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Language Development

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The data for studying language development are abundant; virtually all small children are learning to talk. Moreover, it is possible to see in the study of language development a host of relevant issues and ideas that bear on the nature of language in general and, indeed, on the nature of mind and mental development. However, different investigators have observed and described the data differently and have asked different questions of the data. In reviewing recent research it will first be helpful to place the last decade within the larger perspective of the study of language development in the last half century. The themes that will be seen to emerge from this brief perspective are the primary issues that have concerned researchers in the 1960s and into the 1970s. These are: the nature of the code—what it is that is learned; the process of language development—how learning and maturation come together in the acquisition of the code; and sociological and cultural differences—as influences on differences among individuals.

Perspective

Until the 1950s, there were two major thrusts in research in language development—the diary studies of individual children and the large-scale studies of large numbers of children across age and social class. The diary studies reflected the fascination of a linguist or psychologist parent with a young child's progress in learning to talk. They varied greatly in scope and duration and several have become landmarks in the literature: for example, Ronjat's study of his son's bilingual (French-German) development (1913); the four-volume study by Leopold of his daughter's bilingual (English-German) development (1939–49); the Sterns' study in German (1907); the studies of French-speaking children by Bloch (1921, 1924), Guillaume (1927), and Grégoire (1937); and the study by Chao of his...
granddaughter's Chinese development (1951). Renewed interest in these studies is apparent in Bloom (1973), Slobin (1971a), Brown (1973), and Clark (1973).

By far, however, the greatest effort, in this same period of time, was devoted to normative studies of large numbers of children, who varied in age, social class, sex, birth position, and so on. These studies were comprehensively reviewed in McCarthy (1954). The study by Templin (1957) was, perhaps, the last and the most important of what have come to be called count, or normative, studies. It is interesting that the count studies came about in reaction to the diary studies, which had begun to appear in the literature at the turn of the century. The swing towards behaviorism and the striving for scientific rigor in psychology in the 1930s and 1940s resulted in a disparagement of information, however detailed and minutely recorded, gathered by a parent-investigator, who, it was presumed, was necessarily biased in what he chose to record in his notes and in what was overlooked as well. Only objective data that could be counted and described statistically were considered admissible. And, indeed, the major indexes of growth and development have made abundant use of precisely this kind of information.

The studies described certain properties of the form of children's speech; for example, the average length, parts of speech, numbers of different words, and so on, in a representative number (usually 50 to 100) of a child's utterances. The principal result was the specification of linguistic developmental milestones that allowed comparison among individual children or groups of children. For example, children produce a variety of babbled sounds in the first year, and some time around age twelve months, plus or minus several months, firstborn children generally utter their first words. In the last half of the second year, children begin to produce combinations of two and three words; between ages two and three years, children speak in sentences. Developmental milestones such as these have had widespread use in medicine, psychology, speech pathology, and education (see, for example, Lenneberg 1967).

These milestones provide only a very general and gross index of development, and, more seriously, they ignore the notion of development as continuous change over time. Within the single-word utterance period, to take one example, the fourteen-month-old child who is speaking single words but is not about to use syntax, is very different from the child of eighteen or nineteen months who is about to use syntax and is still saying only one word at a time. The specific vocabulary and the ways in which the words are used vary markedly within this particular "milestone" (Bloom 1973). As another example, children's two-word utterances are reductions of their subsequent three- and four-word sentences (Bloom 1970; Brown
1973). Thus, important differences in behavior that occur within a particular developmental milestone and the ways in which the different milestones are actually interrelated and interdependent were easily overlooked in the developmental studies of the 1930s and 1940s.

The reaction to the objective studies of children's utterances began in the 1950s. People began to seek different kinds of information about children and began asking different kinds of questions in language development research. Most important, there was a turn away from descriptions of the form of speech in an effort to discover what children know about language at any point in time. Research in the 1950s, for example, Brown (1957) and Berko (1958), began to inquire into the knowledge that underlies the ability to speak and understand—the "productive system . . . that [the child] employs in the creation of new forms" (Berko and Brown 1960).

The new questions required the development of new research techniques for observing children's response to the manipulation of certain kinds of language and situation variables. Such research generally involved fewer children than was typical of the earlier behaviorist-oriented research but aimed towards obtaining more basic kinds of information. This era in psycholinguistic research has been very amply summarized and described in a number of reviews (for example, Berko and Brown 1960; Ervin and Miller 1963; and Ervin-Tripp 1966). These studies convincingly demonstrated that children do not learn all of the sounds, words, and possible sentences in a language. Rather, what the child learns is an underlying linguistic system that is, itself, never directly available to the child or the adult. The studies of Brown (1957) and Berko (1958) made this point most explicitly and most elegantly. For example, when children in the Berko study were presented with a nonsense word like "wug" that named a small bird-like animal, they had no difficulty calling two of them "wugs." Rather than learning singular and plural nouns as separate lexical items, these children had learned one rule (with phonological variants) for marking the plural distinction.

The fact that children learned phonological and morphological rule systems had long been suspected by the earlier diarists and other linguists (see, for example, Jakobson 1968, and Jesperson 1922). Linguistic field research had generally emphasized discovery procedures in the phonology and morphology of languages. The study of syntax or grammar was quite another matter. It was not at all clear how one could discover the grammar of a language and it was even less clear how much of a grammar existed in early child language. However, with the advent of the theory of generative transformational grammar (Chomsky 1957), the search for grammar became the goal of language development research in the 1960s, evolving
in a very natural way from the interest in underlying knowledge that began in the 1950s. In short, attempts to discover what a child knows were pursued in the 1960s as a search for grammar or the description of the rule systems that could account for the use of sentences.

The investigation of child grammar began with the procedures of structural linguistic analysis (Bloomfield 1933; Gleason 1961; Hockett 1958), but the goals of the research derived from developments in linguistic theory (most notably, Chomsky 1957, 1965; Harris 1957) with the assumption that underlying knowledge of language is equal to a transformational grammar (Braine 1963a; Brown and Fraser 1963; McNeill 1966a; Miller and Ervin 1964). It is at this point that the story of this particular review of the literature will begin, taking up, essentially, where the review for volume 2 of this series by Ervin-Tripp (1966) left off. All of these studies will be considered in detail in the next section. The children in these studies were a relatively homogeneous sample of firstborn children from middle-class university environments. The results of the studies were impressive in that they concurred in their essential findings, even though three different and geographically separate populations of children were involved. The children from whom these data were obtained were again fewer than in earlier research: Braine reported on the speech of three children; Brown and his associates described the speech of two children; and Miller and Ervin used a population of five children. However, each child was seen over a long period of time and was visited at home at periodic intervals (for up to several years by Brown and his associates). The important finding of these studies was that syntax was indeed systematic and the words were not juxtaposed at random even in the earliest sentences.

The finding that early sentences were constructed in an orderly and predictable way, and that all of these children, as well as others studied later (for example, Bloom 1970 and Bowerman 1973), used many of the same kinds of words (person names, object names, and relational terms like "more," "all gone," "this," "on," and the like), led to another important shift in child language research at the close of the 1960s. Attention was turned from description to an attempt at explanation of early sentences. Once the attempt was made to explain why some words occurred more than others and in orderly juxtaposition in early sentences, it became clear that the child's underlying knowledge did not equal a grammar in any simple way. The search began for the cognitive correlates of meaning in language and the cognitive processes involved in language learning (Bever 1970a; Bloom 1970 and 1973; Sinclair-de-Zwart 1969, Sinclair 1970; Slobin 1971a). The emphasis of the 1960s on linguistics and linguistic theory for describing language development, gave way in the
1970s to an emphasis on cognitive development and cognitive psychology for explaining language development.

**The Nature of the Code**

**Describing Language Development**

What children learn in the course of their language development is the *substance* of language development and will be considered here apart from the *process* of development, to the extent that the two have been considered separately in the literature. The question of how language is acquired will be taken up in the next section. What is learned is a linguistic code—a system of signs and the possible relations among them which, together, allow for the representation of an individual's experience of the world of objects, events, and relations. There is, as yet, no adequate description of the nature of any linguistic code, and linguists have generally not been enthusiastic about the study of language development for just this reason. Nonetheless, linguistic theory and changes in linguistic theory have been major influences on research in language development. The descriptions of child grammar that have appeared in the last decade were derived from methods and theory in linguistics, beginning with the influence of structural linguistics, then generative transformational grammar, and then the relation between form and meaning.

**Structuralism and Emphasis on Form**

The structural analysis of language that followed from the work in this country of Bloomfield (1933), Sapir (1921), and much later, Harris (1955) was “distributional.” It was concerned with discovering the inventory of linguistic items in a language and describing the ways in which these items were distributed or combined in relation with one another. For example, in English the plural morpheme has three different phonological shapes or allomorphs /-s, -z, -az/. The distribution of each of those allomorphs is systematic and predictable according to phonological context: words ending in /s, z, ŋ, ž, ч, ј/ add plural /-az/, otherwise words ending in voiceless sounds add plural /-s/, and words ending in voiced sounds add plural /-z/. This distributional rule holds with only relatively minor exceptions (for example, “children” and “mice” and the fact that in certain words final /f/ is changed to /v/ and adds plural /-z/, as in “leaves” and “knives”).

Since the goal of research was to describe the distribution of linguistic elements in speech, the evidence for analysis was obtained from actual utterances. Thus, given a sample of speech from a child, one could proceed to (1) isolate the different linguistic items in the sample, (2) list all of the phonemes, words, morphological markers, and phrase or sentence
types, and (3) describe the linguistic contexts in which each linguistic item can occur. One would then have a taxonomy of linguistic units that occurred in the sample. Gleason (1961) and Hockett (1958) have outlined such procedures in considerable detail. The application of such procedures to child speech data has been described by Brown (1965), Berko and Brown (1960), Ervin-Tripp (1966), and Braine (1971a).

The structure of child speech during the single-word utterance period was largely described in terms of adult parts of speech. As the child's speech matured, it was compared to phrase- and sentence-types of the adult model. Structural grammars of adult speech consisted of lists of different sentence-types, and such a catalog of adult sentence-types was frequently used to chart children's progress in development toward the adult model (see, for example, Loban 1963, and Strickland 1963).

**Generative Grammar and New Goals of Description**

The introduction of generative transformational grammar (Chomsky 1957) in linguistic theory had a profound effect on the study of child language. Essentially, Chomsky proposed that a grammar of a language is something more than a taxonomy of structures or sentence-types such as declarative statements, imperatives, questions, and so on. Following Harris (1957), transformational theory pointed out that there was a closer relationship among such sentences as:

1. The man threw the ball.
2. The ball was thrown by the man.
3. Did the man throw the ball?
4. Who threw the ball?
5. What did the man throw?
6. It was the ball that the man threw.

than among sentences that were all of the same "type," such as declaratives, interrogatives, passives, and so on. That is, the sentences 1 to 6 above (and others) were more closely related to each other, as transforms of one another, even though each is a different sentence type, than were a group of simple active declarative sentences such as:

7. The man hit the ball.
8. The rat ate the cheese.
9. The girl swept the floor.

The theory of generative grammar (Chomsky 1957) attempted to account for this relatedness among sentences in terms of an underlying system of rules. Certain rules in a generative grammar are considered basic, phrase-structure rules that underlie all of the indefinitely many utterances
that are possible in a language. The phrase-structure rules produce a single abstract structure that is considered the underlying basis for all of the sentences 1 to 6 above. Other rules, grammatical transformations, operate after the base rules and are optionally applied in generating such different sentences as 1 to 6 above. Thus, there is a set of optional rules which transform the underlying basis of the sentence into its related passive, interrogative, or other forms. The derivation of an interrogative sentence, for example, would involve the base rules plus an interrogative transformation.

The theory of generative transformational grammar evolved in a dynamic way in the 1960s, and there have been a large number of important theoretical advances (e.g., Chomsky 1965; Katz and Fodor 1963; Postal 1964). For a detailed description of the theory and an extensive list of related references in the early and mid-1960s, one ought to consult Jacobs and Rosenbaum (1968) or Stockwell, Schachter, and Partee (1968).

One way in which the new theory of generative grammar influenced the study of child language was to provide a new and more explicit account of the adult model with which to compare child utterances. Menyuk (1963b) was one of the first to use the phrase-structure rules and transformations proposed for the adult model by Chomsky (1957) to describe children's utterances. The children in Menyuk's study were divided into two groups of forty-eight children each, in nursery school (mean age: three years, eight months) and first grade (mean age: six years, five months). Menyuk found that a large proportion of the children's utterances fit the transformational rules of the adult model, although there were occurrences of redundancy, omission, and permutation that altered the adult rules. These latter operations resulted in structures that differed from the adult and appeared to be restricted to the speech of children.

There are at least two important shortcomings in descriptions of child speech in terms of the structure-types of the adult model, regardless of which adult model one assumes as a criterion (structural or generative). First, when researchers have explained child utterances in terms of an adult rule system, they have been willing to accept a single instance or example of a structure as evidence that the child has knowledge of the structure. A single instance may suffice to identify a structure in adult speech because one can ask the adult for related and supporting information. For example, one could ask the adult speaker, quite simply, if the utterance is or is not acceptable, that is, grammatical. One can also ask the adult for paraphrase and equivalence judgments. The linguist who attempts to write a grammar for an adult language depends upon such intuitive judgments from a native speaker.

There is an important distinction between implicit and explicit knowl-
edge of grammar, and it is not clear how much children are aware of what they know (explicit knowledge). In the last decade, investigators have generally presumed that children know rules of grammar (implicit knowledge) that make it possible for them to speak and understand sentences (for example, Bloom 1970; Brown, Cazden, and Bellugi 1969). It has been notoriously difficult to get children to talk about what they know. On the other hand, some researchers (Bever 1970a; Bowerman 1973) have proposed that children do not know a grammar, per se, and so could not be expected to talk about it. It has been recently reported (Gleitman, Gleitman, and Shipley 1973) that it was possible to tap explicit knowledge with children as young as two years of age. But such research is only in its preliminary stages.

A single occurrence of an utterance type in the speech of a child is simply not enough evidence that he or she knows the rules for generating the structure. A single occurrence may be a well-learned stereotype or an echo of a previous adult utterance. It is necessary to have evidence of the productivity of structures—that is, the use of the structure with different forms in different situations. For example, Brown and Hanlon attempted "to treat the child's production of a construction, in quantity and over a good part of its proper range, together with evidence that he understands the construction when others use it, as signs that he has the grammatical knowledge represented formally by the derivation of that construction in the adult grammar" (1970).

However, there are a number of important arguments against assuming that utterances (or structures) that are identical in both child and adult speech can be attributed to the same underlying rule system. Watt (1970) made a very detailed and explicit case against what he called the "strong-inclusion hypothesis" which states, quite simply, that an utterance in child speech has the same underlying structure and derivational history as the same utterance if uttered by an adult. Watt's examples (in addition to references to stereotype and echo, or "parroting" utterances) are adult-based. He points out, for instance, that a syntactically ambiguous utterance with a single surface form can have two or more different underlying structures and, therefore, would differ derivationally as well (for example, "They are flying planes").

A much stronger argument can be made based on the available child-language data. It has been observed repeatedly (Bloom 1970; Brown and Bellugi 1964; Leopold 1939) that children characteristically talk about events that are immediately, perceptually available in the nonlinguistic context. Adults, in marked contrast, do not ordinarily talk about what they see and what they are doing when a listener is there to see for himself.
It appears that child utterances depend directly on the support of non-linguistic context whereas adult utterances do not. In adult discourse, an utterance that bears no relation to the perceivable situation can elicit an appropriate response that also does not relate to what the speakers see or hear or do at the same time. But an adult who asks a child a question “out of the blue,” will usually draw a blank, unless it is part of a well-learned routine. Although adult and child utterances may be identical in their surface form, there are almost certainly important differences between their underlying cognitive and linguistic representations. The derivation or origin of the child and adult utterances would necessarily differ, probably in proportion to the extent to which the child utterance was dependent on the “here and now” in which it occurred.

Thus, one result of generative transformational grammar was to change the means of describing child utterances in terms of the adult model. But, more important, the theory of generative transformational grammar also changed the goals of child-language description. In asking, What does the child learn? it became apparent that an explanation of language development would need to involve an explanation of how the child achieves linguistic creativity.

Chomsky (1966) emphasized that one who knows a language has the ability to understand and speak an infinite number of grammatical and meaningful sentences that he has never heard or said before. In learning language, the child’s linguistic input is necessarily limited to only those sentences (and nonsentences) presented to him in his environment, and this sample is an incredibly small proportion of the indefinitely many sentences that are possible. Since the child obviously cannot hear all possible sentences, he or she needs to learn the system of rules for semantic-syntactic combinations of words that underlies all the sentences that are possible in the language. That is, the child needs to learn a generative grammar, and that grammar, although manifest in the speech that he or she hears, is not directly accessible to him or her. The major goal of research in the first half of the 1960s was the search for grammar in child speech, and the major focus was on the emerging grammar of early two- and three-word sentences.

Before describing the syntax of early child sentences, it is worthwhile to consider three alternative views of early multiword utterances. If language develops as a trial-and-error process, there should be an early stage of chaotic nonlanguage when the child misses the mark more often than not. Early sentences would be incoherent, unpredictable, and non-systematic, and one could hope for little more than a catalog of the child’s most frequent words and word combinations in whatever order. Although
this is often the layman’s view of what goes on in the years from ages two to four, it was, fortunately, not the original operating assumption of most research in the 1960s.

Most investigators, influenced by insights in the early diary studies and results of experimental research in the 1950s, assumed that early syntax was indeed systematic but potentially idiosyncratic in either of two possible ways. On the one hand, early syntax could be the result of an idiosyncratic child language in which some system, while different from the adult model, was nonetheless the same for all children. That is, one could speak of child language in much the same way as one spoke of the English language or the French language. This seems to have been the operating assumption in much of the work of Brown and his colleagues at Harvard, Miller and Ervin (1964), and McNeill (1966a), and data from different children were sometimes pooled as child-language data. On the other hand, child language was seen as potentially systematic but idiosyncratic for individual children. That is, each child could, conceivably, discover and evolve his or her own particular grammar in the course of his or her development. Although there would no doubt be a core of important similarities among all children, there might also be substantive differences as well. Thus, in the studies of Braine (1963a), Miller and Ervin (1964), Cazden (1968), Brown, Cazden, and Bellugi (1969), and Bloom (1970), the speech of individual children was described separately.

The third view is that child speech is a systematic reduction of the adult sentence-types, rather than idiosyncratic. It turns out that much of the research begun with the operating assumption that child language is idiosyncratic eventually yielded results that supported this third view. That is, although there were important individual differences, children were also alike in many ways. Moreover, child language was more like the adult model than it was different, and the deviations from the model were motivated and coherent rather than errors or mistakes. For example, Brown and Fraser (1963) aptly characterized child speech as “telegraphic”—the words that were left out of two- and three-word utterances were the small, minimally stressed prepositions, conjunctions, and morphological markers. The words that occurred were the content words—mostly nouns and verbs which were most salient and meaningful—and the order in which they occurred corresponded to adult word order, for example, “read book” and “Daddy coat.” “Telegraphic” describes only the product of speaking and does not refer to the underlying process by which such utterances are produced.

1. Neoformalism and descriptive child grammars. The goals of research, derived from generative transformational theory, were to propose generative grammars for samples of child utterances at different times.
Such a grammar would specify a system or process to account for the generation of sentences. Given a large sample of child speech, the goal was to write rules that would account for as many as possible of the utterances that actually occurred or could occur, while not allowing utterances that were presumably ungrammatical. The focus was on the earliest syntax, with children who were about two years old. Brown (1970, 1973) has since labeled this period in which children begin to use two-word utterances as “Stage 1 speech.” Mean length of utterance begins to increase from the single-word stage (1.0) to the time when the larger percentage of utterances consists of two words, and single-word and longer three- and four-word utterances may occur in about equal proportion. The end of Stage 1 speech occurs with mean length of utterance 2.0.

In retrospect, it no longer appears that all of these studies were indeed tapping early Stage 1 speech. Braine (1963a) apparently reported the earliest data. He instructed the mothers of three children to record all word combinations as they began to appear among the children’s single-word utterances. The children, Adam and Eve, described by Brown and Fraser (1963) and Brown and Bellugi (1964), had mean length of utterance between 1.4 and 2.0. Miller and Ervin (1964) did not report mean length of utterance, but, from the examples that were given, mean length of utterance appears to have been greater than 2.0.

Although the goals of such grammar writing were derived from generative transformational theory, there was, unfortunately, no prescribed methodology or discovery procedures for obtaining generative grammars. Moreover, as was pointed out by Chomsky (1964) and Lees (1964), there was no generative grammar of adult syntax, except for the fragment of a grammar of adult English offered as examples of phrase-structure rules and transformations in Chomsky (1957). Consequently, the search for rules to account for the underlying productivity of child sentences began with methods of distributional analysis. Lists of child utterances were arranged according to frequently occurring words, and the pattern in which these words occurred with other less frequently occurring words was determined. For example, Brown and Fraser (1963) reported utterances with “Mom” and “Dad,” “here” and “there”; Miller and Ervin (1964) reported all utterances with “off” and “on” and variants of “this” and “that.”

The major result in which these studies concurred was that the words that occurred most frequently in the children’s speech occurred in ordered relation to other words in sentences. That is, such words as “more” or “it” occurred in either first or second position in two-word utterances, but rarely in both positions (“more juice,” “more read,” “more cookie”; and, “fix it,” “have it,” “do it.”). Braine (1963a) called this small group of
frequently occurring words "pivots"; the remaining words in the child's lexicon, for example, "juice," "read," "cookie," "airplane," were grouped together as "x-words." These two classes of words appeared to correspond roughly to the two broad classes of function and content words in the adult model, and, indeed, Brown and his colleagues described them as "functors" and "contentives," and Miller and Ervin called them "operators" and "non-operators."

Transformed sentence types such as Wh-questions, and passives, were not present among these early sentences, and so the grammars that were proposed consisted of rules which defined a few basic sentence types. Braine's rules provided for three possible syntactic arrangements: pivot + x-word, x-word + Pivot', and x-word + x-word where Pivot and Pivot' were two classes of different words. Brown and Bellugi (1964) proposed a series of rules for the development of the early noun phrase. An initial, single, unified modifier class (essentially a pivot-like class) was gradually differentiated as length of utterances increased, with the eventual ordered arrangement of three different classes: articles, determiners, and adjectives in front of noun forms.

The notion of "pivot grammar" as the child's "first" grammar dominated language development research through the mid-1960s. The distributional evidence—the fact that a small group of words occurred with great frequency in fixed order relative to other words in child speech—was indeed impressive. Children were apparently learning different kinds of words and something about word order. However, the difficulties in the "pivot grammar" account were soon apparent. One problem was that the two classes of words did not really have counterparts in the adult grammar. Adult syntax, particularly in a generative grammar account, is considerably more than the juxtaposition of classes of words. There is a hierarchy of structure in rules of generative grammar, and rules are mutually dependent on one another. Such rules do not just label sentence-types. Moreover, the essence of sentence structure is the relationship among constituents, and the function of phrase-structure rules is to specify the grammatical relations among subject-verb-object. Pivot grammar rules said nothing about the meaning relations between words and gave little insight into how basic grammatical relations would ultimately evolve in child sentences.

McNeill (1966a) attempted to reconcile these difficulties and expanded the pivot grammar notion in an effort (1) to show that the two original classes were generic to the grammatical classes of the adult model, and (2) to account for the basic grammatical relations of adult sentences. He proposed more complex pivot grammar structures that were hierarchical in that the original "pivot + x-word" phrase was embedded in a still larger pivotal phrase. Such structures, he suggested, functioned as either subject
noun-phrases or predicate phrases. McNeill proposed that the limitation to two-word utterances was due to the fact that children were unable to combine both subject and predicate phrases in a single utterance. However, the rationale for deciding whether the underlying function of a phrase was either a subject or predicate noun-phrase was not specified. The result was still tied to the distributional method.

All of the accounts of early child syntax that used generative transformational grammar as a heuristic resulted in a new kind of formalism. Child utterances were obviously systematic, but the nature of the system was described in terms of the form of linguistic elements and the way in which such elements were arranged relative to one another. The categorization of words as " pivots" or "x-words" was the result of the linguistic description. It had not been demonstrated that the two classes were, in fact, used categorically by the child.

Slobin (1966) found evidence of the same distributional phenomenon. In Russian diary studies, a small group of words occurred with great frequency and in fixed order relative to a larger group of relatively infrequent words. He found that, indeed, there was evidence of the same kind of early syntax in Russian, even though Russian, an inflectional language, depends far less on word order to signal semantic relationships than does English. This raised the issue of the extent to which linguistic development was language-independent, and inquiry was begun into the possibility of developmental universals as either a corollary, consequence, or cause of the linguistic universals that had long been sought by, for example, Sapir (1921), Greenberg (1963), and Chomsky (1965). Cross-cultural research in language development moved ahead rapidly at Berkeley with the development of a manual (Slobin 1967) that compiled research methods and provided further details of procedures used in the previous decade. A number of field studies began at Berkeley and elsewhere (for example, by Bowerman 1973, at Harvard, and Solberg 1971, at Cornell).

But while the cross-cultural work was begun as a search for pivot grammar, both the goals and the methodology were quickly changed. Parallel developments occurring in the study of language development and in linguistic theory made it apparent that underlying syntax was inextricably bound to the semantics of sentences and that the essence of language had to do at least as much with underlying meaning as with the surface form of linguistic representation.

The Relation between Form and Meaning

There were ample grounds for criticizing the pivot grammar account of child language, and many of these arguments have been presented extensively (Bloom 1968, 1970, 1971; Bowerman 1973; Brown 1973;
Schlesinger 1971). To begin with, the pivot grammar account ignored meaning entirely, and, as pointed out most explicitly by Schlesinger, it was the underlying semantic intention that was coded in the surface form of children's utterances. Further, there was no structure corresponding to pivot grammar in the grammar of the adult language, and the analogy with the function and content words of the adult lexicon simply did not fit. For example, the word “Mommy” could not be anything but a content word in referential function, but its distribution was pivotal in the data reported in Bloom (1970): for example, “Mommy pigtail,” “Mommy kiss,” “Mommy diaper.” Moreover, it was not immediately apparent how one could account for the child’s arriving at the basic grammatical relations represented in adult phrase-structure knowing only something about the permitted occurrences of individual words.

Both Bowerman (1973) and Brown (1973) advanced the case against pivot grammar by refuting the distributional phenomenon itself in the published, as well as unpublished, data. They pointed out that there were exceptions and that pivot words did occur in both positions, so that pivot grammar was not even accurate as a surface description. However, the exceptions that occurred were far less impressive than the overwhelming evidence of the distributional phenomenon that was available not only in the recent literature and the earlier diaries but in real-life situations—on any playground, in any preschool playgroup, or day-care center. It appears to be fact that children use a few words far more than other words, in relatively fixed position, and that the large majority of words that they use occur relatively infrequently in their speech.

The most compelling arguments against pivot grammar as an account of what children know when they first begin to use sentences are, first, that the distribution, which does indeed occur, has to do with what it is that children are learning to talk about. Second, the order in which words occur in multiword utterances is only superficially similar. The same order can occur with two very different underlying semantic relations between the words, indicating that children are learning different underlying structures rather than superficial word order. For example, in twenty-nine instances in which “Mommy” occurred in first position in the two-word utterances spoken by a single child described in Bloom (1970), it was possible to identify the following underlying relations being coded by the superficial form “Mommy plus x-word”: agent-action, agent-object, and possessor-possessed.

Children use certain words far more than others because of what these words mean for them. Certain words happen to code important cognitive distinctions for children between the ages of one and three years. These distinctions have been represented in the speech of just about all of the
children whose speech has been studied so intensively in the last decade, although we must keep in mind that the number of children involved in these longitudinal psycholinguistic investigations is still not many more than twenty. Brown (1973) has looked at both the available contemporary data and the older diary studies and has identified virtually a closed set of such distinctions.

Bloom (1970) and Schlesinger (1971) each reported independent studies in 1968 that attempted to account for the underlying semantics of early sentences. The basic grammatical relationships between subject-verb-object were represented in early two-word utterances, with subject apparently functioning as agent of an action most often. But whereas McNeill (1966a) had earlier proposed that the child's first phrases functioned as either subject or predicate, it became apparent that, in the speech of one of the children studied by Brown, such disjunction was not, in fact, the case. Although verb-object phrases (or predicates) occurred abundantly, subject-verb and subject-object phrases occurred as well. Thus, all of the basic grammatical relations occurred among the utterances in a corpus but could not be represented entirely within the bounds of a single utterance due, apparently, to some constraint on linguistic and psychological processing.

Bloom (1970) reported other semantic relations between two words that were identified on the basis of how certain of the words were used. The word “more” or “another” signaled another instance or recurrence of an object or an event after its previous existence; negative words like “no,” “no more,” or “all gone” signaled the disappearance or nonexistence of an object or action in situations where existence was somehow expected; and words like “this,” “that,” “Hi,” or simply “a” served to point out the existence of an object or action (this last function was referred to as “ostension” by Schlesinger and “nomination” by Brown). In two-word utterances of this type, the meaning of the relation between the words was derived from the meaning of one of the words, such as “more,” “all gone,” or “this.”

The semantic relations possession and location were of a kind that were less adequately defined on the basis of the meaning of one of the component words. Bloom, Lightbown, and Hood (1974) found that, in the earliest data from three children (Kathryn, Gia, and Allison), possession was represented by two substantive words, for example, “daddy coat.” Possession was subsequently signaled by a possessive marker such as “my” or “your.” Location was first represented by two substantives in juxtaposition (for example, “sweater chair,” which was said when Kathryn carried her sweater to the chair) and subsequently by a locative word such as “there,” “up,” “right here,” or “on.” Similarly, agent and
object were most often nouns and pronouns when these functions appeared subsequently. However, in the speech of two other children (Eric and Peter), agent, object, possessor, and location were first signaled by a function form ("I," "it," "my," and "there") that determined the relational meaning between the two words in an utterance. This difference among these children represents the two alternative strategies for learning grammar that were suggested in Bloom (1973). One strategy depends upon the child learning to use certain words with constant form and constant meaning (such as the inherently relational terms "more," "this," "no," "my") in two-word utterances, where such words determine the semantic-syntactic relationship. The second strategy involves a linguistic categorization, where different words (such as "Mommy," "Daddy," "baby") form a class for the child because they can have the same meaning (for example, agent) relative to other words. In this case, the semantic-syntactic relationship between the words is independent of the lexical meaning of either of the words. Other relations between words occurred less often; the attributive, with forms other than those already reported, was apparently a later development, as was the dative, which was rare in all of the data.

The semantic-syntactic relations between words appeared to develop in two-word utterances as follows. Children used certain words that referred to the existence, nonexistence, disappearance, and recurrence of objects. These words (such as "this," "more," "no," or "all gone") operated as function forms in relation to other words such as "cookie," "book," "read," and "fit." At the same time, there were other relations between words that were not specified by the words themselves, such as the relation between object located and place of location, possessor and possessed, and agent and object of an action. After the appearance of these relations in two-word utterances, later development consisted of (1) specifying more than one such relation within a longer utterance, for example, "Mommy more juice," or "drink Mommy juice," and (2) specifying other relations, such as the dative, and attributes of relative size, color, or state. Thus, in the developmental sequence of syntactic structures, the noun phrase (with "adjectives" other than "more," etc.) and the morphological markers of plural and possessive /-s, -z, -z/, or verb tense, and so on, were relatively later developments. The explanation for this sequence appears to be largely a psychological one: the order in which children learn syntactic structures apparently reflects the order in which they learn to distinguish and organize aspects of their environment. Thus, plurality and relative size and color were not coded in the earliest utterances because they were apparently not among the earliest discriminations the children made.

There were two important conclusions to be drawn from these results. The first had to do with the fact that the distinction of certain words in
children's early sentences could be *explained* as well as *described,* and the explanation had to do with underlying cognitive function. Specifically, the children were using the semantic-syntactic relations between words which coded certain of their mental representations of the world of objects and events. The second conclusion was that the children had learned something about grammatical structure for representing (and distinguishing among) these underlying conceptual representations, which said more about their linguistic knowledge than that they knew which word forms could follow one another in speech. Both conclusions influenced subsequent theorizing about language development, and two major questions in language development research after the 1960s had to do with (1) the cognitive prerequisites for language learning and (2) the best linguistic theory and formulation for representing children's linguistic knowledge.

1. *Cognitive prerequisites.* Cognitive development in relation to language learning became the dominant issue in theory and research in the beginning of the 1970s. The relations between language and thought, and their development in children, have been interesting to philosophers and psychologists for centuries. In its contemporary form, the issue has revolved around whether children acquire or somehow know the grammar of a language in the abstract sense proposed by Chomsky (1965) and McNeill (1966a, 1970), or whether they learn language as a representation of their logically prior conceptual learning as proposed by Piaget (1967).

One of the earliest attempts to deal with this question directly, both experimentally and theoretically, was reported by Sinclair-de-Zwart (1969), a close associate of Piaget. She distinguished between language as an object of knowing and a means for learning. Her intent in the series of experiments she reported was to determine (1) the linguistic forms used by children who had achieved certain stages in cognitive development, such as the notions of conservation and seriation, and (2) whether one might hasten the development of such notions in children who did not yet have them by teaching them the relevant speech forms. That is, would preoperational children who could not conserve or seriate be able to do so if they knew the right words and linguistic structures used by operational (conserving) children?

Sinclair reported, first, that the language used by the two extreme groups of conservers and nonconservers (there was also an intermediate, transitional group in her study) was different. Preoperational children who did not conserve described the materials presented to them in absolute terms, for example, "this one is big, this one is little." The children who were able to conserve used coordinate structures, such as "this one is fatter but shorter" or "this one is bigger than the other one." The two kinds of
language were not actually confined to use by only one or the other kind of child. Apparently, some children from both groups used both kinds of language (Kowalski 1972). The major point made by Sinclair-de-Zwart was that while it was possible to teach the preoperational children the language used by the operational children (with different materials, of course), they still failed to demonstrate conservation or seriation when retested. Sinclair-de-Zwart concluded that knowing the words and structures was not enough and would not lead to the induction of the relevant cognitive operation.

Piaget’s contention that language depends upon, as a logical consequence of, the prior development of relevant cognitive structures, is strongly supported by the results of research in early language development (Bloom 1970, 1973). Children learned precisely those words and structures which encoded their conceptual notions about the world of objects, events, and relations. Children learned that things exist, cease to exist, and then can recur; that people do things to objects; that objects can be owned and located in space. In retrospect, it seems quite obvious that these would be the things that children talk about at the end of their second year. The child’s awareness of such phenomena has been described by Piaget (1954) as the essence of sensorimotor intelligence as it develops in the course of the child’s first two years of life.

The counterargument, that children learn words and structures and then attempt to use these in order to make sense of their environment, can be refuted by several kinds of evidence. It is apparent that children know and can even talk about such phenomena as agency, possession, location, recurrence, disappearance, and the like, without knowing the corresponding linguistic forms for their representation. First, as reported in Bloom (1970), the basic grammatical relations were developmentally progressive, that is, children did not characteristically begin talking in sentences with subject-verb-object strings. Although they may have known these grammatical relationships among words, and have been limited to only one relation per utterance, they may also first have learned to use one or the other. For example, verb-object predominated in the speech of the three children studied by Bloom (1970); subject-verb predominated in the speech of the three children studied by Bowerman (1973). Moreover, younger children who used only single-word utterances also presented considerable evidence of an awareness of such relationships in experience, although they did not have the structural knowledge for linguistic representation (Bloom 1973; Greenfield, Smith, and Laufer, in press; Ingram 1971). Further, in the development of negation reported by Bloom (1970), the children learned to express different semantic categories of negation before they learned different contrasting linguistic structures. When the children began to use syntax to talk about a different concept
(rejection and then denial as categories of negation), they used the primitive structure that they had used earlier to encode syntactically the notions of nonexistence and disappearance.

The search for linguistic universals in child-language data in the 1960s was largely motivated by the distributional evidence of word order in the early utterances of English-speaking children. Slobin (1966) had looked for the distribution of pivot and open class words in the Russian language development literature. Bowerman (1973) studied development in Finnish, a language that, like Russian, depends on inflectional processes rather than on word order, to determine how universal, that is, independent of specific languages, the systematic word order in early two- and three-word sentences would be. The early results of the search for universals in linguistic development, and the emphasis given to innatist views of the origin of language by Chomsky (1965), McNeill (1966a), and Lenneberg (1967), raised a number of questions concerning the child's cognitive development and the extent of universality of underlying cognitive function as it relates to language development. Slobin (1971a) compared the reports of research in about thirty languages and attempted to specify a set of linguistic-cognitive principles that could account for the cross-linguistic data.

Thus, the beginning of the 1970s marked a major shift in research in language development, away from the description of child language in terms of linguistic theory and towards the explanation of language development in terms of cognitive theory. There was an important change from the early research reports that described such utterances as "Mommy pigtail" and "bear raisin" as "noun + noun" or "x-word + x-word" (Braine 1963a; Brown and Bellugi 1964; McNeill, 1966a), to the description of the same utterances as "possessor-possessed" or "agent-object" by Bloom (1970) and Brown (1973). It is of considerable interest that there was a corresponding shift in the study of linguistics and linguistic theory in the same period of time. The role of semantics in grammar became the major issue in linguistics in the late 1960s as it became increasingly clear that semantics and syntax could not be separated and analyzed apart from one another. Several new semantically based models of linguistic theory began to appear (see Bach and Harms 1968; Lakoff 1968). Because of the new interest in meaning and function in child language occurring at the same time, different investigators began looking among these new linguistic models for the "best theory" for representing what children know about language.

2. The best theory for describing child language. The grammars proposed in Bloom (1970), following Chomsky (1965), were offered as an account of what children know about syntactic structure. It was explicitly assumed that the syntactic structure of utterances could be described only
in terms of the underlying meaning that is encoded in or represented by what the children said. An implicit assumption was that such grammars represent linguistic hypotheses about children's knowledge of sentence structure. Bloom (1970) did not attempt to specify the semantic component of a generative transformational grammar, which in Chomsky (1965) functioned somehow to interpret syntactic structure. It was assumed that syntax and semantics were mutually dependent and that one could not be described or accounted for without the other. The inferred meanings of the children's utterances were the primary data for arriving at the rules of grammar which accounted for the structure of their sentences.

Schlesinger (1971) suggested that children's sentences derived from an underlying semantic basis—specifically, the child's semantic intention—rather than the syntactic basis specified by the phrase structure of generative transformational grammar. The form of utterance would be determined by what the speaker intended to talk about, and the syntax of the utterance would depend directly upon its underlying meaning.

The issue of semantics in linguistic theory became a dominant concern in generative grammar after the emphasis on syntax in the original theory revealed that syntax was inseparable from underlying meaning. Innovations in semantic theory proposed that an underlying semantic basis derivationally precedes the operation of rules of syntax (see, for example, Bach and Harms 1968; Bierwisch 1970; Chafe 1971; Lakoff 1971; Leech 1970). Because semantics is an account of meaning, and meaning derives from mental representation of experience, the new descriptions of the semantic structure of language began to be used in accounts of early language development.

The one semantic theory that seemed most attractive and most immediately relevant to child-language data was case grammar as proposed by Fillmore (1968). Noun forms characteristically predominate in the speech of children, and many two-word utterances include at least one noun as a constituent. Case grammar accounts for the semantic structure of sentences in terms of the meanings of noun forms, as specified by certain prepositions, in relation to verb forms. The semantics of early child-language became the focus of research, and case grammar appeared to be most readily applicable to child-language data (Bowerman 1973; Greenfield, Smith, and Laufer, in press; Ingram 1971; Kernan 1970).

Bowerman (1973) recorded the speech of one English-speaking child, Kendall, and two Finnish-speaking children, Rina and Seppo, in order to compare development in two languages that code meaning differently. English is a language that depends primarily on word order, while Finnish is an inflectional language where word order is essentially variable. Bowerman described semantic structure in terms of case grammar for utterances with mean length less than 2.0 morphemes and compared these case gram-
mars with transformational grammars in order to test the adequacy of the
different sets of conceptual notions in their speech as had been reported in
case grammars could account for more of the semantic information that
was obtained for the utterances than could transformational grammar.
For example, in Seppo's speech when mean length of utterance was 1.42,
"father clock" was specified as dative (person-affected) + objective, and
"chick shoe," where the chick was on the shoe, was specified as locative +
objective. The case symbols were unordered in these specifications and
did not necessarily correspond to the order in which the corresponding
elements appeared in the children's utterances.

Bowerman proposed that children do not have knowledge of such
grammatical structure as subject-of-sentence, or predicate, or object-of-
verb. Rather, their knowledge is semantic, and they learn such semantic
relationships as agent-object, possessor-possessed, person affected-location,
and so on. However, she found that these relationships were, indeed,
marked initially by consistent syntactic word order in both languages.
In the Finnish children's speech, there was a preferred word order initially
(which matched the preferred word order that she also found in the
mother's speech), although word order became more variable, as in the
adult model of Finnish, as mean length of utterance approached 2.0.

Bowerman's conclusions were similar to those offered by Schlesinger
(1971): children first learn semantic relations between words, and these
determine the subsequent development of such grammatical notions as
subject and predicate. According to Schlesinger and Bowerman, early
two- and three-word utterances represent semantic rather than syntactic
relationships. However, syntax clearly exists if children discover, as they
do virtually from the beginning, that the semantic relations between words
can be marked by word order. Moreover, the facts that different words
express the same semantic relation, and different semantic relations occur
with the same words, such as (in Kathryn's speech) possessor-possessed in
“baby (s) shoe” and “Mommy (s) sock”; agent-object in “bear raisin”
and “Mommy pigtail”; and person-affected-state in “baby tire (d)” and
“Mommy busy,” appear to be evidence of the superordinate categorization
of words as, for example, sentence-subject. Bloom, Lightbown, and Hood
(1974) reported that Kathryn, Gia, and Allison expressed the same
semantic relation with different words (for example, action-object—
“eat meat,” “comb hair,” “read book”; and locative-action—“sweater
chair,” “sit floor”). However, Eric and Peter used a system in which the
same semantic relation was marked by a constant relational term (for
example, action-object—“fix it,” “find it,” “turn it”; and locative-action
—“put there,” “screw there,” “sit there”). The fact that the same semantic
relations can have two alternative and consistent representations in the speech of different children is evidence that children are learning semantic-syntactic structure, or grammar.

Brown (1973) has reviewed the arguments of Bowerman and Schlesinger and compared each with the analysis reported in Bloom (1970) in an effort to propose the "best theory" for representing children's linguistic knowledge. He concluded that the semantics of children's first sentences could not be as fully represented within the framework of the original theory of generative transformational grammar as they could be in case grammar terms. However, generative grammars of child language do account for the syntax of utterances. Generative grammars also represent the semantics of utterances to the extent that the order of elements is semantically determined; the underlying structure of the sentence is the meaning of the sentence. Finally, generative grammar appears to be more powerful than case grammar in accounting for a wider range of structure in the child's continuing and subsequent development and in the adult model.

Unfortunately, as promising as the developments of linguistic theory were for describing the language-acquisition data in the beginning of the 1960s, linguistic theory at the start of the 1970s appeared to be of little help. As linguists have begun to look to philosophy and cognitive psychology for the answers to many of their questions about the nature of language, there is no longer a unified theory of generative grammar. Writing grammars for later child-speech appears to offer more frustration than ever and no longer seems to be a promising endeavor. There is no available model of what such a grammar might look like nor a consensus of the kinds of information it might account for. Theories of linguistic meaning have come to be thought of as accounting for cognitive meaning and the result has been a blurring of the distinctions between semantics (meaning as it is coded by natural languages), and cognition (the mental structures and processes of thought).

However, one result of the interest in semantics and underlying cognitive function has been attention to the origins of early grammar in the study of children's use of single-word utterances before syntax.

*Origins of Grammar in Single-Word Utterances*

Research with one-year-old children has attempted to determine whether or not complex structures underlie the single-word utterances that the child actually says. McNeill (1970) argued extensively that such utterances are syntactically structured and that children already know about sentences and grammatical relations. Something like this view of single-word utterances as "one-word sentences" or "holophrases" has recurric throughout the history of research in language development.
However, children's knowledge about sentence structure thus far has not been testable when they say only one word at a time, even in comprehension tasks. One can only make inferences based on their relevant linguistic and nonlinguistic behaviors.

An alternative argument is that the structure that underlies single-word utterances is semantic rather than syntactic (Greenfield et al., in press; Ingram 1971). McNeill (personal communication) has also recently arrived at this conclusion. Ingram, from the data reported by Leopold (1939), observed that the same word, for example, "up," was used by Hildegard Leopold in a variety of situations, with different people and objects interacting in a variety of ways relative to the state of upness. Ingram concluded that such different occurrences of "up" could be explained only in terms of different underlying semantic structures; for example, the child as both reflexive object and agent when she has gotten up, in contrast with the child as nonreflexive object and the hearer as agent when she wants to be picked up.

Greenfield et al. (in press) used case grammar to describe the underlying semantic structure of the single-word and early two-word utterances in the speech of two children. They concluded that there was developmental progression in the children's use of different cases in the single-word utterance period, and that this sequence of development paralleled the subsequent development of cases in syntactic representation.

The argument against linguistic structure—semantic or syntactic—underlying single-word utterances has been presented at length in Bloom (1973). Using video taped data obtained over the six-month period before the use of syntax from one child (Allison, the author's daughter), it was possible to demonstrate that she used different kinds of words and used them differently at different points in time. However, the different words that Allison used, and the way in which she used them, appeared to be functions of her underlying cognitive development. There was convincing evidence that she did not know anything about syntax. She produced series of single words in succession which were obviously related by virtue of the state of affairs being referred to, but which appeared in variable order relative to one another and were not produced in combination as phrases:1

1. In examples of speech events, utterances on the right were spoken by the child. Utterances on the left were spoken by the mother or investigator. Material in parentheses on the left is description of behavior and situational context, and the convention used for the correspondence between linguistic and nonlinguistic data was as follows. Utterances follow one another on successive lines. Ongoing behavior or action is coded in the present progressive form and occurs on the same line as the utterance. Immediately previous (or immediately subsequent) behavior or action is coded in the simple present and occurs on the line preceding (or following) the utterance. Slashes indicate utterance boundary as determined by intervening pause and intonation contour.
At nineteen months, two weeks:

(Allison putting horse on chair) there/
(Allison having trouble getting horse on chair;
Mommy reaching out to help) Mommy/
I'll help. Okay, Mommy'll help you.
(Allison trying to put horse on chair) help/
(no room for horse, Allison giving it to Mommy) horse/ help/
Help?
(Allison pointing to space on chair) over there/

Although she evidently knew something about the lexical meanings of words, there was no evidence that she knew about grammatical meaning. She was evidently aware of certain recurrent relationships among people and objects in her experience, but this conceptual development was apparently not related to linguistic structure—either syntactic or semantic.

In an effort to trace the development of word meaning, Clark (1973) has searched the diary literature and has brought together many observations of how different single words have been used by children in a number of different languages. She concluded that a child learns the meaning of a word by acquiring certain semantic features that are based on perceptions of his world, features based on aspects of objects that can be seen, heard, felt, and so on. The child initially shares with the adult only a small portion of common semantic features, and his or her task, in the course of development, is to learn more and more of the features of a word. At a later time, according to Clark, the child will learn the linguistic function of such perceptually based features, that is, the rules for the combination of different lexical items. Clark illustrated the acquisition of perceptually based features by citing examples of overextension in the literature, where children were reported to have extended the use of a word to things which shared a perceptual likeness, such as size, shape, and the like.

However, children also use certain words that do not share such perceptually based features in each instance of use. For example, words like “more” and “there” or “this” also occur with great frequency among the early words. And yet, a child can call a second cookie “more” after he or she has eaten the first cookie and also call a second horse “more” after seeing the first horse go by. The meaning of “more” in the sense of the recurrence of an object depends upon conceptions or organizations of behavior which do not appear to lend themselves to the kind of feature analysis that is based on perceptual attributes of objects. Also, it is not always the case that children learn the linguistic rules for combination of lexical items after they learn the perceptually based semantic features of such words. Certain words, verbs, for instance, appear to be learned only
in the sense of their meaning in combination with other words, so that it is difficult to know which kind of meaning, lexical or grammatical, came first.

There is, at present, considerable interest and research in progress having to do with the period of single-word utterances, and the reports of such research should be appearing within the next several years. People are looking more closely at what children say in relation to the semantic intent or meaning of their utterances, as has already been described, but also in relation to the speech of the mothers of their children (Nelson 1973), the function of such utterances in relation to context (Greenfield et al., in press), and in relation to the child's cognitive development. Both Sinclair (1970) and Bloom (1973) have concluded that the words that are used in the second year directly reflect the organizing activity of the child as he or she passes through the stages of sensorimotor development that have been described by Piaget (1954). The use of relational terms, such as "more" and "there" predominate in the first half of the second year, and noun forms, or references to classes of objects, do not come to predominate in child lexicons until the achievement of object constancy in the second half of the second year.

But there are a host of questions that remain to be answered in further explorations of children's use of single words before they use syntax. For example, it is not at all clear what the child's comprehension is in this same period of time, or what the function of different behaviors, such as imitation, might be for the process of language development. But it is already abundantly clear that the period in development between first words (at about twelve months, plus or minus a few months) and the use of two- and three-word utterances at the end of the second year is not a single "developmental milestone." Rather, it is a period of considerable growth and change. The child is learning more than a dictionary of word forms and word meanings. The child at thirteen to fourteen months is not about to use syntax, whereas the child of eighteen to nineteen months is about to use syntax—primarily because of the complex changes in cognitive development in that period of time—even though both are saying only one word at a time.

An almost inevitable consequence of, or correlate to, the upsurge in interest in language development in the second year has been a renewed interest in infancy which, for many people in the past, has been considered a "prelinguistic" stage in language development (see, for example, the review by Kaplan and Kaplan 1971, and chapter 3 in this volume). On the semantic, intonational, and phonetic levels, there appears to be at least some preliminary evidence that young infants do pay attention to what they hear. It can be expected that more studies of infants and children in
the first two years of life will emerge and that the emphasis will be on the empirical observation of behavior, rather than on ad-hoc theorizing and speculation.

Semantics and Referential Function

In addition to the interest in underlying semantic intention in single-word utterances and early syntax, the recent focus on semantics in the study of child language has stimulated studies of the development of specific lexical items and domains of meaning. In particular, attention has been given to how children learn comparative terms (Clark 1972; Donaldson and Wales 1970; Klatzky, Clark, and Macken, in press; Milligan 1972; Weiner, in press); linguistic references to notions of time (Clark 1970, 1971; Cromer 1968, 1971; Harner 1973); and definite and indefinite reference (Maratsos 1971).

The acquisition of the comparative terms "more" and "less," and "same" and "different," are of considerable interest for several reasons. For psychologists these terms are central to the evaluation of cognitive functioning and the measurement of intelligence. For example, Piagetian tasks of conservation depend on the child's use of such terms to describe the outcome of certain transformations of the shape of objects or other matter. Judgments of relative amount (more or less) and identity and equivalence (same or different) are central in tests of intellectual achievement, such as the Stanford-Binet. For linguists and psycholinguists, the acquisition of these relational terms provides the opportunity to study how the two terms of an antonymous pair are related to one another.

Experiments by Donaldson and Wales (1970) appeared to confirm the notion that each pair—"more" and "less" and "same" and "different"—were, indeed, coding a particular dimension of meaning. Three- and four-year-old children were presented with (1) a figure of a tree with hooks on it, some of which had apples hanging from them and some of which were empty, and (2) extra apples. The children responded the same way in response to the two directions, "Make it so that there are more apples on the tree" and "Make it so that there are less apples on the tree." In both instances, they put more apples on the tree. Further, when presented with an array of objects and an exemplar of one of the objects, they responded the same way to the directions "Show me one that is the same in some way" and "Show me one that is different in some way." In both instances they picked an equivalent object. Donaldson and Wales interpreted these findings to mean that children first learn only one meaning for both members of a polar pair of adjectives; "less" means the same as "more" and "different" means the same as "same."
Subsequent research, however, has failed to replicate these findings. Weiner (in press) pointed out that there were certain problems in the design of the Donaldson and Wales experiments. For example, in the original experiment, items with “more” were presented to all subjects on one day and items with “less” on a subsequent day. The response to “less” may well have been influenced by this order of the presentation of the items. In Weiner’s experiments, two- and three-year-old children were asked to judge the relative quantity of horizontal arrays of discrete objects arranged in one-to-one correspondence on a vertical board, when initially equal or unequal rows were added to, subtracted from, or left static. Addition and subtraction had little effect on the children’s comprehension. Rather, they understood “more” first when number-characteristics of the arrays were relatively large, suggesting that “many” was an intermediate stage of meaning for “more”—between early understanding of the sense of “existence” and ultimate understanding in the sense of greater quantity. She found comprehension of the quantity “more” developed earlier than comprehension of the quantity “less,” apparently because of the restricted sense of “less” as smaller in quantity. However, these children did not respond to items with “less” as though “less” meant “more.”

Studies that have measured young children’s comprehension of antonymous pairs of adjectives have reported that positive adjectives are understood earlier than negative adjectives: “more,” “big,” “tall,” “high” were better understood than “less,” “wee” (small), “short,” “low” in the studies by Donaldson and Wales (1970); “more” was understood earlier than “less” in the study by Weiner (in press); “big,” “long,” and “fat” were easier to understand than “small,” “short,” and “thin” in a study by Milligan (1972). However, there have been conflicting results in studies reporting comprehension tasks with the temporal terms “before” and “after.”

The semantic domain of temporal references has intrigued philosophers and linguists for centuries. Psychologists have long been aware that the conceptual notion of nonpresent time and linguistic reference to past and future events are relatively late developments in the preschool years. For example, among the Wh- questions that children learn to ask, questions beginning with “when” are usually among the last to occur. It is not clear whether children first learn time-language dealing with past or future. On the one hand, two-year-old children typically comment on their intentions, that is, on what they are about to do, more often than on what they have just done (Bloom and Hood, in preparation). However, it is also true that one can have a conception of future events only in relation to
events already experienced. The ability to plan for and anticipate events that are yet to be depends in a fairly obvious way on the memory or mental organization of what one has already seen or done.

Studies of how children learn both the concepts and the language of time have not been conclusive. Cromer (1968) reported that the children studied by Roger Brown made reference to future time more often than to past time in the age range from two to five years. Other studies of temporal reference have offered conflicting evidence. In a study of temporal decentering by Cromer (1971), subjects did better in comprehending past-tense sentences than future-tense sentences, which is in essential agreement with the findings of Clark's (1971) study of comprehension of "before" and "after."

The terms "before" and "after" are of particular interest because they encode sequential time and are also linguistically polar opposites. In Clark's experiments, three- and four-year-old children were more often correct in responding to items with "before" than to items with "after."

Her interpretation of this finding was not very different from the interpretation offered by Donaldson and Wales of the results of their study of "more" and "less."

Clark concluded that children learn the semantic dimension of time, and that the first binary division in the dimension has to do with plus prior and minus prior events. As with the studies of "more" and "less," and "same" and "different," children apparently first learn the semantically positive term, that is, "more," "same," and "before," and then learn the semantically negative terms, "less," "different," and "after."

Thus far, none of the explanations of this phenomenon appear to be satisfactory. Clark (1971) concluded that children learn semantic features of words in hierarchical order and that the first feature learned in the "before" and "after" domain is the feature [+ prior]. However, the statement that children learn the feature [+ prior] first and then [− prior] seems to be a restatement of the conclusion that they learn to understand "before" and then "after," and is more of a paraphrase than it is an explanation.

Bever (1970b) also found that subjects were better able to understand sentences with "before" rather than "after" when the terms preceded a subordinate clause. Bever concluded that the task was easiest for four-year-old children when order of mention corresponded to order of occurrence, and that the first event in a series was psychologically more salient: both (a) "we sang songs, before we went to bed" and (b) "after we sang songs, we went to bed" were easier than (c) "before we went to bed, we sang songs" or (d) "we went to bed after we sang songs." Amidon and Carey (1972) did not find a difference in comprehension of sentences with "before" and "after" by five-year-old children. They suggested that difficulty in comprehension was due to syntactic rather than semantic
complexity, depending on the location of the subordinate clause: (a) and (d) were easier than (b) and (c) because the subordinate clause followed the main clause.

Most recently, Harner (1973) studied two- to four-year-old children’s understanding of the notions of time in relation to the understanding of time language: verb tense and the terms “before,” “after,” “yesterday,” and “tomorrow.” She found that (1) in linguistic reference to immediate past or future action, verb tense was better understood than “before” (future reference, e.g., “The girl before she jumps”) and “after” (past reference, e.g., “The girl after she has jumped”). (2) In linguistic reference to more remote times, both past verb tense and “after” having future reference (e.g., “toys for after this day”) were understood better than future verb tense and “before” having past reference (e.g., “toys from before this day”). (3) Two-year-old children understood reference to immediate future best; and (4) three-year-old children understood “yesterday” better than “tomorrow.” Interestingly, there was considerable variability in understanding of linguistic reference to past and future events, depending on the particular linguistic form and the situation in which it was used. The terms “before” and “after” were used to refer to both past and future time, and each was better understood when used to refer to the next event or action following the present. Harner suggested that “before” and “after” are each better understood in the context of future time and action rather than past time or action, and are not initially understood as relationally ordering two events with respect to each other.

Certain relational terms, such as before-after, more-less, same-different, inside-outside, and others, have constant meanings, but their referential meanings shift with respect to the contexts in which they are used. Thus, for example, “before” means prior and “after” means subsequent in the ordering of two events or the aspects of a particular event; “more” means larger in amount and “less” means smaller in amount; “inside” means contained within a space and “outside” means excluded from a space. However, the same event A can occur both “before” an event B and “after” an event C; the same quantity X can be described (or referred to) as both “more” than another quantity Y and “less” than a third quantity Z; the same object can be referred to as both “inside” a building but “outside” a particular room; and so on. Such shifting reference no doubt presents a problem for the child in learning the meaning of such words, and no less a problem for a theoretical account of the acquisition of such meanings.

Studies of semantic development have only just begun. In addition to the empirical studies that have appeared, there have also been several attempts to specify a theory of semantic development. One such theory, already discussed, is that children learn a set of hierarchical features of meaning.
For example, Clark (1971) proposed that children learn the following set of temporal semantic markers, *time*, *simultaneous*, and *prior* in the following order: plus or minus *time*; if plus time, then plus or minus *simultaneous*; if minus simultaneous, then plus or minus *prior*.

Anglin (1970) proposed a "generalization hypothesis" to account for the development of word meanings, with progress from concrete to abstract representation. He presented a series of verbal tasks that involved a total of twenty words to subjects ranging in age from seven to twenty-six years. The tasks involved free recall, free association, clustering, and so on. The youngest children were described as being "idosyncratic" in the ways in which they organized words, meaning that they did not treat the twenty words the same way as adults did in the same experiments. The essential difference between the youngest and the oldest subjects appeared to be in the extent to which they recognized the abstract semantic boundaries of form class membership. The syntagmatic-paradigmatic shift in word association responses of children in the age range of roughly five to seven years has been described by Ervin (1961); Entwisle, Forsyth, and Muuss (1964); McNeill (1966b); and, most recently, by Francis (1972). According to these studies, children before the age of six or seven years operate on the principle that words "go together" in a phrasal (that is, syntagmatic) unit. For example, "eat" and "apple" are more alike, that is, more closely related to one another, than words of the same form class such as "apple" and "cup." Anglin proposed that the semantically abstract nature of form class membership continues to be learned through adulthood, by a process of "generalization."

The syntagmatic-paradigmatic shift in word association data remains to be adequately explained. It may be related to Huttenlocher's (1964) finding that four-year-old children were unable to repeat a syntactic phrase in reverse order as well as they were able to repeat a series of unrelated words in reverse order. Most puzzling is the fact that even though five- and six-year-old children do not appear to use form class membership (the part of speech) as a criterion in word association, children as young as two and three years were apparently able to use information about part of speech membership to speak and understand sentences, and to learn something about the meanings of words (Brown 1957).

Another theory of semantic development, proposed by McNeill (1970), suggests that semantic features enter the child's dictionary of word-meanings at large in two possible ways and are not restricted to the meanings of individual lexical items. McNeill distinguished between two hypotheses to explain the development of dictionaries and when and how "a semantic feature spreads through the dictionary." Both hypotheses may be true for the dictionary as a whole. The first hypothesis specifies
a horizontal development; when a word enters the child's dictionary, it may have different semantic features or properties than the same word in the adult dictionary. Semantic development would consist of completing the dictionary entry, that is, adding new features of meaning to those words already acquired, as well as adding new words.

The alternative hypothesis is described by McNeill as a vertical development in which most or all of the semantic features of a word enter the dictionary at the same time, but such features are unrelated to the features of other words already in the dictionary and are separate from them. Vertical development, then, would consist of collecting such features that are common to separate words "into unified semantic features" that transcend the whole dictionary. The horizontal and vertical development alternatives suggested by McNeill imply that the features of meaning in lexical entries are context-free, and it is not at all clear that this is the case.

Higgins and Huttenlocher (in preparation) have proposed that one critical aspect of the dictionary entry for certain words, especially concrete nouns like "dog" or "apple," consists of a prototypical or schematic representation of their perceptual properties. It is this stored perceptual information which makes possible the recognition of class members and the recollection of their perceptual properties. These authors have proposed that the schematic representation of an object class is linked to the schematic representation of the class of word-sounds for that object class.

Bierwisch (1970) specified a theory of semantics whereby components of linguistic meaning were related to the mental representation of physical objects and events. Semantic features do not represent external physical properties, but rather the psychological conditions according to which human beings process the physical and social environment. Thus, they are not symbols for physical properties and relations outside the human organism, but rather for the internal mechanisms by means of which such phenomena are perceived and conceptualized (p. 181).

It is fairly clear that learning the lexical meanings of words, and the grammatical meaning-relationships between words, depends in a rather direct way on (1) how the child perceives and mentally represents objects and events around him, and (2) the ability to process linguistic messages relative to the contexts in which they occur.

It would appear, then, that there is not so much a rigid hierarchy of features of meaning for particular linguistic forms, as proposed by Katz and Fodor (1963) and applied to children's development by Clark (1971), as there is a network of features with sensitivity to situational context. Although the grammar of a language may have a fixed number of dictionary
items and a finite rule system, its meaning components are probably neither fixed nor finite. A theory of semantic development needs to specify how the child takes into account situational and intrapersonal variability in arriving at the meaning components of linguistic items. The research by Johnson, Bransford, and Solomon (in press) and Bransford and Johnson (1972) with adults has demonstrated how the availability of context and prior knowledge can influence comprehension and recall of linguistic messages. We know that one-, two-, and three-year-old children understand and speak in the "here and now," with the necessary support of overt behavior and perceptual context, whereas adults do not. The facts that adults attempt mentally to create situational context when they hear prose passages, and understand more when provided with an overt context, as reported by Bransford and Johnson, indicate that the mental representation of linguistic features of meaning continues to be influenced through adulthood by the interaction of informational, contextual, and pragmatic constraints. The operation of such constraints in the acquisition of features of meaning needs to be specified in a theory of semantic development.

There is much in the child's cognition that is not linguistic; while he does talk about what he knows, he knows about things that he cannot talk about. To be sure, the child necessarily comes to the point where his linguistic capacities can structure his learning—the developmental shift from learning to talk and talking to learn. But the relation between the two and how this transition occurs are not at all clear at the present time.

The Later System

The study of the development of grammar, after the emergence of syntax, has been more fragmentary than the study of early sentences and single-word utterances. That is, there have been few attempts to describe the child's later linguistic system as a whole by proposing a grammar. Brown, Cazden, and Bellugi (1969) proposed a tentative grammar to account for the speech of one of their subjects, Adam, after the early stage of syntax in his speech. Gruber (1967) described the utterances of a somewhat older child in terms of topicalization, suggesting that utterances consisted largely of topic plus comment constructions. By and large, however, most accounts of the speech of older preschool children have focused on one or another particular grammatical subsystem.

1. Emergence of subsystems of grammar. Studies of questions (Brown 1968; Brown and Hanlon 1970; Ervin-Tripp 1970; Holzman 1972), negation (Bellugi 1967; Bloom 1970; Klima and Bellugi 1966; McNeill and McNeill 1968), noun and verb inflections (Brown 1973; Cazden 1968), pronouns (Huxley 1970) have provided data on the language
development of two- and three-year-old children. The information contained in these studies has not been brought together in a unified account of the development of particular subsystems, but all of the evidence does not appear to be in as yet. The studies of negation, for example, while complementary in several important aspects also present different conclusions about the sequence and stages of development. Other studies have offered only tentative conclusions and hypotheses that remain to be tested.

Brown’s account (1973) of the development of morphological changes for the “modulation of meaning” expanded on the earlier study by Cazden (1968) that had described the noun and verb inflections in the speech of Brown’s original three subjects, Adam, Eve, and Sarah. Brown compared these findings with other reports in the literature on the morphological development of children in the same age-range, and the result appears to be a fairly definitive account. He reported that the emergence of grammatical morphemes added to and intervening between the nouns and verbs in child speech begins when mean length of utterance is between 2.0 and 2.5 morphemes. He pointed out that the “modulations” and “tunings” of meaning by grammatical morphemes cannot exist apart from the things and processes that are tuned. But it is possible to talk about the things and processes without modulations, which is probably one reason why the nouns and verbs occur first in child utterances. Brown concluded that the various grammatical morphemes developed in a particular order over a period of two to three years. Although rate of development was widely variant, this order appeared to be relatively constant among different children, as follows: present progressive, in, on, plural, irregular past, possessive, uncontracted copula, articles, regular past, regular third person, irregular third person, uncontracted auxiliary, contracted copula, and contracted auxiliary.

The study of negation by Bellugi (Bellugi 1967; Klima and Bellugi 1966) described three stages in the speech of the three children in Brown’s study in terms of the syntactic form of their negative utterances. In the first stage, Bellugi proposed that negation consisted of attaching a negative marker (such as “no” or “not”) outside of a simple sentence, for example, “no drop mitten,” “no the sun shining.” In the second stage, the negative marker appeared inside of the sentence, for example, “you can’t dance.” In the third stage, the negative sentences approximated the transformationally derived negative sentences in the adult model.

In Bloom (1970), there was an alternative account of the development of negation that considered the syntactic form of negative utterances in relation to their meaning. The addition of semantic information comple-
mented the Bellugi account but also revealed a critical difference in the specification of the form of children's first negative sentences in the first phase of development of syntactic negation.

In the speech of the three children reported in Bloom (1970), there was a clear progression in the development of different semantic categories of negation in the period from nineteen to about twenty-six months of age. All of the children used "no" as a single word to express rejection of something that they did not want to have or to do. At the same time, however, multiword utterances with a negative marker such as "no," or "no more" were comments on the disappearance, nonexistence, or nonoccurrence of an object or event in a context where the object or event was somehow expected; for example, Kathryn said "no pocket" when there was no pocket in her mother's skirt (nonexistence), and Eric said "no more noise" when the vacuum cleaner was turned off (disappearance). Subsequently, after the productive syntactic expression of nonexistence, the children began to use multiword utterances with "no" to express rejection; for example, "no dirty soap" as Kathryn pushed away a sliver of worn soap, wanting to be washed with a new bar of pink soap. The third semantic category that developed after nonexistence and rejection was denial, for example "no truck" (meaning "that's not a truck"): 

Kathryn, at twenty-two months, three weeks:

(Kathryn, Mommy, and Lois looking for a truck)
Where's the truck?
(Mommy picking up the car, giving it to Kathryn)
Here it is. There's the truck. no truck/
(Kathryn continued to look for the truck)

The three semantic categories appeared in the children's sentences in the order nonexistence, rejection, denial, and there was a corresponding development in the form of their syntactic representation. Expression of nonexistence was elaborated in complexity, with variation in the form of the negative marker, including "can't," "doesn't," "not," and so on, before elaboration of the expression of rejection. The form of utterances that signaled rejection increased in complexity before utterances expressing denial. McNeill and McNeill (1968) studied the semantic development of negation in a Japanese child, Izanami, and found a similar sequence of development. Izanami acquired the categories "existence-truth," "lack" of "internal desire," and "entailment-nonentailment" in that order.

When the meaning relation between the negative marker and the rest of the utterance was taken into account, it turned out that sentences in which the "no" appeared before the sentence-subject, were not negative sentences at all (Bloom 1970). Rather, "no" before a sentence was anaphoric
in relating back to something else either said or implied, and the sentence itself was actually an affirmative statement. Although anaphoric "no" would be marked by a comma in adult speech, there was not a corresponding pause in the child utterances. For example, "no doll sleep" occurred without pause between "no" and "doll" and asserted that the doll was indeed going to sleep. The "no" negated an alternative action (in the following, Gia sleeping):

Gia, at twenty-five months, two weeks:
    (Gia had pretended to sleep; getting up and taking her doll)    no doll sleep/
    (Gia put the doll to sleep)

It was not the case then that the first negative sentences in the children's speech consisted of a negative marker attached to a whole sentence. Rather, when the negative marker occurred in a sentence, the sentence did not include a subject. Such truly negative sentences were generally among the most primitive sentences to occur in the children's speech, usually consisting of either an object-noun, or a verb. There appeared to be a complexity limit on the children's sentences, so that the operation of negation within a sentence caused a reduction of complexity and, for example, sentence subjects did not occur. Subsequently, in the further development of syntactic negation, when sentence subjects did occur in negative sentences, they preceded the negative marker, which appeared within the sentence, before the verb. Thus, contrary to Bellugi's (1967) account, negative sentences in the speech of the children described in Bloom (1970), although primitive, were more like the adult model than they were different. Similar results have recently been reported in descriptions of the developmental syntax and semantics of negation in Italian (Volterra 1971) and French (de Boysson-Bardies 1972).

Brown (1968) described the development of the form of Wh-questions, from approximately two to four years of age. Brown was concerned primarily with tracing the child's acquisition of the transformational rules that relate question forms to the corresponding affirmative statements which appear earlier in child speech. He reported a developmental sequence in which an intervening syntactic structure occurred in the transition from a statement such as "John will read the book" to a question such as "What will John do?" or "What will John read?" The last two questions are acceptable in the adult model; that is, they are derived from the set of transformational rules that account for such forms in adult speech. However, before the children in Brown's study produced such questions as these, in which the subject "John" and the auxiliary verb "will," are transposed, and the Wh- word is preposed, they produced such
Bloom

questions as “What John will do?” “What John will read?” “Why he play little tune?” and “Why not you see any?”

In this intervening stage in the development of question forms, the children were only preposing the Wh- word, “what,” “why,” “why not,” and so on; they were not transposing the subject and the verbal auxiliary. Thus, in the course of development, the children seemed to learn and apply a preposing operation before a transposing operation. Both operations are basic in the adult system so that the evidence indicated that the children were learning the grammatical structures that underlie adult Wh-questions, as described in the then current accounts of transformational grammar. However, there was evidently a systematic constraint on learning the operations that Wh-questions involve; the children preposed before they transposed. Brown offered several explanations of the sequence in learning how to ask Wh- questions which depended, primarily, on recurrent discourse patterns between mother and child.

Brown and Hanlon (1970) traced the development of tag and truncated questions in the speech of the same three children. They reported that such forms occurred in the children’s speech in a particular order. Truncated forms (“he did” and “he didn’t”) occurred first and were frequent, before truncated affirmative questions (“did he?”). Tag questions, for example, “We didn’t have a ball, did we?” and “We had a ball, didn’t we?” appeared later. In the order of emergence of syntactic forms in the children’s speech, truncate and tag forms appeared after declarative, question, and negative sentences. The order of progression in Brown and Hanlon’s terms, according to the adult grammar, is from derivationally simple constructions to those that are derivationally complex—indicating that, at least for some developmental sequences, complexity in adult grammar can predict order of emergence of structures or the relative difficulty with which they are learned.

Ervin-Tripp (1970) reported the sequence in which five children responded to different question forms addressed to them after the age of about twenty-five months; “where,” “what,” “whose,” and “who” were responded to in apparently that sequence and before “why,” “how,” and “when.”

In summary, after the emergence of syntax in children’s two- and three-word utterances, accounts of language development have focused on the acquisition of the linguistic form of particular subsystems of adult grammar. All such studies have reported that individual children were different in more or less important respects in the course of development. Most often, there were substantial differences among children in their relative rates of development. But, even if some children reach the target language sooner and trace the course of development more quickly and, perhaps,
more smoothly, all of the children for whom data have been reported appear to have converged on the adult model from the beginning.

However, language development in the age range from three to five years has by no means been adequately described, much less explained. These were the neglected years in the last decade of research, just as they have often been the neglected years in studies of cognitive development. Children produce increasingly complex sentences and use increasing numbers of different words. But, as the studies of semantic development in this age range have shown, the words used and understood by children do not have precisely the same meanings as the same words in adult speech. Also, at about age three, or shortly before, children begin to use certain aspects of language that appear to be more mature than the underlying cognitive understanding of the children (Bloom 1970; Bruner 1966; Inhelder and Piaget 1964). On the one hand, children learn language in the first two years for coding what they know of the world of objects, events, and relations, and they apparently know a great deal more than they are able to talk about. However, there appears to be some sort of linguistic crossover between ages two and three. The syntax of speech, in particular, goes ahead of underlying thought, as in the following example:

Kathryn, at thirty months, three weeks:
(During the last sessions, six weeks previously, Mommy had been ironing in the kitchen while Lois and Kathryn played in the living room)

I came here last night?

Oh, your mother ironed last night?
What did she iron?
Hm. And what did Kathryn do?
Hm. Did you play with me tomorrow?
Yes? Will you play with me yesterday

(Mommy had not been ironing the previous night)

Verb inflection was appropriate in Kathryn’s speech in referring to past and future times. However, although temporal adverbs such as “today,”
“last night,” and “next Monday” were syntactically correct in sentences, the reference of these forms was inaccurate or superfluous. Bever (1970a) has described a characteristic temporary drop between three and four years in the comprehension performance of two- to five-year-old children who were asked to act out different kinds of sentences. He attributed this apparently developmental dip in performance to a change that takes place, at this age, in the strategies that children use in perceptually processing sentences, as a result, apparently, of their learning more about language. The study of the changing relation between child language and child thought in the preschool years has only just begun, but it should become increasingly important.

2. Language development in the school years. There has been a general tendency to view child language after the age of five as being perilously close to the adult model, so that describing the speech of school children has entailed many (if not more) of the problems of describing the target language. There have been a number of such studies, however, and these have differed in methods and in scope. In a recent review, Palermo and Molfese (1971) pointed out that all such studies have reported developmental changes throughout the period from age five to about ten or twelve years. Some studies described the changes in this period in some detail.

Menyuk (1963b, 1964) described the spontaneous speech of nursery school and kindergarten children in terms of rules of grammar (that is, transformations) in adult grammar and syntactic forms that are apparently restricted to child speech. Loban (1963, 1966) collected yearly speech samples from 220 children from kindergarten through the ninth grade and described changes with age in syntactic structure and vocabulary. O'Donnell, Griffin, and Norris (1967) analyzed the oral and written language of children from five to fourteen years. They reported substantive changes in length of output as well as in complexity and variability of structural units.

Other studies have probed the nature of changes in language in seeking explanations of later language development. C. Chomsky (1969) devised a series of experiments in which she explored comprehension of certain linguistic forms which present a particular problem in their acquisition: “easy to see,” which is ambiguous with respect to the subject of “see”; the verb “promise,” which violates a fairly general rule with respect to the subject and object of certain kinds of verbs; the distinction between “ask” and “tell”; and pronominalization. Chomsky pointed out that there are two aspects of “knowing a word”: “on the one hand, the speaker knows the concept attached to the word, and secondly, he knows the constructions into which the word can enter” (p. 5). Her studies were based on the assumption that evidence of the distinction between the two aspects of
knowledge can be obtained from children who know the concept but who do not, as yet, know the constructions which can represent the concept.

The first three constructions tested by Chomsky were relatively specialized and dependent on particular lexical items, whereas the fourth, pronominalization, was more basic. She found that the basic principles governing pronominalization were acquired more uniformly with respect to age across children, and more quickly, at age five to six months. The more specialized constructions varied more among individual children and were acquired later: "easy to see" and "promise" were acquired by age nine; "ask/tell" was still imperfectly learned at age ten. In attempting to replicate these findings with different tasks, Kessel (1970) found that certain of the same distinctions were learned earlier: "ask/tell" at age eight, and "easy/eager" apparently before age nine.

Although these studies on language development in the school years have been only touched on here, it has become clear that children do not "know the language" by age three, or five, or even by age ten. On levels of syntax, semantics, and phonology, they go on learning the language throughout the school years. It is surprising that there have not, as yet, been attempts to tap the intuitions which school-age children have about their language except for the very recent, preliminary study by Gleitman, Gleitman, and Shipley (1973). As children's knowledge becomes less "implicit," it would seem that one could gain considerable insight into what older children know about their language—by such indirect means as paraphrase and equivalence judgment tasks, and by directly asking them to explain certain things that they can or cannot do with words and sentences.

Clearly, the most important development in language in the school years is the child's increasing ability to use the linguistic code, both to speak and understand messages, independently of eliciting states or conditions or of the circumstances in which speech occurs. Linguistic interaction among adults is relatively free from the context in which it occurs; adults do not talk about what is immediately apparent to their listener. Language becomes a means of knowing at about age twelve, when the child becomes capable of the logical operations of thought described by Piaget (1960). Language emerges as truly creative, in the sense described by Chomsky (1966), only through a very gradual process that has really not been touched on in any of the studies of language development in the school years.

The critical question about development that was stimulated by the theory of generative transformational grammar remains: how does the child achieve linguistic creativity—the ability to speak and understand indefinitely many sentences, never spoken or heard before, that are, more-
over, free from eliciting conditions and internal states? There has been, thus far, only a partial answer in terms of the nature of the underlying rule system which the child induces from the samples of speech he hears. This induction of the underlying structure of language occurs, to a large extent, in the preschool years. What may be the more important aspect of the question—how the child subsequently comes to use the linguistic code to talk about events and to process messages about events that are not readily perceivable or imaginable—remains to be explained. This transition from maximum dependence on contextual support to speech which is independent of the states of affairs in which it occurs is the major accomplishment in language development in the early school years. It is not at all clear how empirical or theoretical inquiry can arrive at an adequate account of this transition. But it is clear that until such an account appears or is at least attempted, any theory of language development will be incomplete.

Summary

1. The first descriptions of language development that attempted to represent the syntax of child utterances reported that there was a distribution of different kinds of words in early sentences. A small number of words such as “more,” “gone,” “this,” and “Mommy” occurred frequently in juxtaposition with a large number of other words, each of which occurred relatively infrequently. This result was formalized by rules of generative grammar.

2. It was soon apparent that such distributional rules of syntax could not be explained apart from the underlying meaning or semantics of early sentences. Subsequent inquiry into semantic development revealed that the antecedents of early language development could be found in early cognitive development.

3. Investigation of child language after the first three years centered on the development of such subsystems of grammar as Wh-questions and negation.

4. Language development in the school years has begun to receive attention but remains an unchartered course towards achieving competence with the model language at about age ten to twelve.

Theories, Processes, and Strategies for Explaining Language Development

An important theoretical conflict dominated attempts at explanation of language development in the early 1960s. On the one hand, the child was seen as the ever-changing product of his own maturation. On biological grounds (for example, Lenneberg 1967) and on linguistic grounds
the child could not escape his fate—barring physical or mental complications, he could not help but learn to talk. Such a view placed heavy emphasis on the child—he learned to talk because he was biologically prepared for it or linguistically preprogrammed to do so. In contrast, other theorists (most notably, Braine, 1963b, 1971a; Jenkins and Palermo 1964; Staats 1971) placed heavy emphasis on the influence of the environment in shaping and controlling the child's learning. The child's role in this view was, again, essentially a passive one; his learning was largely determined by the ways in which individuals in his environment responded and reacted to what he said and did. Most recently, attempts at explaining language development have emphasized the active participation of the child, in terms of the processes (for example, Brown and Bellugi 1964; Cazden 1965; Shipley, Smith, and Gleitman 1969) or strategies (for example, Bever 1970a; Bloom 1973; Slobin 1971a; Watt 1970) that appear to influence his interactions with linguistic and nonlinguistic aspects of his environment as he learns to talk.

The argument between those who held that language is innate and that acquisition is the product of maturation, and those who believed that language is learned and is shaped by forces in the child's environment began, essentially, with the Chomsky (1959) critique of Skinner (1957). Since that time, a great deal has been written, and the argument can be followed in Bellugi and Brown (1964), Smith and Miller (1966), Lyons and Wales (1966), Jakobovits and Miron (1967), Dixon and Horton (1968), Reed (1971), and Slobin (1971b). As the dust has settled, it has become clear that neither explanation could be entirely correct, and there has been a shifting of positions in several directions.

Jenkins and Palermo (1964) had put forth one of the most explicit accounts of language learning in terms of mediation and reinforcement theory. Since that time, however, there has been modification of these views, and Palermo (1970) pointed out that explanations of language development in behaviorist terms had been too heavily influenced by learning theory and too little influenced by language theory. Attempts to explain language behavior, after all, must necessarily depend on the nature of language, on what it is that is being learned. Verbal learning studies, in general, had used language to investigate learning; emphasis on learning in order to explain language seemed to have been less fruitful.

There was also reconsideration and shifting of opinion among those to whom the nature of language and linguistic theory were primary. Bever, Fodor, and Weksel (1965) criticized the theory of contextual generalization proposed by Braine (1963b) as being too closely tied to the surface features of speech. Braine had suggested that language learning depended
upon the child perceiving the positions of words in sentences. Bever, Fodor, and Weksel (1965) emphasized that most of what was important about language was beneath the surface—that the underlying rule system was not directly perceivable and thus not obtainable from actual utterances. However, in Hayes (1970) there were several papers, for example, Bever (1970a), that pointed out that actual speech was, after all, primary evidence for the child. The child necessarily must process utterances that he hears, and an adequate explanation for language development must include a specification of the strategies he uses in processing speech.

The function of imitation for language development has emerged as an important issue. Throughout the century, the tendency for children to imitate the speech they hear has been repeatedly acknowledged and has, at least tacitly, been considered as somehow important for learning language. Recently, views of the importance of imitation have been divided. Behaviorists, on the one hand, saw imitation as a necessary precondition for reinforcement and learning (Staats 1971) or a combination of imitation and reinforcement as relevant to language learning (Sherman 1971). The transformationalists, on the other hand, have argued that the most important information about a sentence is in its deep structure, so that repeating the surface structure would not be helpful (McNeill 1966a; Slobin 1968). In support of the transformationalist claim that imitation cannot be important, Lenneberg (1967) pointed out that it was possible to learn language without being able to speak at all, as in the case of individuals with paralysis of the speech musculature who, nevertheless, understand speech. Ervin-Tripp (1964) compared the spontaneous and imitative utterances in the speech of five children and reported that the same rules of surface word-order described both kinds of utterances.

However, in the study of the spontaneous and imitative speech of six children (Bloom, Hood, and Lightbown 1974), there were marked differences in the extent to which the different children imitated, and there were developmental differences between the spontaneous and imitative speech of the individual children. In the speech of two children, Peter and Jane, almost one-third of their utterances repeated something just said to them by someone else. In contrast, in the speech of two other children, Allison and Gia, fewer than 10 percent of the utterances that occurred were repetitions of a preceding model. The other two children, Eric and Kathryn, were somewhere between these two extremes. When the imitative and spontaneous utterances were compared for each child, there were differences between imitative and spontaneous speech. The individual lexical items and the semantic-syntactic structure in multiword utterances that were imitated did not occur spontaneously; the words and
structures that were productive in spontaneous speech were not imitated. For example, in an eight-hour sample of speech from Jane, mean length of utterance was 1.29, and 42 percent of her utterances were imitative. Of six agent-action phrases, five were spontaneous and only one was imitative, whereas fifteen action-affected-object phrases occurred and only four were spontaneous. In the two instances, there was marked difference from the expected proportion of imitation (.42), in two directions. In six five-hour speech samples, three weeks apart, from Peter, with mean length of utterance increasing from 1.0 to 1.69, there was a statistically significant difference between imitative and spontaneous lexical items that occurred three times or more. Lexical items were either imitative or spontaneous, but not both. Moreover, there was a statistically significant change across the six samples as imitative words became spontaneous, but not vice versa. From the results of this study, it appears that imitation is not necessary for language development, but when imitation does occur it is developmentally progressive and provides evidence of an active processing of utterances relative to the contexts in which they occur.

These results of the analysis of imitative utterances that occur in naturalistic speech are in contrast with the underlying rationale for the use of elicited imitation as a task for evaluating children’s knowledge of grammar (for example, Menyuk 1963a; Rodd and Braine 1971; Slobin and Welsh 1973). In elicited imitation, it is presumed that the child processes the presented stimulus sentence through his or her own rule system, and the resulting imitation reflects what the child knows about a particular structure. In the study of spontaneous imitation by Bloom, Hood, and Lightbown, imitative utterances reflected what the children did not yet know but were in the process of learning. The processes involved in elicited imitation tasks versus spontaneous production are discussed at length in Bloom (1974a).

Linguistic Determinism

A number of studies have emphasized the nature of language and the linguistic code for explaining the course of language development. The linguistic theory of generative transformational grammar (Chomsky 1965) provided a scheme for representing important information about the origin of sentences. A system of integrated rules was proposed for representing how an actual sentence in speech (the form of a spoken sentence) was related to its abstract underlying structure (the specification of the meaning of the sentence). The system of rules in a generative transformational grammar attempted to specify not only the origin of particular sentences but also the interrelatedness of all sentences that are possible in the language. Such a system of rules is a linguistic grammar pro-
posed by a linguist to represent what a speaker-hearer knows about sentences. A linguistic grammar, then, attempts to explain sentences in terms of source or derivational history and represents an hypothesis about mental grammar. The mental grammar is what speakers know about language that makes it possible for them to speak and understand sentences.

The distinction between linguistic grammar and mental grammar has not always been clear, and the two have often been confused (see Watt 1970, for an elaborate discussion of such confusion, and Bloom 1974b). However, for many people, linguistic grammars and, in particular, generative transformational grammar have provided important hypotheses for describing and explaining the data of language development. Brown and Hanlon (1970) provided an account of children's development of truncated and tag-question forms that was strongly tied to the system of rules that linguists have proposed for such forms in adult speech.

Several studies of speech perception by transformational linguists (for example, Garrett, Bever, and Fodor 1966) attempted to determine the psychological reality of linguistic segments by studying how adult listeners process the linguistic units of sentences. Bever (1970a) extended this research to different kinds of studies with small children in an effort to determine the mutual interaction between the child's strategies for speech perception and the actual structure of language itself. Bever proposed a set of processing strategies whereby children were able to retrieve such basic information about sentences as the actor-action-object relations and the interaction between clausal segments. Watt (1970) proposed a somewhat similar processing strategy whereby children analyzed the structure of a sentence by temporally attributing structure to a string of words from left to right. In experiments by Huttenlocher and Strauss (1968), and Huttenlocher, Eisenberg, and Strauss (1968), the easiest sentences to understand were those in which the sentence-subject was the actor of an action. In each of these proposals and in research reported by Lahey (1972), the primary cue used by children for analyzing sentences to obtain their meaning was word order.

Certain basic capacities and information are already attributed to the child who would be using such processing strategies. For example, in order for the child to know that the string of words he hears contains an agent-action-object sequence, he must already know about such relations, that is, about sentences. Such basic linguistic capacities have been largely taken for granted in studies of speech perception and in the linguistically determined theories of language acquisition proposed by McNeill (1970). According to McNeill, the facts of sentences must be available to the child at a very early age, inasmuch as virtually all of his
linguistic behavior depends upon it. McNeill's views were strongly influenced by generative transformational grammar, and he has used Chomsky's (1965) notion of "language acquisition device" to explain child language. Essentially, such a device would include the formal and substantive features which are common to all languages (linguistic universals) and would provide the child with the set of hypotheses which he would presumably need for determining those aspects of language which are specific to the language in his community. Thus, what the child already knows about language determines what he learns about language. The origin of such prior knowledge about language is not at all clear. Chomsky, McNeill, and others have proposed a strong innate component in acquisition—that children are necessarily born with certain linguistic competencies. Bever, Watt, and others have left the question open but have allowed the important possibility that the capacities that are "basic" to the processing strategies of two- and three-year-old children are the product of the child's earlier learning in his first two years.

Linguistically determined explanations of language development have attempted to account for children's behavior in terms of what is known or hypothesized about the target language or about language in general. Thus, the linguistic code itself is seen to be the major (if not the only) determining influence on the sequence of development (as, for example, in the Brown and Hanlon 1970 study), or the mechanism of development (as explained, for example, by McNeill 1970). Other descriptions of language behavior have implicated more than the linguistic code and have offered explanations or described strategies that are cognitively determined.

**Cognitive Determinism**

Piaget has described development as the result of the child's interaction with his environment. The child comes to know about objects and events through his actions on them. Learning language, in this view, depends upon this kind of interaction. The environment in which the child acts includes speech, and his or her interactions must include the speech that is heard in relation to what the child does and the objects and events that he or she sees. Thus, there is complementary interaction among the child's developing perceptual-cognitive capacities and his or her linguistic and nonlinguistic experience. Rather than language being the determining influence on what and how the child learns, what the child learns about language is determined by what the child already knows of the world (see Bloom 1973; Macnamara 1972; Sinclair 1970; Slobin 1971a). This is the point of view that has been emphasized throughout this review chapter.

Slobin (1971a) attempted to bring together the data from develop-
mental studies in a number of languages. He proposed a set of operating principles that would appear to be the child's basis for learning any language. He proposed that, in all languages, semantic learning would depend upon cognitive development and that children will begin to talk about what they know, even though they do not as yet know the adult structure. Thus, sequence of development would be determined at least initially by semantic complexity rather than by structural or formal complexity. In a bilingual situation where the child may have the option to use one or the other language, he will presumably choose the language that uses the less complex linguistic form to express a particular notion if the two languages differ in their means of formal representation of the notion.

Bloom (1973) proposed two alternative strategies for explaining the transition from single words to the use of two- and three-word sentences in child speech. The strategies represent the inductions which children make about grammar, and so they are linguistic strategies for learning about language. As such, they seem to reflect the basic distinction between synthetic and analytic features of languages in general (see Bloom, Lightbown, and Hood 1974). However, which of the strategies a child uses is presumably determined by his or her cognitive development.

Certain conceptions that the child has, for example, notions of the existence, disappearance, recurrence, and so on, of objects, can be conveniently coded by words that are inherently relational ("there," "away," "more") and that combine in direct and linear relation with other words. The meaning of the relations between such words as these and the words with which they are combined is dependent upon the meaning of one of the relational words. For example, "more cookie" as an expression of recurrence depends upon the meaning of "more."

Other conceptual categories such as the relationship between object and location, or agent and object, or possessor and possessed, can be coded by two words in combination, where the meaning relation between the words is independent of the meaning of either of the words, and it is the structural relation between the words that determines meaning. For example, in the utterance "Mommy pigtail," meaning is independent of either "Mommy" or "pigtail." The combination of such words is hierarchical in that there are intervening linguistic categories that specify relationships between individual words. The kinds of distinctions the child has made in his or her organization of experience would appear to influence which of these inductions prevails in his or her early attempts at syntax.

Several experimental studies have demonstrated that what a child knows about an event will influence how he or she interprets a message
about the event. Given the same linguistic message, the child will have
greater or lesser difficulty interpreting it depending upon what the child
already knows about the state of affairs encoded in the message. In a
series of experiments, Huttenlocher and Strauss (1968), Huttenlocher et
al. (1968) and Huttenlocher and Weiner (1971) have demonstrated
that messages such as “The red truck pushes the green truck” will be
responded to with varying delay depending on whether one or the other
or neither of the objects is already placed in a three-space track or ladder.
Thus, the child’s ability to determine the relationship between two nouns
in a sentence is determined in part by how the corresponding objects
appear to him or her in the situation in which the sentence occurs.

A theory of language development must be able to account for different
kinds of data that have emerged in child-language studies. Most impor­
tant, as emphasized throughout this chapter, an explanation of language
development depends upon an explanation of the cognitive underpinnings
of language: what children know will determine what they learn about
the code for both speaking and understanding sentences. Even though
there has been a strong motivation to discover the universal aspects of
language and language development, important individual differences
among children have emerged (as exemplified above and earlier in descrip­
tions of two alternative strategies for emerging syntax). Other differences
among children have appeared in relation to certain group variables that
have been sociologically defined. Both individual and group differences
need to be accounted for in explanations of language development.

Summary

1. There have been two main thrusts in attempts to explain how chil­
dren learn to talk. On the one hand, it was proposed that the course of
language development depends directly on the nature of the linguistic
system and, more specifically, on the nature of those aspects of language
that might be universal and represented in an innate, predetermined pro­
gram for language learning.

2. On the other hand, evidence began to accrue to support a different
hypothesis that emphasized the interaction of the child’s perceptual and
cognitive development with linguistic and nonlinguistic events in his
environment.

3. The issue remains to be resolved, and neither linguistic determinism
nor cognitive determinism has yet received unequivocal empirical or
theoretical support. However, research in semantic development has
led to an increasing awareness of the correlates of language acquisition
in the development of perception and cognition.
Sociological and Cultural Differences

Research in language development that has described children's behavior in relation to cultural and social variables has not been concerned with development in the preschool years, in contrast to most of the research that has been described so far. Thus, educators and psychologists have described the speech of black children in school systems and preschool programs in order to explain underachievement and to plan programs of intervention or remediation. Linguists who have studied the speech of black children were motivated initially by other considerations, primarily their interest in language differences and diachronic language change. The confrontation between educators and psychologists who described the speech of poor black children as deviant, and the linguists who explained that the speech of black children was different rather than deviant, was inevitable (see Williams 1970). Their motivations and their approaches to studying the speech of black children were distinctly different. One group saw the issue as a problem to be solved; the other saw the speech of black children as a linguistic fact to be described.

Studies of the speech of black children that have used standardized tests of one or another aspect of development such as vocabulary or reading readiness have invariably demonstrated performance below the expected "norm." This literature was extensively reviewed by Cazden (1966) and Raph (1967). The tests of language performance that were based upon the language skills of middle-class white children (the "standard" population in the "normative" or "count" studies referred to earlier) produced altogether different results with black children who, quite simply, did not speak the language. The performance of these children on such tests or development profiles was substandard, resulting in the use of such terms as "impoverished," "deficient," or "disordered" to describe their language. Such linguistic deficits were taken to be the cause of learning or reading difficulties and became the focus of remediation (see, for example, Bereiter and Engelmann 1966; Deutsch, Katz, and Jensen 1968; Horowitz and Paden 1973).

The speech of black children has been viewed altogether differently in a number of other studies that have been most recently reviewed by Baratz (1973):

Linguists have also learned that within a large complex society where individuals from different social classes and different ethnicities live in close proximity, they often speak many varieties (dialects) of the same language. One of these dialects may be considered socially more prestigious than the others. It, thus, may be used as the standard for the nation. Although one dialect may be chosen as the standard language, it is
important to realize that this is an arbitrary, or at most, social decision which has nothing to do with that particular dialect's linguistic merits. That is to say, the dialect chosen as standard is no more highly structured, well formed, or grammatical than any of the other dialects. The evolution of a particular dialect as the standard is due to sociopolitical considerations rather than to intrinsic linguistic superiority. Some psychologists, however, have failed to consider the existence of these language variations and have thus mistakenly equated a single surface manifestation of the universal behavior, that is the development of the standard dialect, with the universal itself, that is the development of language.

And Labov (1970) has pointed out:

When linguists say that [nonstandard Negro English] is a system, we mean that it differs from other dialects in regular and rule-governed ways, so that it has equivalent ways of expressing the same logical content. When we say that it is a separate subsystem, we mean that there are compensating sets of rules which combine in different ways to preserve the distinctions found in other dialects (p. 185).

The dilemma in education has had to do with establishing the appropriate goals and determining the best procedures for teaching children whose language cannot be adequately assessed in what may be, essentially, a foreign culture for them. However, the situation has been considerably complicated by social and political issues, so that it is not at all clear at the present time what the relevant variables are for making program decisions for education.

It seems fair to say that the language development of black and disadvantaged children has not really been the object of study. Rather, the speech proficiency of these children at particular points in time has been described and compared with that of other children of comparable age while varying such factors as socioeconomic level, race, geographical origin, sex, etc. There are virtually no published studies that have described the speech of preschool black children, and no studies have looked at developmental changes in the speech of preschool black children. It is somewhat startling that the considerable attention given, in the last decade, to the structure and use of language by school-age and adult black people, on the one hand, and to the cross-cultural study of the development of language, on the other hand, has not stimulated the kind of psycholinguistic study of language development that has been reviewed at length in this chapter.

The presumption on the part of those who have described the speech of black children as substandard or retarded is that their development has been slow. In this view, one might expect, then, that these children follow the same developmental sequence but simply more slowly than children
from middle-class homes. In contrast, the different-but-equal description of black speech by such researchers as Labov (1970); Baratz (1969); Wolfram (1969); and Stewart (1969) would lead to an altogether different set of hypotheses which seem to cry out for investigation. What are the language correlates of sensorimotor development in black children? What are the conceptual distinctions encoded in their use of single-word utterances and in their early two- and three-word sentences? And, most important, is it possible to identify the origins of the distinguishing features of adult black English in the early language of very young black children?

The questions just posed relate to the structure of children’s speech in relation both to the children’s underlying cognitive functioning and to their adult model. Another, no less important, question has to do with the functions of speech that have been identified in the speech of adult and school-age black speakers. According to Abrahams (1970, quoted in Baratz 1973):

The emphasis on effective talking found throughout Afro-America, the demand for copiousness and verbal adaptability on the part of the speaker, the expectation that he will elicit a high degree of verbal and kinesthetic feedback from his audience (feedback that will not only permit him but urge him to continue), the license to repeat and to utilize the entire range of vocal effects, all of these traits and many more are the features of the black English speaking system which must be considered in any discussion of the structure and maintenance of black English.

The particular manifestations of how older black speakers use language have been reported and described by Labov, Cohen, Robbins, and Lewis (1968); Kochman (1972); Hannerz (1969); and Baratz (1973). Studies of how very young children use their speech as they are learning language in the preschool years are rare. Horner (1968) used wireless microphones to record the speech of two three-year-old boys, in their home environments, for two days each. She analyzed the function of their speech according to the Skinnerian verbal behavior categories; she found a high proportion of mands and tacts, and very few instances of echoic and intraverbal behavior. We do not have similar kinds of information from either adult black speakers or middle-class white children.

There is a curious disjunction, then, between the language-development literature and the literature of black English. The language-development literature in the last decade has emphasized the emergence of grammar—the evolution of semantic-syntactic structure in the speech of children less than three years old. However, the beginnings of speech of children from lower-class black homes have not been reported on. Similarly, studies of
the structure and function of black English have looked at the speech of adults and school children primarily, in order to identify and describe black English. None of these studies has been developmental.

One prevailing theme has come out of the controversy between educator-psychologists who want to teach standard English or the relevant "concepts" or whatever they deem to be missing in black children's speech, and linguists who want to preserve black English as a viable, fully developed linguistic system. The difference between the performance of black and white speakers on one or another task is as much cultural as it is linguistic. In order to evaluate the relevance of any particular research statistic, it is necessary to place it within the larger perspective of the child and the milieu from which both he and his speech originated. Thus, for language "difficulty" one can read language "difference"; for "cognitive deficit" one can read "cultural difference." Future research should be less influenced by linguistic, educational, and political considerations and more influenced by sociological and developmental considerations.

Language Development

Summary and Prospect

Reviews of the literature are necessarily selective; a great deal has been only touched on here and much has been unfortunately omitted, for example, developmental phonology and bilingualism. The last ten years has easily been the most exciting decade in research in language development. For one reason, there has been an unprecedented coming together of psychology and linguistics on both theoretical and empirical grounds. And there has also been an unprecedented sharing of information—this has been the decade of conferences and underground "publication." Preliminary reports of research have had wide circulation among others involved in similar kinds of research. As a result, research in progress has had the benefit of relevant findings and issues before publication. There has been extended and occasionally heated disagreement, but, far more important, there have also been shifts in position and orientation.

It is tempting to speculate on the evaluation that will be given to the last decade of research in language development at the close of the 1970s or of the 1980s. After all of the many studies have been sorted out and the evidence sifted, what will remain as the contribution of the 1960s to the study of child language and language development? The speech of a few children was studied in considerable detail; aspects of the speech of a larger number of children were described in somewhat less detail. This was the decade of the search for the underlying system—fired initially by Chomsky's *Syntactic Structures* (1957) and coming around to Piaget's descriptions of the *Psychology of Intelligence* (1960) and *The Construc-
tion of Reality in the Child (1954). This was also the decade of the search for the universals of language development. Important similarities were found in language development in different cultures, but there were also important differences—in the language development of different cultures and among children learning to speak the same language, as well.

This was the decade in which new demands were placed on the accountability of evidence. The former practice of describing a sample of fifty or a hundred utterances was discarded, and the data for analysis often included over a thousand utterances from a particular child during one particular period of time. The data of language development began to include more than just what children said; behavior and context became critically important variables. The audio tape recorder began to give way to the video recorder with the continually increasing demand for more information about the substance and process of language development than could possibly be obtained from just the spoken word.

New questions have been asked; new techniques have been developed; and new evidence has been brought to light. There have been a number of important insights, and a number of blind leads and illusions as well. There has yet to be a final period at the end of any account of one or another aspect of language development. Very aptly, in the beginning, there were Adam and Eve, and Andrew and Gregory, Christie and Hollie, Rina, Seppo, Izanami, Kathryn, Allison. . . .

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