, & op de Haar, 1995; Katz, Baker, & MacNamara, 1974), and combinations of these cues (e.g., Gerken, et al., 1994).

These kinds of linguistic cues act together with information about the function of objects (Nelson, 1974) and others, such perceptual properties of objects as their shape or substance (e.g., Baldwin, 1992; Clark, 1973; Gathercole et al., 1995; Imai, Gentner, & Uchida, 1994; Landau, Smith, & Jones, 1988; Merriman, Schuster, & Hager, 1991; Soja, Carey, & Spelke, 1991), and the presence of salient object parts (e.g., Merriman, Scott, & Marazita, 1993; Poulin-Dubois, 1995). If children are able to learn words by exploiting their own abilities to make use of a rich and wide array of cues to a word’s meaning even in experimental tasks (e.g., Baldwin, 1993a, 1993b), one might well ask why lexical principles are necessary at all. Theories based on lexical principles are less than parsimonious once it is acknowledged that children do indeed make use of all such cues to learn words and that the principles can be overridden, in any event, to learn words that are not object names.

Finally, lexical principles (biases or constraints) imply an essentially passive child, one who is depending on internal mechanism rather than active process in the course of development. Research on lexical principles in the past decade has overlooked other things going on in a young child’s life that contribute to the child’s active engagement in word learning. Young children exploit their internal resources and take the lead in providing a rich array of cues to their intentionality—including the other words that they already know—so that other persons can make attributions of what they have in mind. Interested others are sensitive to these cues and tune into the child’s focus of attention to supply information for word learning. Thus, word learning is the product of the active mind of the child, striving to find words to express the representations in intentional states, and the social and pragmatic contexts and activities of everyday living that will yield the words of the language.

Word Learning and Social Context

Language is inherently social because it has to be learned from other persons. Even learnability theory, which depends on adult linguistic theory, requires triggering encounters with appropriate language exemplars in the input children receive (e.g., Gibson & Wexler, 1994; Roeper, 1982). However, this is only the most narrow construal of the part played by contextual factors in development. In contrast, the strong version of a social theory of language acquisition assumes that the interaction between the caregiver and child is primary, with responsibility resting largely on the adult in the situation for setting up and guiding language learning. The origins of the theory are in the work of Vygotsky (1962, 1978), but its strongest contemporary proponents have been influenced by the more recent work of Bruner (1975a, 1983). Bruner suggested that a Language Acquisition Device, an innate linguistic mechanism for acquiring a grammar such as Chomsky (1965) proposed, could only operate successfully with an assist from a corresponding Language Acquisition Support System provided by caregivers. “In a word, it is the interaction between LAD and LASS that makes it possible for the infant to enter the linguistic community.” The language acquisition support system is “initially under the control of the adult” who controls the transactional format within which language is learned (Bruner, 1983, p. 19).

Early formulations of the social basis for language learning emphasized the part played by adults who are in charge of their interactions with children. Support for social theories of language acquisition came from observing children and adults interacting in such scripted activities as book reading (Ninio & Bruner, 1978; Snow & Goldfield, 1983), play routines and games such as peek-a-boo (Ratner & Bruner, 1978) or a tea party (Kaye & Charney, 1980), and other routinized, repetitive, rule-governed transactions (Ninio & Wheeler, 1984) or what Bruner called formats.

More recent accounts broadened the base of socially mediated theories by invoking the pragmatic factors
entailed when adult and child negotiate the activities of daily living (e.g., Becker, 1990, 1994; Nelson, 1985, 1988; Ninio, 1995a; Ninio & Snow, 1988, 1996; Snow, 1989; Tomasello, 1992a; Tomasello & Akhtar, 1995). Developments in children's social cognition enable them to detect and pick up on a variety of pragmatic cues from the socio-cultural context for learning word meaning (e.g., Akhtar, Carpenter, & Tomasello, 1996; Greenfield, 1982; Zukow, 1990, 1991). The result is a "social-pragmatic theory of language acquisition" according to which "young children can learn new pieces of language only by entering into some type of joint attentional focus with a mature language user" (Tomasello & Akhtar, 1995, p. 201). However, this assumption underestimates the opportunities children have for learning from the speech they overhear in conversations between other persons.

Optimum occasions for language learning do occur when accompanying adult speech is about the child's focus of attention, as predicted by the principle of relevance. Mothers tend to be responsive to their children's vocalizations and efforts at speech—usually responding within the first two seconds (e.g., Bloom et al., 1996; Roth, 1987; van der Stelt, 1993). Such observational data have now been complemented by a growing number of experimental studies which document the particular ostensive-inferential cues (Sperber & Wilson, 1986) children exploit for learning words in their interactions, including, for example, the direction of the adult's gaze (Baldwin, 1993a, 1993b; Tomasello & Akhtar, 1995) and the adult's affect expressions of glee or disappointment when finding or not finding an object (Tomasello & Barton, 1994). Woodward and Markman (Ch. 8, this Volume) provide a thorough review of this research and suggest that this account gives more credit to the adult rather than the child for word learning. However, their suggestion overlooks the fact that it is the child's intentional state that determines joint attention more often than not, as children invariably take the lead in their everyday conversations with adults (Bloom et al., 1996; Harris, 1992; Howe, 1981) and in their play activities as well (Bloom et al., 1995). Adults were more apt to initiate talk about distant past events in a study with 1-year-old Swiss French-speaking children, but the children initiated the majority of talk about immediate past events (Venezia & Sinclair, 1995). Mothers talk more and have longer conversations when their children talk more themselves and talk more often about the mothers' topic of conversation (Hoff-Ginsberg, 1994).

Mothers typically tune into and follow a child's lead in their typical interactions in the course of ordinary activities of daily living. The studies cited earlier in support of strong socially-based explanations of language acquisition were largely studies of picture book reading, scriptlike play such as a tea party, or direct instruction—activities in which mothers could be expected to take charge and be more directive. However, such highly formatted activities, in fact, make up only a small part of what happens between caregivers and young children in the course of a day. In addition, as the results of the study by Lucariello (1987b) would suggest, mothers might well take the lead in interacting with a child in the first five or ten minutes of a laboratory session, particularly if the situation is new for the child (as in the study by Kaye & Charney, 1980). In contrast to studies that have looked at interactions in novel or contrived contexts, studies of spontaneous everyday interactions reveal that child and mother contribute to the architecture of the early conversations between them, but, in fact, it is the child who is in charge (Bloom et al., 1995, 1996; Harris, 1992; Howe, 1981).

Mothers can differ in the timing of their response to their infants' behaviors (Roth, 1987) and also in their tendency to name what their infants are attending to. For example, among Caucasians, adolescent mothers are less responsive to their infants than adult mothers and engage in significantly less vocal turn-taking with their 12-month-old infants; their infants, in turn, engage in very little vocal responding (Barrett & Roach, 1995). But children learn more words when their mothers respond promptly to their vocalizations and also say something about the objects of their attention (Akhtar, Dunham, & Dunham, 1991; Harris, 1992; Masur, 1982; Tomasello & Farrar, 1986; see Tomasello, 1988, for review).

However important social cognition is for acquiring language, it must operate together with an understanding of the objective world and the child's affective engagement with persons and objects. Children's thinking is most likely not compartmentalized into thinking about objects and thinking about persons because persons and things typically occur in relation to each other. The same developmental principles and processes are true for knowing about both.

In sum, the social context is crucial for providing the language to be learned, to be sure, but it is no less important for providing opportunities for intersubjectivity and social connectedness to other persons. Together with cognitive developments that drive the principles of relevance, discrepancy, and elaboration, the need to maintain intersubjectivity and to function effectively with other persons
determine that a language will be learned. Societies depend on children to become competent users of the language. In fact, others react less than kindly to children whose communication abilities are more limited than might otherwise be expected for a child’s age (Rice, Hadley, & Alexander, 1993). However, as important as any aspect of the context for language development is, it has influence only when converging with other aspects of development. One by-product of this convergence—and one that has attracted increasing attention—is the fact that children differ in important and systematic ways in the particulars of their language acquisition.

**Individual Differences in Acquiring Vocabulary**

Considerable attention has been given to the ways in which children from essentially the same social and cultural backgrounds differ in their language development. The consensus now is that children vary in onset and rate of learning as well as in the different strategies they use for processing and learning language. (For reviews of individual differences in language acquisition, see Bates, Dale, & Thal, 1995; Nelson, 1981; Shore, 1995; Thal & Bates, 1990.) Children from different economic and social backgrounds also differ, particularly with respect to rate of word learning (Hart & Risley, 1995) and more socially determined, conversational aspects of language (Bloom et al., 1996).

**Rate and Progress in Word Learning**

Children generally differ in when they begin to say words and in their rate of progress in word learning after the first words. As an example, the wide range in the ages of 14 children when they reached three landmarks in language development: first words, a vocabulary spurt, and the beginning of sentences is shown in Figure 7.1. (See Bloom, 1993, for the individual vocabulary growth curves that contributed to these group means and ranges, and the criteria used to identify the three achievements.) The average ages of these children at the times of first words, the vocabulary spurt, and simple sentences were, respectively, about 13, 19, and 24 months. However, the individual children ranged in age from 10 to 17 months of age at first words and from 13 to 25 months at the vocabulary spurt.

The question is sometimes raised whether all children do, indeed, show a vocabulary spurt—a sharp increase in the second year in the number of new words they are learning. Observation of a vocabulary spurt could be susceptible to measurement factors. One contributing factor is the comparison interval used; monthly intervals would be more likely to produce sharp increases than weekly intervals. Another factor is whether one plots a cumulative vocabulary (with all the word types—both old and new words—a child knows) or only the new words learned from one month to the next. A vocabulary spurt is more readily seen in a plot of only the new words learned from month to month and may or may not be apparent in a cumulative vocabulary count.

Smooth, continuous growth curves in vocabulary acquisition have sometimes been reported in studies that used parents’ diary reports or reports in response to vocabulary items on a checklist (see, respectively, Nelson, 1973, and Goldfield & Reznick, 1990). The possibility exists that such variability reflects differences among parents in their observing and reporting skills in keeping a diary or in the accuracy in recall when responding to checklist inventories. Children’s vocabularies grow slowly at first, and all children learning language normally must begin showing an increase in the number of words they learn from month to month, given the dramatic increase in word learning that takes place in the preschool years (Anglin, 1993) and the essential nonlinearity of vocabulary growth curves (Bates & Carnevale, 1993).

Children differ in the onset and development of word learning in the second year for several reasons, and both endogenous and exogenous factors have been described (Bates et al., 1988). For example, one endogenous factor is variation in infant ability to analyze the sound patterns of the speech they hear in relation to their own early sound production patterns (e.g., Goad & Ingram, 1987; Vihman,
A single factor that distinguished between children's everyday experiences with language, with corresponding differences in the outcome for word learning. Children born into poverty have fewer language interactions in their homes and learn fewer words than children born into middle-class families, who, in turn, have fewer interactions and learn fewer words than children born into more affluent, professional homes (Hart & Risley, 1995). Differences in vocabulary size—object labels in particular—was the single factor that distinguished between children from working class and upper-middle-class White families in a study by Hoff-Ginsberg (1994), and economically disadvantaged White children used fewer temporal and causal connectives in their narratives than did middle-class children in a study by Peterson (1994; see also, Hall, Schonick, & Hughes, 1987).

However, language acquisition research and theory have been biased with respect to the children typically studied. Although a great deal of attention is given to research with children learning different languages (Slobin, 1985, 1992, 1997) and learning languages in different international cultural contexts (Ochs & Schieffelin, 1984; Schieffelin & Ochs, 1986), accounts of the acquisition of English—as with studies of development generally—have not typically included children from different socio-cultural contexts (e.g., Bloom, 1975, 1992; Graham, 1992). But there are exceptions (e.g., Blake, 1993; Hall, Schonick, & Hughes, 1987; Hart & Risley, 1995; Heath, 1982, 1983; Miller, 1982; Peterson, 1994; Stockman & Vaughn-Cook, 1982, 1989, 1992; Wells, 1981). Race and ethnicity are typically confounded with socio-economic status in those studies that have included culturally different children. One reason is that a disproportionately large number of African American children, for example, live in poverty in this country, particularly in urban communities.

Affect expression is also associated with differences in onset and rate of word learning. One-year-old children differ in the frequency with which they express emotion, and this difference is independent of the social and cultural differences among them (Bloom, 1993). More emotionally expressive infants tended to begin acquiring words somewhat later than the children who spent more time in neutral affect expression in the study by Bloom and Capatides (1987a). In this same population of children, the frequency of their emotional expressions differed longitudinally from 9 to 21 months of age. The earlier word learners, who began saying words between 10 and 13 months (children in the lower half of the range for first words in Figure 7.1), showed no change from 9 to 21 months in the frequency with which they expressed emotion. However, the later word learners increased in frequency of emotional expression from 9 to 17 months, instead of saying words early. Moreover, the frequency of their emotional expression decreased when they made their move in language toward a vocabulary spurt, between 17 and 21 months.

The direction of influence between affect expression and progress in word learning is not clear, and profiles of development in both kinds of expression could be related to a third factor, such as differences in temperament (Bates et al., 1988; Bloom, 1993). However, it may also be that the emotionality component of temperament is, itself, influenced by progress in other areas of development (Dunn, 1986), such as word learning (Bloom, 1993; Wikstrom & Bloom, 1987). That is, earlier word learning may have a damping effect on emotional expression and, therefore, may be the factor that accounts for diminished emotionality in a temperament profile. This is an area for further research.

Children do not differ only in the onset and rate of progress in word learning. They also differ in the phonological patterning of their early words (Goad & Ingram, 1987; Klein, 1981; Stoel-Gammon & Cooper, 1984; Vihman, 1993). However, this is a topic that is, unfortunately, beyond the scope permitted by the length constraints on this chapter.

The Kinds of Words 1-Year-Olds Learn

Children learn a great many different kinds of words in the single-word period in the second year. However, one thing is clear: As pointed out earlier, children's early words before syntax cannot be reliably classified, from the child's point of view, according to their parts of speech in adult language—as nouns, verbs, adjectives, prepositions, and the like. These kinds of category assignments are only valid once children begin to combine words in sentences,
when linguistic categories can more appropriately be defined on the basis of their distribution in relation to each other and by their semantic and syntactic functions. (This assumption has a long history, beginning at least with McCarthy, 1946. Nevertheless, assigning words to adult parts-of-speech in single-word vocabularies has been used as an heuristic for some analyses, e.g., Bates et al., 1994.)

Other classifications of children's words have been more successful when they are based upon what a child's single words appear to be expressing. Certain words name objects, like ball, cookie, and car; other words name relationships or events, like more, gone, and up. And still other words are parts of social exchanges and routines, like hi, bye, and whee (e.g., Bloom, 1973; Gopnik, 1988a; Nelson, 1973). However, early words do not fall into neat, reliable categories according to either linguistic, conceptual, or pragmatic criteria. Even the common nouns children learn do not form a consistent class, because they name basic level objects like shoe, but also include words like lap, animal, and lunch, which are not names for basic objects (Nelson et al., 1993).

Again, going back to the early words of the 14 children represented in Figure 7.1, we can look at the words they learned in the period between their first words and continuing up to and including the month after their vocabulary spurt. Together, these children said a total of 11,404 words (utterance tokens) in this period in which we observed them in the playroom sessions. However, many of their words were said very frequently; in fact, only 326 different words (utterance types) were said among the more than 11,000 word tokens. The children were not learning the same words. About three fourths of the 326 different words were said by only one, two, or three of the children; only 49 different words (or 15% of all the different words learned by the group) were said by seven or more of the children. And only five words appeared in the vocabularies of all the children. These were the words baby, ball, down, juice, and more (Bloom, 1993). In sum, the diversity among young children in their vocabularies is impressive. Different kinds of words appeared among the vocabularies of seven or more of the children—words like uhoh, hi, boom, on, this, and yum occurred in the vocabularies of seven or more children, along with object names like box, ball, girl, bottle, cookie, juice, and spoon.

Descriptions of early vocabularies tend to differ, however, depending on the methods for studying them. Observational studies in which a sample of speech is used to determine the different kinds of words children use (e.g., Bloom, 1973; Bloom et al., 1993; Lieven, Pine, & Barnes, 1992) tend to report a lower proportion of object names than studies based on mother report measures (diaries or checklists), which report relatively more nouns. Differences between the results of mothers' reports and observational studies have been reported by, for example, Bates, Bretherton, and Snyder (1988), Gopnik (1988a), and Pine (1992).

Results from studies using either direct observation or mothers' checklist report were compared by Pine, Lieven, and Rowland (1996), and they pointed out that each method is responsive to a different research question. On the one hand, scores from a checklist, such as the MacArthur Communicative Development Inventory created by Bates and her colleagues (e.g., Bates et al., 1994; Fenson et al., 1994), are "only really meaningful in an individual differences context (i.e., as indices of [relative] differences in vocabulary size and composition across children)" (Pine et al., 1996, p. 587). On the other hand, detailed observational measures yield more reliable estimates of the absolute proportion of nouns and the distribution of kinds of words in individual vocabularies.

However, observation and mother report are both subject to bias (Pine et al., 1996). Observational data are necessarily restricted to the words used in the particular circumstances that are observed; they may, therefore, be situation-specific. Mother checklist reports are biased, in turn, because (a) nouns are overrepresented on the list relative to other words (Nelson et al., 1993), and (b) mothers are evidently biased to remember and therefore report more nouns than other sorts of words in their children's vocabularies (Pine et al., 1996). In any event, both observational data and mother report data can only provide a sample of the words a child knows, and the source of the sample varies—what mothers pay attention to and remember to report versus the contexts that can be observed by researchers. While data from observational measures are necessarily restricted to words used in the situations that are observed, data from mother report are constrained by inherent differences among mothers in the accuracy of their recall and reporting abilities. Nonetheless, as Pine et al. pointed out, both types of measures sample the words a child knows, and using both methods in the same study (e.g., Bloom et al., 1993) comes closer to the truth.

Children are learning language for interpretation and expression, and the numbers of words and the kinds of words they learn are less important than the kinds of mental meanings expressed by what they say and interpret from
what others say. One-year-old children learn to talk about
the objects, causes, and circumstances of their beliefs, de-
sires, and feelings with the words that say what these are—
words like *Mama, uhoh, no, cow, cookie, more, gone, and
up.* Notably absent from early vocabularies are the words
that name the different emotions like *happy, angry, sad,
scared.* Rather than telling their caregivers which particu-
lar emotion they are feeling, they tell them what their feel-
ings are about and what they might do to either maintain or
change them (Bloom 1975, 1991; Bretherton, Fritz, Zahn-Wexler, & Ridgeway, 1986). The words they say, and
also presumably learn in the first place, are relevant to
what they have in mind—the objects of their beliefs, de-
sires, and feelings.

Children’s words in the single-word period change in the
kinds of mental meanings that can be attributed to them
(Bloom, 1994; Bloom et al., 1988). Early words are most
apt to express mental meanings about things already evi-
dent in the context, things that a child sees. However, with
developments—and consistent with the principle of dis-
crepancy—mental meanings increase that are about antici-
pated but imminent events. Consistent with the principle of
elaboration, anticipated mental meanings about actions,
particularly the child’s own actions, also increase toward
the end of the period. Action events entail more than one
element with different roles and relations between them,
such as the agent of the action, the effect that it has, the
path taken by the movement of the action, and so forth.
These more elaborated mental meanings will require that
the child begin to learn verbs, the semantic-syntactic func-
tions of verbs, and still other words that name persons and
things and the relations between them. This development
from expressing mental meanings about things that are al-
ready evident, to meanings about anticipated actions is one
of the precursors to the transition from saying only one
word at a time to beginning to combine words for the first
phrases and simple sentences.

Once something of the language is known, it becomes a
means of learning more about language itself as well as
more about the world. Linguistic assumptions acquired
early in language learning—assumptions the child comes to
as a consequence of learning something of the language—
can be expected to bootstrap subsequent language learning
(Bloom, 1975, 1991). Thus, once a child begins to acquire a
vocabulary, words can facilitate nonlinguistic categoriza-
tion skills, concept formation, and learning other words
(Brown, 1956; Lucariello, 1987a; Markman & Hutchinson,
1984; Poulin-Dubois, 1995; Waxman, 1990). The kinds of
words they know, particularly relational words, can antici-
pate the sorts of word combinations that are among many
children’s early phrases, like “*more cheese, no fit,*” and
“*this a cup.*” In turn, knowing something of the syntax,
whether a child is yet saying combinations of words, can
guide the child in discovering the meanings of new words
(e.g., P. Bloom, 1994; Landau & Gleitman, 1985; Naigles,
1990). Once children know something about the syntax of
sentences with different kinds of verbs, they are able to
learn the meanings of the other verbs that share syntactic
privileges in a category (Bloom, 1981; Bloom et al., 1975a;
Fisher, Hall, Rakowitz, & Gleitman, 1994; Gleitman, 1990;
Landau & Gleitman, 1985; Naigles, 1990; Tomasello,
1992b).

In sum, progress in acquiring a vocabulary and the tran-
sition to multiword speech and simple sentence grammar
are not reducible in any simple way to only one or another
aspect of development. Instead, all aspects of development
come together by the end of the second year—cognitive, af-
fective, social, and linguistic—in pressing a child to ac-
quire more of the language.

**THE SECOND TRANSITION: PHRASES AND SIMPLE SENTENCES**

If language is to keep up with other developments in cogni-
tion, and with emotional and social understanding, the 2-
year-old will need to acquire a grammar with procedures
for sentences. Just as the affect displays of infancy could
not express the mental meanings of the 1-year-old, the
single-words that served the 1-year-old can neither express
nor articulate the more elaborated and discrepant representa-
tions in the desires, beliefs, and feelings of the 2-year-
old. Acquiring a grammar means learning to translate
conceptual categories into linguistic categories for sen-
tences that can express and articulate the roles and rela-
tionships in intentional states. Several theories of the adult
language assume that adult linguistic categories have a con-
ceptual basis (e.g., Bever, 1970; Jackendoff, 1983, 1990;
Lebeaux, 1988), although this claim is also disputed (e.g.,
MacWhinney, 1987; Radford, 1990). Nevertheless, con-
cepts that can be inferred from the semantics of children’s
early words and sentences—movement and location in par-
cular—have their counterparts in adult semantic theories
(Jackendoff, 1990; Lakoff, 1994). Although the details of
the translation process from early child concepts to the
nascent linguistic categories of early child grammars are
still not agreed upon and remain to be worked out, we can point to several developments that contribute to the process.

By now, few would dispute the importance of meaning for children's early grammatical learning (e.g., Bloom, 1970, 1973, 1991; Braine, 1994; Brown, 1973; Leonard, 1976; Pinker, 1984; Schlesinger, 1971). Along with analyses of the input, what a child has learned about the world that is expressible by language determines how the child learns the semantics of the language for acquiring a grammar. Few would dispute, either, that children greatly expand the scope and frequency of the pragmatics of communication. And the words children already know or are learning, together with developments in cognition and social/pragmatic goals, contribute to acquiring the structures for the earliest phrases and simple sentences.

For many children, the beginning of phrases and the first simple sentences comes soon after a vocabulary spurt near the end of the single-word period. The increase in words expressing mental meanings with imminent actions by the child or the caregiver coincides with an increase in the number of verbs in children's single-word vocabularies (Bloom, 1994; Bloom et al., 1988; Tomasello & Kruger, 1992). Many studies have now converged on the finding that verbs naming actions and events are a relatively late development in the single-word period of English-speaking children and, even more reliably than a general vocabulary spurt, precipitate the transition to phrases and sentences (e.g., Bates, Bretherton, & Snyder, 1988; Bates et al., 1995; Bloom, 1973; Bloom et al., 1993; Gentner, 1982; Goldin-Meadow, Seligman, & Gelman, 1976; Schwartz & Leonard, 1984; Tardiff, 1993, 1999; Tomasello, 1992b; Tomasello & Kruger, 1992; but see Gopnik & Choi, 1990, 1995, and Tardiff, 1993, for exceptions to this general trend in other languages).

Children begin, tentatively at first, to put together words they had already learned to say singly, for example, "more" and "juice" become "more juice." The meaning relations between words in these early two-word sentences are determined by the meanings of their individual words, for example, "more juice" means recurrence because more means recurrence; the meanings of negation (nonexistence, rejection, denial) in little sentences like "no fit" and "no dirty soap" come from the meaning of no. Many observers have commented on the early acquisition of these kinds of word combinations (e.g., Bloom, 1970, 1973; Braine, 1976; Brown, 1973; Leonard, 1976; Tomasello, 1992b). The order of the words in these phrases is typically fixed and consistent with the order in which children hear the words combined with other words in adult speech. Although children are consistent in preserving the order of the words, in fact, the order relationship in such combinations is not necessarily a functional one—it does not indicate a difference in meaning or intent. This is so because the meaning of the phrase is not different from the meanings of the individual words in the phrase added together: "more juice" and "juice more" mean the same thing.

Children also might begin to repeat certain word combinations often heard in familiar routines, like "go byebye," "all gone," and "what's at." Again, the order of the units in these phrases is not a functional one, because the phrases are learned as single words rather than combinations of the separate words as parts. A child might even learn larger phrases as chunks and recall and say these in appropriate circumstances, for example, "I think so," before they have analyzed the phrases into their separate parts and learned how the order of the words determines the meaning relationships between them (Bloom, 1970; Gerken, 1991; Nelson, 1973; Peters, 1977, 1983).

Apart from these early formulas learned as unanalyzed phrases, and word combinations with specific words like no and more and all gone, children learning English need to learn the order of words for expressing meanings that are not themselves inherent in the particular words. The semantics of verbs, in particular, require that a child learn sentence frames with nouns (or pronouns) that express the arguments of the verb, for example, the relation of girl and ball to the verb hit. Young children on the threshold of syntax may grope for the right order of words to express thematic relations in English (Braine, 1976) and try out different orders of words by saying single words successively (Bloom, 1973).

Once mean length of utterance reaches 1.5 words, most of a child's phrases and simple sentences can be expected to show consistent word order in their basic constituents (Bloom, 1970; Brown, 1973). But this consistency can change dramatically as somewhat older children begin to realize that different orders are expected for different functions, and grope, once again, for the order to express more elaborate syntactic structures and the relations between them (Ervin-Tripp, 1980). An example is the following succession of utterances from a 2-year-old child, Kathryn, at mean length of utterance (MLU) = 3.3, as she looked for something to use in pretending to feed two toy lambs: "I going/ I going get some lambs for lunch/ lambs/ lambs for cereal/ I/ I want get some cereal for lambs." Kathryn evidently had a plan in mind, and knew something of the syntax for expressing what she had in mind, but struggled here for the order relations between the phrases "some cereal for lambs" and "some cereal for lunch."
Some researchers have concluded that word order is all that children learn with their first phrases, and the “earliest word combinations reflect nothing more or less than an ordering preference following adult models” (Tomasello, 1992b, p. 226), a view anticipated by Braine’s (1976) “limited scope formulae,” in which children learn the positions of particular words. Others have credited children with more syntactic knowledge, citing the meaning relations expressed by the order of words, to attribute nascent linguistic categories like subject and predicate. For example, the standard theory of generative transformational grammar (Chomsky, 1965) was used by Bloom (1970) as a heuristic for attributing formal relationships to the functional meaning relations expressed in sentences (whether the verb itself was actually said)—the little sentences children typically say like “Mommy pigtail,” “read book,” “Baby do it,” “this go there.” And still others assume that word order is functional from the beginning because children start out with an innate schema for the basic syntax of sentences, which guides acquisition (e.g., Gleitman, 1990; Landau & Gleitman, 1985; Pinker, 1984, 1989).

How to explain the transition to multiword speech and acquisition of linguistic categories like noun phrase and verb phrase is, perhaps, the single most disputed issue in the study of language development. Several different classes of theories have been offered, and they invoke different mechanisms. Those who have paid close attention to the social context point out that the function language serves in different settings can be the source of information about the syntax of sentences (e.g., Ervin-Tripp, 1973, 1980; Ninio, 1995a, 1995b; Ninio & Snow, 1996). Another class of theories emphasizes basic, general cognitive abilities, like being able to perceive patterns and correlations between the units of language that regularly go together, from an analysis of the ways units are distributed in the speech a child hears (e.g., Braine, 1963a, 1987, 1992; Maratsos, 1982; Maratsos & Chalkley, 1980; Olguin & Tomasello, 1993; Tomasello, 1992b). Such proposals were anticipated by Slobin’s cognitive prerequisites and operating principles for grammatical development. An example is the principle “pay attention to the ends of words” in order to learn that “for any given semantic notion, grammatical realizations in the form of suffixes and postpositions will be acquired earlier than realizations in the form of prefixes or prepositions” (Slobin, 1973, p. 192).

Even more basic than such capacities for processing the distribution of linguistic units in the input is Braine’s (1987, 1992) proposal that the “distinction between a predicate and its arguments [is] a primitive [logical] notion that is within the child’s cognitive competence at the outset of language acquisition” and guides analysis of the input for acquiring linguistic categories (Braine, 1987, p. 85). And yet another class of theories holds that linguistic categories are, themselves, the primitives; they are innately determined and guide the acquisition of grammar from the beginning (following Chomsky, 1965, 1986), for example, P. Bloom (1990b), Gleitman (1981, 1990), Gleitman and Gillette (1995), Landau and Gleitman (1985), and Pinker (1984, 1994). Different sorts of data are cited in support of these different kinds of theories, and the issue is a long way from being resolved (see Maratsos, Ch. 9, this Volume).

One aspect of the transition to multiword speech and a grammar for simple sentences is the difference among children in the forms of their early sentences with verbs. These individual differences have been observed repeatedly and cast doubt on the notion that all children are programmed in the same way for making the transition to grammar. Such differences also point to the influence from many other factors, including the cognition of individual experience and the linguistic input children receive in their social interactions.

**Individual Differences in the Transition to Syntax**

Early researchers had been more or less content to describe the beginning of syntax in superficial terms, for example, the increase in length of sentences, different parts of speech, and whether sentences are complete or incomplete, simple, compound, or complex. Differences among children were described in relation to age, gender, socioeconomic status, and birth order, to name a few. These early studies were summarized by McCarthy (1954); the study by Templin (1957) represented the last and most thorough of these “count” studies.

However, the 1960s saw the introduction of generative transformational grammar to linguistic theory, with the proposal that children are learning an abstract, finite system of rules for generating the infinitely many possible sentences in a language (Chomsky, 1957, 1965). The quest was soon joined for discovering the kinds of rules that children learn and how the form of children’s grammars changes over time (in particular, Braine, 1963b; Brown & Bellugi, 1964; Miller & Ervin, 1964). Implicit in Chomsky’s theory and in the research it inspired was the assumption of universality, that all children are learning the same sorts of grammatical rules and in the same way. (See Bloom, 1975; Chapman, 1988; de Villiers & de Villiers, 1985; Golinkoff & Gordon, 1983; Ingram, 1989; and
Maratsos, 1983, for descriptions of this period in the history of child language research.)

The assumption of universality was challenged when the early grammars of the three children studied by Bloom (1970) were shown to differ in a more important way than simply their rate of progress. Two children combined verbs with nouns and also used nouns to indicate possession ("eat meat," "throw ball," "mommy sock"), while the third child combined verbs (or objects of possession) with pronouns (e.g., "eat it," "do this one," "my teddy"). This result "cast some doubt on the view of language development as the same innately preprogrammed behavior for all children...the differences among them must reflect the importance of individual differences in the interaction between cognitive function and experience, which could not be assumed to be the same for any two children" (Bloom, 1970, p. 227).

Subsequent research confirmed this basic finding of differences between pronominal and nominal (or, alternatively, holistic and analytic, or expressive and referential) strategies for early syntax. These studies documented, in particular, the developmental course of this difference after the first word combinations (Bloom et al., 1975b), its relationship to variation in children's single-word vocabularies and what has been called "cognitive style" (Nelson, 1975), the earlier developments in both language and cognition that correlate with the difference (Bates, Bretherton, & Snyder, 1988), and its relationship to differences in the input language children receive from caregivers (Goldfield, 1987; Hampson & Nelson, 1993). See the review by Shore (1995) for further documentation and discussion of these and other studies.

The basic finding is that children differ in whether they begin to combine verbs or objects of possession with nouns or pronouns in early sentences. Regardless of how they start out—whether they are more likely to combine verbs with nouns or with pronouns—the differences eventually diminish, and children become more similar to each other as they acquire more of the grammar. By the time mean sentence length exceeds 2.5 words, sentence subjects (agents, actors, experiencers) are primarily pronominal and predicate objects (the sentence theme or object affected by the action named by a verb) are primarily nominal (Bloom et al., 1975b; see also, P. Bloom, 1990a; Mazuka, Lust, Wakahama, & Snyder, 1995).

Children need to know both nominal and pronominal reference in order to learn the pragmatics of language use and conventions of everyday discourse. Nominal-pronominal variation is a motivated grammatical device for signaling shifting reference according to contingencies in the context and what is already understood between speakers (Jakobson, 1957). For example, whether one says "the bus is coming" or "it's coming" depends on whether the hearer can know what it refers to. At the corner bus stop, "it's coming" will make sense, but might not in another context. Although children differ in whether their early sentences are primarily nominal or primarily pronominal, they eventually learn how to use this variation between nouns and pronouns in order to shift between them to mark differences in the situation or in interpersonal factors in conversations (Garvey, 1979). As another example, by at least 29 months of age, children show sensitivity to the function of subject pronouns for marking the information in a sentence that is given or new (Levinsky & Gerken, 1995).

However, regardless of the strategy they begin with, most children make the transition to multiword speech and learning a grammar for simple sentences some time toward the end of the second year. Acquiring verbs is basic to this transition.

Verbs and Early Syntax

A key question dividing researchers bears on the extent to which children know the basic syntax of the language before they are able to learn verb meanings and the relationships between verbs and other constituents for phrases and simple sentences. At one extreme is the view from adult linguistic theory that children already know the syntax of the language, and knowing the syntax bootstraps verb learning (Gleitman, 1990; Landau & Gleitman, 1985). At the other is the socially-based view that the structures of the language are derived from the formats for acquiring the pragmatics of language use and the conventions of discourse (Dore, 1975; Ervin-Tripp, 1973, 1980; Ninio, 1995a, 1995b; Ninio & Snow, 1996). Between these two positions is the proposal that children construct a grammar of the language in much the same way they construct their other theories about the world—that the transition to syntax and acquiring a grammar is a slow, incremental, constructive process that extends over a period of years and builds on both meaning and function (e.g., Bates & MacWhinney, 1982; Bates et al., 1988; Bloom, 1970, 1991; Bloom et al., 1975a, 1975b; Bowerman, 1976, 1981, 1987; Budwig, 1995; Sinclair, 1989, 1992; Tomasello, 1992b; Venezia, 1992).

The meanings in the majority of early sentences come from categories of verbs that name actions (for example,
do, make, push, eat), and from the thematic roles that nouns and pronouns have as agent (the doer of the action) and theme (the object affected) in relation to those actions (e.g., Blake, 1984; Bloom et al., 1975b; Bowerman, 1973; Leonard, 1976; Miller, 1982; Stockman & Vaughn-Cook, 1989; Weist, 1982). Other kinds of verbs in early sentences name actions that involve a change of place (for example, go, put) with the thematic role of place or path. The importance of children’s theories of objects, movement, and space—theories originating in the cognitive development of early infancy—are evident from the kinds of things caregivers may differ in the extent to which the focus in early caregiver-child interactions is on subjective or objective meanings (Blake, 1993). Young African American mothers and children from low income families tend to negotiate the more subjective aspects of relationships between people, and this interpersonal focus is reflected in relatively early and frequent use of internal state verbs in their early sentences. Mothers and children from mainstream contexts tend to focus more on objects and objective activities in their interactions. The extent to which this difference is true for children from other social-economic backgrounds remains to be determined.

Children’s early verbs include a variety of descriptive verbs like eat, ride, and sing, but, in fact, most descriptive verbs occur relatively infrequently. Instead, children rely on a few all-purpose verbs or “pro-verbs” for many, if not most, early sentences (Bloom, Lifter, & Hafitz, 1980; Bloom, Merkin, & Wooten, 1982; Clark, 1978; Morehead & Moltz, 1973; Rice & Bode, 1993; Watkins, Rice, & Moltz, 1993). Pro-verbs, for example, the transitive action verb do and the intransitive locative verb go, can stand for a great many other more descriptive verbs not yet learned, like draw and drive. Having learned the syntactic frames with pro-verbs, a child can learn other verbs within a category that are more descriptive in their meanings and share the same syntactic privileges (like chew, drink, and eat).

In addition, many of the later-learned more complex structures of the language, like complementation (for example, “I want to do it” or “I see what’s in there”) are learned by children verb-by-verb, or one verb at a time (e.g., Bloom et al., 1980; Bloom et al., 1989; Gordon & Chafetz, 1990; Maratsos, 1979; Tomasello, 1992b). Thus, children learn the syntax of the language first with the all-purpose pro-verbs and a few exemplars of more semantically specific, descriptive verbs. Having learned the syntactic frames in which different categories of verbs appear, a child can go on to learn new descriptive verbs that meet similar semantic and syntactic conditions (e.g., Bloom, 1981, 1991; Bloom et al., 1980).

Verb argument structures, verb inflections, Wh-questions (like what, who, where, and why), and many kinds of complex sentences are learned with the small number of general, all purpose pro-verbs, such as do and go and a few descriptive verb exemplars (see the papers in Bloom, 1991). Children use their knowledge of the syntax of simple sentences to learn more and different verbs, but knowledge of the constituent structure of simple sentences is learned, not innate (e.g., Bates & MacWhinney, 1982; Bloom, 1970, 1991; Bloom et al., 1975a; Budwig, 1995; Tomasello, 1992b). This account is consistent, in part, with the theory of “syntactic bootstrapping” (Gleitman, Landau, & Wanner, 1988; Landau & Gleitman, 1985) which claims that children use their syntactic knowledge to learn the syntax and semantics of other verbs that share the same syntactic functions. According to Landau and Gleitman, however, a syntactic parser is part of the linguistic endowment that the child brings to acquiring a language, and verb learning depends on this innate syntactic ability.

Initial proposals that children are learning structure and syntactic categories for expressing meaning relations were countered with assertions that the available evidence seems to support only semantic and not syntactic knowledge (Bowerman, 1973; Brown, 1973; but see Bowerman, 1987). Most recently, the transition from single words to simple sentences has been attributed to developments in the social-pragmatic uses of the single words children use before syntax by Ninio (1995a, 1995b). Ninio proposed that the increasing number and variability of children’s communicative intents toward the end of the single-word period press them to learn grammatical dependency relations with rules for the permitted combinations of words. However, theories that grant knowledge of only word order, or only semantics, or only pragmatic intentions are basically discontinuous with both later learning and the adult target language in which these things are necessarily integrated. More seriously, however, they ignore the fundamentally necessary convergence of different aspects of language in the course of acquisition. Word order in sentences is never
empty of either meaning or pragmatic intent; pragmatics cannot be independent of meaning. Both meaning and pragmatic intent depend on the formal properties of words, phrases, and sentences.

In sum, children tap into the verb system of the language and learn the sentence structures licensed by different categories of verbs. They may start out by analyzing the roles and relations between verbs like put and nouns like truck for phrases like “put truck,” or they may begin synthetically with whole phrases or chunks, like “put it in” and “I want it” before learning the role relations between the parts. Ultimately, however, learning the argument structure of verbs and their syntactic alternations for realizing different thematic relations is the foundation for acquiring a grammar (e.g., Bates et al., 1988; Bloom, 1981, 1991; Bloom et al., 1975a, 1975b; Gropen, Pinker, Hollander, & Goldberg, 1991; MacWhinney, 1987; Pinker, 1989; Radford, 1990, 1995; Tomasello, 1992b). Many theories now assume that the different verbs children learn determine sentence structures that are continuous with later syntax and the verb system of adult English. Indeed, children learning language slowly or with difficulty have particular problems in learning verbs (e.g., Oetting, Rice, & Swank, 1995).

In contrast to this developmental, constructivist account, theories and research motivated by adult linguistic theory attribute early syntactic ability to innate knowledge of the basic grammatical principles and parameters of language (see Maratsos, Ch. 9, this Volume, for extended discussion). The realization of the innate principles and parameters in acquisition of increasingly complex structure is triggered when children hear relevant exemplars in the speech around them (e.g., Gleitman & Gillette, 1995; Hyams, 1986; Pinker, 1984; Roeper, 1982; Valian, 1991; Wexler, 1994). The difference between these two perspectives on language acquisition—one based on developmental theory and constructivism, with the assumption of more general cognitive principles, and the other based on adult linguistic theory, with the assumption of innate grammatical principles and parameters—is exemplified in two issues concerning two fundamental aspects of early child language: early sentences without subjects, and the acquisition of negation.

Subjectless Sentences

Sentence subjects are required in a grammar of English, but the early sentences of children learning English very often occur without them, for example, “read book,” “ride train,” and “no fit.” Even after a child begins to say sentences with subjects, like “man making muffins” and “this go there,” null-subject sentences continue to occur (Bloom, 1970; Bloom et al., 1975a; Brown, 1973). Several explanations based on adult linguistic theory have been offered (see Borger & Wexler, 1992), in particular, the theory of parameter setting (e.g., Hyams, 1986; Hyams & Wexler, 1993). Whether sentences have subjects is a parameter in universal grammar, in government and binding theory (Chomsky, 1981), but the parameter is set differently in different languages. Parameters in universal grammar have a range of values and a child depends on hearing speech in order to determine the value of a parameter in the particular language the child is learning.

Italian is a language in which sentence subjects are optional; in contrast, they are obligatory in English, which is why children’s null-subject sentences attract attention. The explanation from linguistic theory is that young children learning English have not yet acquired information from the speech they hear to set the parameter for required subjects in sentences. Because they do not yet know that sentence subjects are required in English, they act as children do who are learning Italian. This explanation is a strictly linguistic one, based as it is on the assumptions in government and binding theory, and the hypothesis that subjectless sentences are the early behavioral manifestation of an innate parameter of universal grammar waiting to be set. (See Hyams, 1986, for the original statement and full logic of the theory.)

However, there are several psychologically- and developmentally-based explanations of null-subject sentences in early child speech. These accounts build on the basic observation that very young children are limited in the amount of information they are able to handle at one time. Thus, subjectless sentences occur because of limitations in their production capacities due to a variety of factors. One view is that children omit those syllables that are weakly stressed, such as pronoun sentence subjects, due to limitations in their production capacities for speech (e.g., Gerken, 1991). Others have suggested that omitting sentence subjects is pragmatically motivated: Children drop the least communicative parts of a sentence, and sentence subjects often represent information that is already given in the situation (e.g., Bates, 1976; Braine, 1974; Greenfield & Smith, 1976).

More general limitations on cognitive processing have been suggested by several researchers (e.g., Bloom, 1970; Bloom et al., 1975a; P. Bloom, 1990a; Mazuka, Lust,
Saying sentences makes several demands on a young child's cognitive resources. At the least, a child needs to recall linguistic procedures, structures, and words that lexicalize linguistic categories. A child might need to add syntactic complexity, like attribution (e.g., "I wanna read airplane book") or negation (e.g., "Mommy no make pig-tail"). The child might also need to respond to something someone else has said in conversation. The relative automaticity of words, added syntactic complexity, and conversational demands tap into the child's cognitive processing abilities and compete for the young child's essentially limited resources. This competition means that recalling words that are newly learned and less automatic than well-known words, or adding negation or attribution to a sentence, costs the child, and something has to give. Thus, negative sentences are shorter than affirmative sentences and lack sentence subjects initially, because negation in a sentence costs the child extra cognitive effort (Bloom, 1970; Bloom et al., 1975a; see Bates & MacWhinney, 1987; MacWhinney, 1987 for a related "competition model"). These cognitive requirements interact with what children hear of the particular language they are learning, with the result that the frequency of subjectless sentences differs between children learning English and children learning Italian (e.g., Valian, 1991) or Chinese (Wang, Lillo-Martin, Best, & Levitt, 1992). These cognitive effects are more systematic than such performance effects as fatigue, distractions, and shifts in attention and interest (described by Chomsky, 1965).

Essential to explaining the variability in early sentences is the fact that other factors can facilitate sentence subjects and increase their probability of occurrence, complementing those factors that compete for a child's limited resources (Bloom et al., 1975a). For instance, children are more likely to say longer sentences when the words they use are relatively well known and thus easily recalled. Children are less likely to include a sentence subject when using words that were learned more recently. This "lexical familiarity effect" also influences whether children omit function morphemes, such as the object articles a and the with nouns (Boyle & Gerken, 1997). The frequency of subjectless sentences also depends on the verbs children use and is a function of syntactic role and verb category. Deaf children are more likely to drop subjects with transitive than with intransitive verbs (Feldman, Goldin-Meadow, & Gleitman, 1978; see also, P. Bloom, 1990a). In sum, the occurrence of subjects in early sentences is systematically influenced by a variety of factors that increase or decrease the probability that sentences will be complete or not. Children omit subjects when their cognitive processing abilities are exceeded—for example, when they use new verbs, nouns, or pronouns, or add negation or other kinds of complexity to a sentence, or need to respond to discourse demands that might not be relevant to what they already have in mind.

The two explanations of subjectless sentences, the cognitive load hypothesis and the parameter-setting hypothesis, independently converged on a particular component of the grammar, verb inflections (-ing, -s, -ed). While certain kinds of added complexity, like negation and two-part verbs (i.e., take off) reduced sentence length, adding verb inflections to modulate the meanings of verbs did not influence whether sentence subjects occur (Bloom et al., 1975a). Children were neither more nor less likely to lexicalize subjects when the verb was inflected. Thus, cognitive constraints that influence how much of a sentence a child is able to say interact selectively with aspects of the language being learned. The acquisition of inflections for marking subject-verb agreement is evidently less vulnerable to the general cognitive processing constraints that reduce the length of sentences by omitting subjects, because of: the close dependency between sentence subjects and verb inflections—the bound forms that attach to verbs and nouns for modulating the meaning of simple sentences. A complementary finding was reported by Hyams (1986) in research motivated by her linguistic explanation based on principles of universal grammar. She proposed that children acquire the adult setting for the obligatory subject parameter in English at about the time they also begin to use verb inflection and auxiliaries. Others have also reported that children discover the obligatory subject requirement when they learn inflections for the distinction between tensed and untensed verbs (O'Grady, Peters, & Masterson, 1989). However, in a case study reported by Ingham (1992), the child's subjectless sentences decreased before verb inflections were reliably acquired.
Acquisition of Negation

One of the complexities that causes subject omission is negation, even though negation is one of the earliest meanings that children learn. In the first year of life, infants express negation prelinguistically—typically by shaking the head “no” (Spitz, 1957). The word no to express rejection/refusal is frequent in the single-word speech of many children in the second year. And negation is typically one of the earliest complexities children add to their simple sentences to express meanings such as nonexistence, rejection, refusal, and denial with words such as no, no more, all gone, and, eventually, not, can’t, and don’t (e.g., Bloom, 1970; Choi, 1988; de Villiers & de Villiers, 1979; Gopnik & Meltzoff, 1985; Klima & Bellugi, 1966; Pea, 1980, 1982). With development, the early two-word negative phrases like “no fit,” “no shoe,” “no more juice” (with no more learned as a single word) are embedded in longer sentences to express increasingly elaborated meanings, for example “I don’t want more juice,” “The lamb won’t fit in there,” and “I can’t find a shoe.” Negation continues to show the effects of learning and development through the preschool and school years (e.g., de Boysson-Bardies, 1977; de Villiers, Tager-Flusberg, & Silva, 1976; Hopmann & Maratos, 1978; Klima & Bellugi, 1966).

One issue in the acquisition of negation has surfaced repeatedly since the 1960s and, as with subjectless sentences, has been a key point of debate in deciding between alternative explanations of language and its acquisition. The issue is whether early negation is external to the structure of sentences in a preliminary stage prior to the development of sentence internal negation, as the surface form of early sentences with no might suggest (Klima & Bellugi, 1966), or whether negation is internal to the sentence and attached to the verb in accord with the scope of negative meaning from the beginning (Bloom, 1970). Early negative sentences lack sentence subjects (as already discussed) and typically begin with no, for example, “no fit.” The challenge comes with sentences in which no appears before a sentence subject, for example, “No, Mommy do it,” “No, Kathryn playing self,” and “No, Nathania’s a king.”

The original description of sentence-external negation by Klima and Bellugi (1966) was based on the surface forms of the negative sentences of Adam, Eve, and Sara in the Roger Brown corpus (e.g., Brown, 1973; Brown & Bellugi, 1964). The challenge to external negation by Bloom (1970) was based on an interpretive analysis of sentences with no to determine their meaning and the child’s intent (for example, “No, Kathryn playing self”). That analysis suggested that such sentences were actually affirmative, not negative. The no was anaphoric, meaning that it referred back to negate something either said previously or otherwise explicit in the context. For example, when Kathryn said “No, Kathryn playing self,” she was asserting her intent to play with her own toys and opposing the suggestion that she play with my toys. The no in her sentence was a negation of my prior suggestion. Thus, when sentence subjects occurred with sentence-initial no, the proposition expressed in the sentence was not what was being negated (see also, Bloom, 1991).

When the early negative sentences of Adam, Eve, and Sarah were subsequently reanalyzed with the appropriate interpretive analysis by de Villiers and de Villiers (1979), “very few critical examples existed in which the negative element was nonanaphoric, and the subject was expressed . . . Clearly then, the initial-no negatives do not seem to constitute a universal first step” (de Villiers & de Villiers, 1985, p. 82). Nonetheless, they allowed that individual differences exist, citing data they collected from their son Nicholas, who said many sentences with initial no or not in front of sentence subjects between 23 and 29 months old. However, in all except one instance, the meaning of his sentences was the polite form of rejection and the no was an emphatic. Examples were “No Nathania’s a king” and “no Mummy do it” where the scope of negation is actually an unexpressed first person matrix verb want and “Mummy do it” is its complement sentence. The meaning of such sentences was glossed by de Villiers and de Villiers (1979) as “[I] no [want] Mummy do it,” which anticipated the subsequent acquisition of the polite form of negation “I don’t want S” or “I don’t like S” (where S = sentence).

Kathryn, the child in Bloom’s original study, like Nicholas, also used the complement form with first person matrix subjects (these were null initially, for example, “no want this,” but, eventually, expressed, for example, “I don’t want to comb hairs”). Kathryn also used anaphoric rejection or refusal frequently. The two other children in that study, in contrast, expressed rejection with the second person negative imperative most often (“Don’t touch my block!”). However, these differences among the children probably reflected differences in the ways their caregivers talked to them. From a study of the input sentences in the Brown corpus and in their own recorded utterances to Nicholas, the de Villiers found that differences among children in the use of polite versus imperative forms of rejection corresponded to differences in the negative sentences
the children heard. A complementary analysis of 10 English-speaking children has recently been reported by Drozd (1996), who looked specifically at the discourse context of sentences with *no* before the sentence-subject. He concluded that such sentences as “No Nathanial’s a king” typically echo and negate a previous utterance from someone else. This interpretation is consistent with a function of exclamatory negation in adult discourse, meaning “[Don’t say] ‘Nathanial’s a king!’”

In sum, analyses that took into account the semantic and pragmatic influences on the form of early negative sentences revealed that *no* at the beginning of an utterance is most often a negative sentence with the sentence subject omitted. When the scope of negation is indeed integral to the sentence with *no*, the inclusion of the negative marker results in shorter sentences without sentence subjects. Otherwise, when the sentence includes a subject, *no* at the beginning of the sentence is either an anaphoric, an emphatic, or a form of politeness relative to the larger discourse context.

This conclusion continues to be challenged, however, most recently by Van Valin (1991) and Deprez and Pierce (1993), who used the surface forms of such examples of presentence negation to support several recent proposals in adult grammatical theory. In turn, the analysis of the three children whose speech was studied by Deprez and Pierce has now been challenged in a much more extensive study of the acquisition of negation and the status of children’s early negative sentences by Stromswold (1995). She analyzed the negative utterances from 14 children in the relevant age range in the Child Language Data Exchange Systems (CHILDES) database (MacWhinney & Snow, 1985). In all, she examined over 12,000 sentences with *no* and 4,500 with *not* in relation to auxiliary and main verbs—reanalyzing, in particular, the meanings expressed in the data from the three children cited by Deprez and Pierce. She reported that children rarely used Neg-initial utterances with sentence subjects; the rate of pre-sentential negatives was not only very low, but constant throughout acquisition, indicating that it is not even an early stage. She concluded the results were more consistent with acquisition of sentence-internal negation from the beginning, rather than a switch from a Neg-initial to a Neg-internal strategy. Moreover, children distinguished between two different forms of negation, using *not* for sentential negation and *no* for anaphoric negation and quantification (Stromswold, 1995, pp. 18–19). Thus, early sentences expressing negation are immature and incomplete in critical respects, but, from the beginning, children converge on the

adult structure of syntactic negation to express negative intent in their beliefs, desires, and feelings.

Subjectless sentences and the form and function of negation in early syntax are but two of the issues dividing researchers of language acquisition. They have been presented here as examples of the contrasting theoretical and empirical approaches to child language that have contributed to the theoretical tensions described in the beginning of this chapter. One class of theories begins with a child’s changing behaviors in relation to the larger contexts of the child’s life and invokes other aspects of the child’s development for explaining language development. Other theories invoke adult linguistic theory to explain acquisition and use the data from children learning language to support that theory. Still other aspects of acquisition have been cited as a basis for deciding between competing linguistic theories, such as whether children do (e.g., Deprez & Pierce, 1993; Gerken, 1991; Peters, 1983) or do not (e.g., Radford, 1990, 1995) start out in their earliest word combinations already knowing something of inflections (see Maratsos, Ch. 9, this Volume).

In sum, once children have some understanding and facility with the syntax of simple sentences for expressing the basic semantic relationships between the agents of actions, the objects affected by an action, and the places to which and in which objects are located relative to each other, they begin to enlarge their meanings. At first, the meanings of simple sentences are modified by negation, inflections on nouns and verbs, and procedures for questions (see Bloom, 1991). With increasing sentence length, children also embed the meaning relations expressed by early two-word phrases such as “more juice” and “Mommy juice” in the verb phrase of a simple sentence, for example “get more juice” or “drink Mommy juice” (Brown, Cazden, & Bellugi, 1969).

Acquiring complex sentences, however, is an even more important development between two and three years, and provides yet another major testing ground for the exploration of competing grammatical theories. Acquiring the structures of complex sentences begins in the second year but continues well into the school years. Children need to acquire increasingly complex structures for expressing the more elaborated meanings made possible by their expanding cognitive abilities and increasing knowledge about the world, as predicted by the principle of elaboration. How children acquire the full complexity of the language has been the subject of much of the research that is driven by one or another linguistic theory to explain adult grammar—
research usually conducted with older children (see Maratsos, Ch. 9, this Volume). However, the third transition to the beginning of complex syntax depends on developments in children’s thinking and occurs in the context of complementary developments in their conversational, pragmatic interactions with other persons in the activities of daily living.

THE THIRD TRANSITION: THE BEGINNINGS OF COMPLEX SENTENCES

Earlier in this chapter, considerable attention was given to developments during infancy that inform the later development of language. We saw that cognitive developments beginning in the first year result in learning about persons, objects, actions, and the relations between them. A grammar of simple sentences is acquired in the second year in order to express the thematic relations that have their origins in the knowledge about actions and the agents and recipients of action gained in the first year. Cognitive, affective, and social developments in infancy also include the earliest appreciations for relationships between events, such as one event happening before or after another, or one event being the cause of another event or its consequence. Children learn to express such increasingly elaborated relationships in intentional states—such as time and causality—when they begin to learn the increasingly complex structures of language between 2 and 3 years of age.

By the time they are 2 years old, most children have begun to realize that simple sentences can be related to each other when they are about events and states that happen together with a meaningful connection between them. Children need to acquire the syntax of complex sentences for combining the propositions underlying two simple sentences in order to express and interpret such complex meanings. They also need to learn the syntactic connectives, like and, then, because, so, but, and if, which express these meanings. However, by the time they are 3 years old, children have still only just begun to learn about syntactic connectives and meaning relations between propositions in the complex structures of conjunction, complementation, and relativization. Thus, developments in the complexity of language in the year between ages 2 and 3 can only be described in terms of emergence. Further achievement comes gradually in conjunction with other cognitive, social, and language developments in the preschool years, and development continues into the school years (e.g., Bloom, Lahey, Hood, Lifter, & Fiess, 1980; French, 1988; French & Nelson, 1985; Greenfield & Dent, 1982; Hakuta, de Villiers, & Tager-Flusberg, 1982; Lust & Mervis, 1980; Wing & Scholnick, 1981).

The fact that children’s sentences continue to increase in length is only a surface indication of the underlying developments taking place in their social and cognitive understanding. For example, the concept of causality is one of the critical aspects of both thinking and social connectedness to other persons that is expressed by a child’s complex sentences. An understanding of causal connection between a person who acts and the effects of actions on objects and between objects begins in the first year of life (e.g., Leslie, 1988; Piaget, 1954, 1974). At the same time, developments are also taking place in the child’s relationships with other persons and the conversational exchanges in which they participate. Giving and requesting explanations and reasons are a critical part of achieving interpersonal understanding as well as learning about the objective world. The earliest meanings of causal statements and questions between 2 and 3 have to do with the personal, emotional, or sociocultural beliefs that are the reasons for or results of actions. By the time they are 3 years old, most children have acquired the basic linguistic forms for expression of causality (e.g., Bloom & Capatides, 1987a; Donaldson, 1986; Dunn, 1988; French, 1986, 1988; Hood & Bloom, 1979; Johnson & Chapman, 1980; McCabe & Peterson, 1985).

The meanings of early complex sentences are acquired sequentially, and they are semantically cumulative, which means that they build on each other developmentally. The earliest learned meaning of conjunction is a simple additive relationship when two simple sentences are connected without another meaning relation between them. Children start out by learning the connective and for expressing representations in intentional states in which two events simply go together or happen together. An example is “Maybe you can carry that and I can carry this.” This development has its analog in children’s conceptual development: Understanding that things go together to form collections is an earlier development than learning that things can be ordered in a series or a sequence (e.g., Sinclair, 1970) or classes of things (Markman, 1984).

Complex sentences are soon learned that are additive plus something else: Two events go together but in a particular order relative to each other in time. They express temporal meanings of simultaneity or succession, for example, “I going this way, then come back.” Children learn to express more semantically complex meanings when causality is added to additive and temporal meanings. The meanings of such sentences as “Maybe you can bend him so he can
sit” express a causal connection (he could sit because you bend him) that is necessarily both additive (you bend him and he can sit) and temporal (you have to bend him before he can sit; Bloom et al., 1980; see Brown & Hanlon, 1970, for discussion of cumulative syntactic complexity and Brainerd, 1978, regarding cumulative complexity in cognitive development).

The result is a developmental sequence for acquiring conjunction with simple additive relations expressed before temporal relations, which are, in turn, expressed before causal meanings. The additive, temporal, causal sequence in acquisition of complex sentences with conjunction by 2- and 3-year-olds is echoed in 4- and 5-year-old children’s understanding of the concept of a story and the developmental sequence of storytelling skills (e.g., Stein, 1988). In addition to their semantic meanings, 2-year-old children’s complex sentences also express pragmatic meanings, such as expressions of causality that are requests for action or assistance, prohibitions, cautions, or reasons for a disruption in the order of things (Hood & Bloom, 1979). By the time they are 3 to 4 years old, children are able to express an adversative meaning such as a change of mind or change of focus (Peterson, 1986; see also, Wing & Scholnick, 1981).

Linguistically, children’s earliest complex sentences connect the structures underlying their simple sentences (Bloom et al., 1980; Bloom, Rispoli, Gartner, & Hafitz, 1989; Bowerman, 1979; Limber, 1973). When syntactic connectives are acquired, the first connective is and—in English (e.g., Bloom et al., 1980; Clark, 1970; Limber, 1973) and also in other languages, for example, Swedish (e.g., Johansson & Sjolin, 1975), Japanese (Clancy, 1985), German (e.g., Werner & Kaplan, 1963). (See also, Clancy, Jacobsen, & Silva, 1976.) And is also the most general syntactic connective—used to express conjunction with different meaning relationships (additive, temporal, causal, and adversative) before children learn the semantically more specific connectives for expressing these meanings, such as and then and when for temporal relations, because and so for causal relations, but for adversatives, and if for conditional meaning (e.g., Bloom et al., 1980; Clark, 1970). Moreover, and also functions as a discourse connective, joining clauses and sentences in children’s narratives and their everyday conversations. Well into the school years, and continues to be used ubiquitously as an all-purpose connective for cohesion in discourse—to show that successive sentences are related to each other because they share the same topic (Peterson & McCabe, 1987, 1988).

The earliest connectives learned in English—and, then, and because—are the connectives that do not also have a nonconnective function. Connectives that are homonymous—the same form having two or more meanings in the language—are learned later (Bloom, 1991; see Bever, 1970, for discussion of conceptual constraints on learning syntactically homonymous forms). For example, what, where, and who are first acquired in their non-connective contexts for asking questions (for example, “What doing?” and “Where all the people go?”), before they are learned in complex sentences with complement clauses (for example, “You know what’s in this bag” and “Let’s go see where Mommy is”) or relativization (i.e., “the man who fixes the door”). The word that is learned as a connective with complement clauses (i.e., “I think that he wanna eat this”) at least several months after it appears in children’s speech as a demonstrative pronoun in early phrases like “that a car” (examples from Bloom, 1991). In addition, the three complex sentence structures with connectives learned in this period are learned in this sequence: conjunction before complementation before relativization. The structures of complementation with connectives and relativization are learned after conjunction in part, at least, because they require as connectives those homonymous forms what, where, or that learned earlier in other syntactic contexts.

The structures of conjunction, complementation, and relativization are also learned with different populations of verbs: Conjunction occurs overwhelmingly with action verbs like eat and locative verbs like go, relativization with the copula to be, and complementation primarily with state verbs, notably the perception verbs see and look and the epistemic verbs think and know. Thus, the centrality of verbs for early simple sentences continues in the acquisition of complex sentences. As was the case for verb inflections (Bloom et al., 1980) and Whquestions (Bloom, Merkin, & Wooten, 1982), more complex structures tend to be learned first with only one or two individual verbs as exemplars, such as the pro-verbs do and go, before generalizing across a class or classes of more varied and descriptive verbs like cut and ride (e.g., Bloom, 1981; Maratsos, 1979; Tomasello, 1992b). Examples include the passive construction (Gordon & Chafetz, 1990) and complement clauses and connectives (Bloom et al., 1989). Only gradually do children appreciate that verbs come together to form categories as a function of the structures and aspects of grammatical meaning they share.

Does grammatical development depend on acquiring general rules first and then learning the verbs that fit the rules, or does it depend on induction as a result of learning structures one verb at a time? This question has come up in
a variety of contexts (see de Villiers & de Villiers, 1985). From the perspective of linguistic theory, the basic structure of the grammar is given to begin with, and the syntax of sentences determines the verbs children learn (Gleitman, 1990; Gleitman et al., 1988). From the developmental perspective, children discover the larger grammatical structures of the language through learning how the pieces fit together. Once they've learned a basic structure with a small subset of the possible verbs that can enter into it, they can proceed to learn other verbs also permitted in that structure (Bloom, 1991). Children do not begin syntactic learning with a general category of verb (Tomasello, 1992b).

The different complex sentences also occur in different discourse environments. Early causal questions and statements, for example, are more likely to occur in response to what someone else says than are simple additive expressions or expressions of temporal order (Bloom, Merkin, & Wootten, 1982; Hood & Bloom, 1979). Thus, in addition to the requirements presented by the verbs in the language, requirements for conversational discourse are also a factor in learning increasingly complex structures and uses of language (e.g., Budwig, 1996). Since most research tends to be about developments in either complex sentences or discourse, more research is needed in order to understand the essential developmental relationship between them.

**LEARNING LANGUAGE IN AND FOR CONVERSATIONS**

Participating in conversations provides children with particularly fruitful contexts for the acquisition of complex syntax, as in the case of causality. In turn, children's use of complex sentences in conversation and narratives has provided researchers with insights into the psychological as well as logical meanings they are learning to express (e.g., Bartsch & Wellman, 1995; Falmagne, 1990; Scholnick & Wing, 1991, 1992). However, the direction of influence between syntactic learning and developments in conversation are not easy to establish, and the two kinds of development do not necessarily proceed hand-in-hand. Often, function follows form, and children may acquire the forms of the language and even use those forms in more or less relevant and appropriate contexts without learning all the details of their functions.

Acquisition of the capacity to use both nouns and pronouns for shifting reference in sentences is an early example of function following form in conversational development. Individual children start out using either nouns or pronouns primarily, but all children eventually learn to refer to a car as *it* or *car*, to a place as *there* or *floor*, and express possession with a proper noun *Kathryn's*, or a possessive pronoun, *my* (e.g., Bates, Bretherton, & Snyder, 1988; Bloom et al., 1975b; Shore, 1995). Although they acquire the capacity for shifting reference in simple sentences, they have yet to learn the social and linguistic conventions that govern use of that capacity (Bloom et al., 1975b; see also, Garvey, 1979). Among the different pronoun forms, children first learn to sort out the appropriate distinctions in reference to self before other, with first-person pronouns to mark different perspectives on agency (Budwig, 1989) and speech role (Charney, 1980).

Increasing sophistication with still other language forms often occurs with lingering naïveté about the appropriate social and personal contingencies that govern those forms. For example, a 2-year-old, Ricky, whose own TV watching was heavily monitored, responded to a 28-year-old who said he liked watching a particular TV program by exclaiming incredulously "Your mother lets you?" (Shatz, 1994, p. 326). A 2-year-old, Eric, ran after another 2-year-old who had taken off with his toy, shouting "Rob! It's not to play with!" even though it was a toy Rob was running off with (Bloom, 1970, p. 230). Thus, while children learn the pragmatics of language use and participate in conversations from the beginning of word learning, conversational skills continue to depend on development of what Shatz called "social-linguistic intelligence."

Another example of dissociation between developments in complexity and discourse was reported by Hoff-Ginsberg (1994). When equated on the basis of their average length of utterance, first-born children tended to be more proficient in syntactic ability, while second-born children showed more advanced conversational skills. This difference between children with and without siblings was attributed to differences in the kinds of interaction they each had opportunities for. First-born children typically participate in more interactions with adults, whereas second-borns also have conversations with their older siblings who provide fewer experiences with complex sentences (Hoff-Ginsberg, 1994; Toledano, 1991).

Learning language and learning to participate in conversations entails many developments in addition to developments in language. Culturally, children are not only learning the language—by learning a language, a child is learning to participate in the "give and take of everyday
life” and assume a role in the cultural life of the community (Schieffelin, 1990). Social and affective developments are required because the motivation to learn a language in the first place comes from the need to sustain intersubjectivity with others and establish the self in a social world. And cognitive developments—the symbolic capacity and conceptual structure in particular—are required for constructing the increasingly discrepant and elaborate intentional states expressed by language and interpreted from the expressions of others. These are core assumptions in the intentionality model, and central to the model is the initiative expressed by language and interpreted from the first place comes from the need to sustain intersubjectivity and agency of the child who constructs the intentional states that determine the relevance of events for learning (Bloom, 1993).

However, much research and theory on the importance of discourse and social context for language acquisition focuses on the “very considerable role of the adult” (Bruner, 1983, p. 40) who interacts first with the very young infant, to provide the structure for their turn-taking and reciprocal vocal exchanges, and then with the older child to provide the “scaffolding” or “support system” for their conversation and language learning (e.g., Bruner, 1975b, 1983; Kaye & Charney, 1980). The scaffolding model assumes that adults control their interactions with young children by providing the format and structure of their exchanges, and that learning language depends on such formatted interactions. The adult’s role is, therefore, primary (e.g., Bruner, 1983; Kaye & Charney, 1980; Ninio & Bruner, 1978). The essentials of the model have been endorsed by many, most notably by Dore (1983), Snow (1977), and Tomasello (1992a). (See Moerk, 1989, for a general review.) The original theoretical model for scaffolding had its roots in Vygotsky (1962)—who stressed the importance of what a child first does only with guidance from other persons. The scaffolding model was strengthened with Vygotsky’s extension of his theory to learning in the “zone of proximal development” (ZPD) which is the distance between a child’s actual developmental level and the level of potential development possible “under adult guidance or in collaboration with more capable peers” (Vygotsky, 1978, p. 86).

The scaffolding/ZPD account of conversational interaction and language learning has been challenged in several ways. First, such context-specific learning is culturally determined and may well be culture specific. Mothers in some non-western cultures, such as Papua New Guinea and Samoa, for example, do not engage their infants in the joint and reciprocal gazing and vocalizing described in early mother-infant interactions in western societies (Ochs, 1988; Ochs & Schieffelin, 1984; Schieffelin, 1990). Mothers and children in different cultures and even within the same culture differ also in the extent to which they participate in highly structured and conventional routines, games, and joint picture-book reading (Camaioni, 1986; Goddard, Durkin, & Rutter, 1985; Snow & Goldfield, 1983).

Second, the asymmetry inherent in traditional scaffolding/ZPD accounts was challenged by Rogoff and others in an effort to “focus on the role of children as active participants in their own development . . . [and] the complementary roles of children and caregivers in fostering children’s development” (Rogoff, 1990, p. 16). Children are active participants in their interactions with others, but in Rogoff’s theory, they nevertheless require guidance and direction in their shared endeavors (Rogoff, 1993). And third, the extent to which caregivers provide a structure for interaction depends on what they and their children already know about the events in which they are engaged, as well as other prior knowledge that they share (Lucariello, 1987b).

When one looks beyond the formatted routines and games such as picture-book reading, peek-a-boo, or a tea party that provided the original observations on which the scaffolding model was based, a different view of early interactions emerges—one in which the child’s role is salient. It is the child who initiates conversational exchanges most often when children and caregivers are engaged in free play and other activities of daily living (Bloom et al., 1995, 1996; Harris, 1992; Howe, 1981). Mothers are more interested in maintaining a conversation by letting a child know that a message had been shared than in providing language models for the child to learn. Thus, participation in early conversations is motivated by a child’s own cognitive, social, and affective agenda to express something in mind and to direct the flow of the interaction in order to share the contents of mind. Neither conversation nor language learning depend on mothers setting up formats as the occasions for scaffolded interactions (Bloom et al., 1996; Rome-Flanders, Cronk, & Gourde, 1995).

To be sure, caregivers talk to their children—some talk a great deal. Most caregiver talk is about what children are doing, thereby providing the relevant experiences with language that they need. But language learning can occur in these contexts without the child having to say something at the time. Outside of language, children take in a great deal and learn about what goes on around them all the time—without having to show the effects of that learning in their immediate nonlinguistic actions and behaviors. The language a child brings to a conversation,
therefore, is language already learned from what has been heard and overheard in a multitude of actions and interactions. In fact, children can recruit cognitive resources to language more readily if their essentially limited resources are not also stretched by having to process and respond to what someone else has just said, particularly if a response is required to something that is not relevant to what the child already had in mind (Bloom, 1974, 1993; Bloom et al., 1975a, 1976; Elbers & Wijnen, 1992). Indeed, this point gains considerable support from studies of children talking in their cribs alone, before falling off to sleep. More sophisticated forms of language occur in crib speech than are observed in typical daytime interactions with other persons (Kuczaj, 1983; Nelson, 1990; Weir, 1964), because children have greater “freedom to direct their own behavior” (Kuczaj, 1983, p. 168).

The force of the child’s intentionality and its centrality for language development, in general, and developments in conversation, in particular, are enhanced by the finding that the same patterns of interaction occur among different populations of children and mothers. For example, one corollary of limited economic resources is that children and caregivers in poor families engage in fewer extended conversations when compared with middle-class families (Bloom et al., 1996; Hart & Risley, 1995), and they tend to do more overlapping talking. Overlapping turns are evidently acceptable in culturally different societies and even valued by the participants in certain contexts (e.g., Cazden & Dickinson, 1981; Ervin-Tripp, 1979; Heath, 1982, 1983; Whatley, 1981). But regardless of such possible economic and/or cultural effects as these on their behaviors, children from poor homes are also the initiators and in charge of their conversations most often, and their mothers are responsive to them. As with children from less economically stressed homes, they were most likely to be talking in the moments before their mothers talked, and their mothers were most likely to be talking in the moments after they talked (Bloom et al., 1996). Thus, we have no reason to think that the role of intentionality in the developmental process for learning language differs for children from different cultures and societies.

CONCLUSIONS

This chapter began with an account of the theoretical tensions that have resulted from a succession of strong theories of language acquisition, each focused on a different aspect of the problem—either the child’s cognition, or social interaction, or linguistic theories of the target language the child is learning. One reason these theoretical tensions endure is the strength of commitments to explanation based on such strong theories. Another reason the tensions endure, however, is that each theory is partly right—each factor invoked by these theories does, indeed, contribute to acquiring a language. The task now is to integrate the parts and embrace the whole in order to achieve a truly explanatory theory of language acquisition. This task will require constructing theories that put language development into the larger developmental context in which it occurs and that take the active mind of the child seriously in efforts to explain language acquisition.

The influences on language development originate in the child’s intentionality—the contents of mind in consciousness that are determined by affective, social, cognitive, and linguistic processes. A young child’s intentional states are constantly changing—as a function of development and as a function of actions and interactions in the world, including acts of expression and interpretation. Affect promotes engagement with the physical and personal world for learning and for sustaining intersubjectivity with other persons. Social developments press the child to learn a language in order to share contents of mind with other persons and thereby assume a place in culture and society. Developing cognition yields conceptual structure in the knowledge base and the symbolic capacity for the representations in consciousness that language expresses and that result from interpreting the expressions of others. Language is the goal; it influences the process as much as it is influenced by it; and all aspects of development come together in its acquisition. In contrast, when we put all the effort at explanation into only one or another of its aspects or into only the words and linguistic structures of the adult language the child needs to learn, the result is a loss of perspective on the psychology of the child. It is also a loss of perspective on language itself and the power of expression it provides.

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