

12 Beyond Communicative Adequacy: From Piecemeal Knowledge to an Integrated System in the Child's Acquisition of Language

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When I began observing and recording the language development of my two daughters in the early 1970s, many of the major landmarks in the acquisition of English were well known: the stage of one-word utterances, the onset of short telegraphic sentences, overextensions of words to inappropriate referents, inflectional overregularizations, and so on. My purpose in collecting data was therefore not so much exploratory as to establish a rich, fine-grained data base for investigating known problems such as the scope and nature of the categories underlying early word combinations. As the children passed the initial stages of vocabulary acquisition and syntactic development, however, I began to notice phenomena I had not been looking for: the onset, at periodic intervals in the age range of about 2 to 5 years, of various kinds of errors in word choice and/or syntactic structure. This took place long after my earlier observations had led me to assume that the forms in question had already been mastered. Some types of errors occurred relatively frequently, others relatively infrequently. Whether frequent or infrequent, however, they were recurrent and systematic. Moreover, as I realized when I began listening with a freshly sensitized ear, the errors were not unique to my home-grown subjects but in fact turn up repeatedly in the speech of other English-speaking children of comparable ages.

At first I thought of these errors as intriguing but isolated oddities in the development of English. The more I have puzzled about them, however, the more I have become convinced that their modest initial appearance is decep-

tive. To account for them adequately in fact requires positing acquisitional processes of considerable theoretical significance. My goal in this chapter is to outline some of these processes and discuss their implications.

The chapter is organized as follows. The first section considers very briefly the kinds of processes that can be inferred to underlie errors that do not set in until after a period of correct usage (hereafter "late" errors). It is argued that the existence of such errors necessitates a careful examination of the question of what it means to "acquire" a piece of linguistic information. In particular, acquisition often seems to be a more extended process than we have envisioned. It may continue long after fully adequate communication has been achieved with respect to a given form, and it sometimes involves covert shifts in the way children have organized linguistic information and related it to other parts of their developing grammar.

The ongoing organization and reorganization of linguistic knowledge is a fascinating phenomenon in its own right (see Bowerman, 1982b). It takes on added significance, however, when we consider its implications for two complex, interrelated issues of the greatest current theoretical importance: the roles played in language acquisition by *meaning* and the child's *intention to communicate*. I therefore defer the discussion of some particular error types until after the second and third sections, in which I summarize a currently influential model of how linguistic forms, meaning, and communication are interrelated in the acquisition of language, point out some challenging problems for this model, and suggest that the notion of "meaning" in language must be reconceptualized before we can hope to solve these problems. In the fourth section, evidence from several types of late errors is marshalled in support of these arguments. A brief concluding section follows.

WHAT CAUSES LATE ERRORS?

Little explicit attention has been paid in the child language literature to the general phenomenon of errors that set in only after a period of correct usage. Nevertheless, every student of language development is well acquainted with one such sequence, the onset of inflectional overregulations (e.g., *goed*, *foots*) only after the child has been using the correct irregular forms (*went*, *feet*) for a while (Cazden, 1968; Ervin, 1964). The accepted interpretation of this sequence is that children start out by learning lexical items, both inflected and uninflected, regular and irregular, as independent items. Cazden (1968) refers to these as "stored fragments . . . which are somehow tagged liberally for semantic information on the verbal and nonverbal context [p. 437]." Later children begin to compare forms and to discover regular relation-

ships — storable as rules — holding among subsets of them.¹ At this point they begin to apply the rules too broadly, and irregular forms are regularized. When the irregular forms later reassert themselves, these forms presumably no longer function as isolates, but rather take their place in the system as exceptional counterparts to their noninflected partners.

This account of the acquisition of inflected forms contains an important insight, namely, that what appears to be “the same” linguistic behavior at two stages of the child’s development may in fact be supported by very different kinds of linguistic knowledge: piecemeal fragments of information about particular forms and how to use them at an earlier time, and a system that interrelates and integrates these fragments later on. Because of this ambiguity of surface behaviors (which, it should be noted, is also found in children’s approaches to nonlinguistic cognitive tasks; cf. Karmiloff-Smith & Inhelder, 1974/75; Strauss, 1982), researchers have wisely tended to exercise caution in crediting children with full adult knowledge of the forms they produce. Usually, however, if a child is found to be producing a word, inflection, or pattern for sentence construction with semantic accuracy and at least moderate frequency and reasonable flexibility with respect to nonlinguistic and/or surrounding linguistic context, we have been willing to conclude that the form has been “acquired,” and we do not look for further development. After all, if the child’s use of the form is virtually indistinguishable from that of the adult, what remains to be done?

Indeed, in some linguistic domains, perhaps nothing. But in other domains, children apparently do not stop at the point where outwardly adult-like behavior has been achieved. Rather, they go on analyzing the elements of their existing repertoires and discovering further relationships and regularities. The result is the gradual transformation of a loose collection of independent linguistic elements, routines, and relatively small sets of interrelated items into a tighter, more structured system that integrates more items and sets of items on the basis of increasingly abstract, overarching rules and relationships. This process is largely covert; the child continues for the most part to speak as before. But, just as in the familiar domain of inflectional morphology, the evidence that it is taking place lies in the occasional error.

What kinds of reorganizational processes do late errors signal? What are the bases for systematization? Most of the errors I have studied seem to reflect changes in the connections the child has previously established between linguistic forms and categories of meaning. This is what makes late errors so

¹Terms like “compare,” “discover,” “recognize,” “perceive,” and “grasp” imply conscious awareness. However, for lack of better terms, they are used in this paper to designate cognitive processes assumed to be wholly unconscious.

relevant to the problem of how meaning and form are interrelated in the acquisition of language, an issue to which we now turn before going on to discuss the implications of some specific error types.

THE PRIMACY OF MEANING IN CURRENT THINKING ABOUT LANGUAGE DEVELOPMENT

In the following discussion, the terms "form" and "meaning" should be construed broadly. Form includes not only surface segments of the language such as words, inflections, and derivational morphemes, but also more abstract constructs such as part-of-speech categories, contrastive patterns of word order or intonation, grammatical functions like subject and direct object, and so on. Meaning should be taken to include not only those notions traditionally considered "semantic" (or "ideational" or "propositional"), but also at least some "pragmatic" notions such as "topic" (the focus here is on the former, however).²

In an earlier era, no causal or facilitative role was ascribed to meaning in the acquisition of linguistic forms. The meanings encoded by or correlated with the distribution of particular forms were either largely ignored in studies of language development (especially in the case of syntax) or considered to emerge in the child as a direct consequence of the learning of language. A striking shift has taken place over the last decade, however. Meaning, far from being considered irrelevant to or determined by language acquisition, is now commonly seen as the key to the whole process.³

According to this more recent view, children possess powerful cognitive skills that enable them to structure and interpret their experiences on a nonlinguistic basis, that is, to develop notions of agency, spatial location, causality, possession, and so on. When language starts to come in, it does not introduce new meanings to the child. Rather, it is used to express only those meanings the child has already formulated independently of language.

²Many investigators have used the term "function" for the joint set of semantic and pragmatic concepts I am calling "meaning." I avoid the term "function" in this chapter because it seems subtly biased toward a view against which I wish to raise objections: that the semantic and pragmatic distinctions that figure in a language (e.g., that covary with or have consequences of various sorts for the selection and combination of linguistic forms) have a very direct relationship with the realization of speakers' communicative goals.

³The sketch given here of a currently prevalent way of viewing language acquisition is perhaps not embraced without qualification by any one investigator. The approach, as a sort of general *Zeitgeist* of the field, has been building up gradually and developing more coherence on the basis of converging arguments and bits of evidence presented over the last 14 years or so by many researchers. Some influential works contributing to its early development include, for example, Bloom, 1970; Bowerman, 1973; Brown, 1973; Clark, 1973, 1976; Nelson, 1974; Schlesinger, 1971; Slobin, 1973.

How are specific linguistic forms acquired? The hypothesis we are considering states that new forms are matched to, or "map onto," preestablished concepts or categories of meaning. These meanings may not be isomorphic with the adult meanings identified with the forms in question; the point is simply that each form is matched to some preestablished meaning, whatever it might be. Once the mapping has taken place, the meaning category guides the child's initial generalizations of the form to novel contexts; that is, the child uses the form only in connection with the meaning that he or she has identified with it. A sketch illustrating this general approach to the developmental relationship between form and meaning is presented in Fig. 12.1, along with some representative hypotheses about specific form-meaning matches in English-speaking children.

What is the motor that drives this mapping process? Here is where communication enters the picture. If language acquisition is seen primarily as a process of mapping linguistic forms onto preestablished meanings, it is a plausible step to the hypothesis that new forms enter children's repertoires in response to their desire or intention to express their meanings. This view is sometimes implicit in the literature, discernible, for example, in the inter-

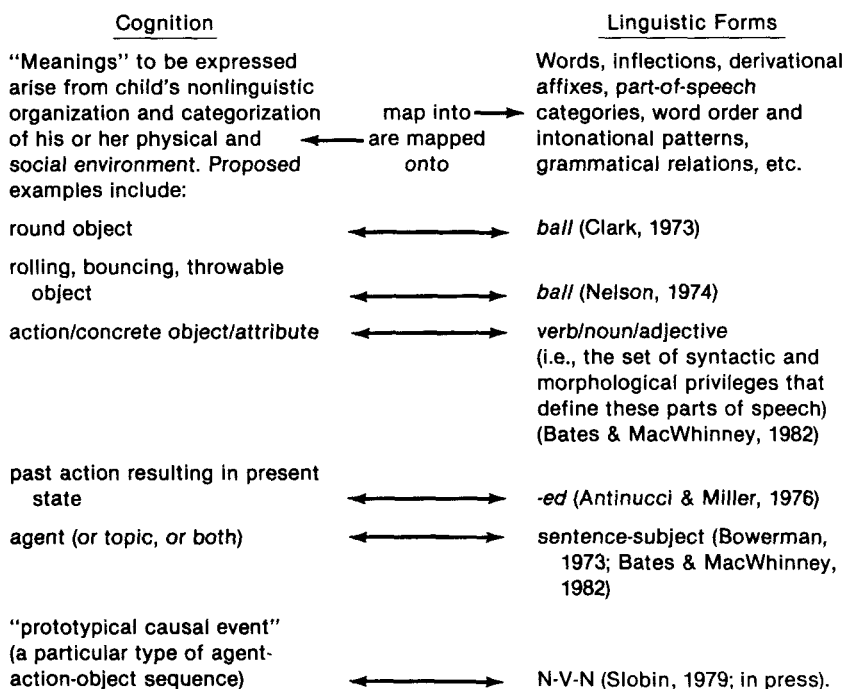


FIG. 12.1 "Forms map onto preestablished meanings" model of language acquisition.

changeable use of the terms “meaning” (or “semantic/pragmatic function”) and “communicative intention.” More explicit proposals have also been advanced (e.g., Bates and MacWhinney’s, 1982, view of the child’s linguistic progress as a series of solutions to communicative problems). The general idea is that the development of new or more differentiated meanings is always in advance of children’s knowledge of the conventional linguistic devices for expressing them. At first they “make do” with whatever nonlinguistic means (e.g., gestures, eye contact) and linguistic devices are available to them. But the “push” from the mounting complexity of their communicative intentions leads them to seek and master ever more elaborate linguistic devices that will allow them to express these intentions more satisfactorily.

SOME PROBLEMS WITH EXPLAINING GRAMMATICAL DEVELOPMENT BY REFERENCE TO LANGUAGE- INDEPENDENT MEANINGS AND THE DESIRE TO COMMUNICATE THEM

The model that has just been sketched is attractive in part because it invokes and interrelates in an internally coherent way a number of themes that have become important in the study of language development (and language more generally) over the last decade, such as meaning, communication, and the way language structure may reflect both nonlinguistic conceptual predispositions and the requirements of a communication system that must be processed in a linearly organized, temporally fading medium. Despite its appeal, however, many serious problems arise when we begin to look closely at some of the model’s assumptions and predictions. I consider questions about formal structure only briefly, and then go more deeply into the problem of meaning.

Form

Are new forms always and necessarily matched to preestablished categories of meaning, or is the child in fact capable of dealing with formal structure without support from meaning? Some of the most interesting test cases for this question are those in which forms of the adult language do correlate with categories of meaning, but only partially. For example, many nouns name concrete objects, but there are nouns that do not, such as *justice* and *kick* (as in *a kick in the ribs*). Likewise, the part-of-speech categories “verb” and “adjective” coincide to some extent with the semantic categories “words for actions” and “words for qualities” (attributes, states), respectively, but many verbs do not denote actions, and many adjectives do not designate qualities. And, to take a third example, many sentence-subjects name an agent who

performs an action (*JOHN walked*), but others do not (*JOHN received a present*; *THIS TENT sleeps five*).

Some investigators working within the framework sketched in Fig. 12.1 have suggested that children exploit partial correlations like these to crack into the formal system; that is, they start out assuming a closer match between a form and its correlated meaning than is actually the case (e.g., Bates & MacWhinney, 1982). If this hypothesis is accurate, children should at first use a given form only in the context of its associated meaning. For instance, they should treat as a verb only words naming actions (where "treat as a verb" would include, e.g., affixing with verb inflections). Once having achieved a working knowledge of a form, however, children would begin to extend its use to other contexts where it is also appropriate but where the associated meaning is absent. This transition could occur gradually, for example, with extension moving from core or prototypical instances of the meaning to "less good exemplars" or metaphorically related meanings, and finally to non-exemplars (cf. Slobin, 1979).

Some aspects of language development that are incompatible with this general approach have been pointed out by Maratsos and Chalkley (1980). These investigators note, for example, that the hypothesis predicts that children should make certain kinds of errors in the early stages of learning about part-of-speech distinctions. Thus, when adjectives of the adult language denote actions or behaviors rather than enduring qualities or states, children should initially treat these words syntactically as verbs. They might, for instance, say *He CAREFULLED the toy* (= was careful with the toy) and *She NASTIED me* (= was nasty to me). Conversely, adult verbs that refer to qualities or states rather than to actions should receive adjectival treatment, for example, *She IS LIKE of him* (= likes him; cf. *is fond of him*); *He IS REMEMBER (of) the movie* (= remembers the movie). Such errors do not seem to occur, however. From this and related evidence, Maratsos and Chalkley conclude that children must be capable of learning forms – even those that correlate partially with categories of meaning – without semantic mediation.

Some experimental evidence that such learning indeed is possible has been presented by Karmiloff-Smith (1979a). The formal domain explored by Karmiloff-Smith was the French gender system, in which masculine and feminine gender correlate, although imperfectly, with sex of referent (in the case of animate referents). Karmiloff-Smith elicited speech from French-speaking children about novel pictured male or female creatures, which she introduced with nonsense species names in contexts free of overt indications of gender. She found that the children's first systematic strategy for assigning gender to the novel nouns had nothing to do with sex of referent, but was based instead on a completely nonsemantic criterion – albeit one that is in fact more reliably predictive of gender in French – the phonological properties of the nouns.

Meaning

So far I have considered only the question of whether formal knowledge is invariably or necessarily acquired with the help of meaning. The answer apparently is no. But there are still more complex problems with the hypothesis that the child proceeds by mapping the formal devices of language only onto already available concepts that strive for expression. Specifically, the hypothesis assumes a relationship between meaning in language and prelinguistic thought, on the one hand, and between meaning in language and communicative intentions, on the other, that is implausibly direct, given considerations of the following kinds.

1. *Selectivity in the Obligatory Mapping of Meanings*

Slobin (1979) discusses at length one reason why language cannot be taken as a direct mapping of thought. This is that languages are *selective* in what they encode, pulling out certain meaning distinctions for obligatory marking and ignoring others that the speaker is presumably equally capable of entertaining. Not only are languages selective, but they are selective in different ways. English speakers, for example, must constantly indicate whether the referents of the nouns in their sentences are indefinite (*a*) or definite (*the*); Finnish, however, lacks articles, and the marking of (in)definiteness is optional. Navaho sentences with verbs of motion or location require attention to the characteristics of the located or moving object(s) (e.g., whether it is roundish, flat and flexible, or a collection of entities) because the appropriate classification must be marked on the verb (Allan, 1977). Some languages distinguish only between one and more than one (cf. English *dog* vs. *dogs*), others require a three-way classification (one, two, more than two), and still others do not require number to be indicated at all.⁴ This kind of variation in obligatory marking means, argues Slobin (1979), that the child needs to learn not only *how* to encode meanings but also *which* meanings to encode: “the child learner needs to determine which subset of notions receives formal marking in his or her native language [p. 7].”

2. *Selectivity and the “Intention to Communicate.”*

Selectivity and variability in which out of all the potential meaning contrasts are obligatorily encoded by a particular language also create problems for the view that progress in the acquisition of linguistic forms is motivated

⁴Recall that the issue here is not what a language *can* encode but what it *must* encode. English, for example, can indicate two entities, as opposed to one or more than two, by the optional use of *two* _____. However, the *grammar* of English *requires* a choice between two contrasting forms of the noun, which distinguish only between one and more than one.

by the desire to communicate. As noted earlier, this model makes no explicit distinction between "meaning" and "the (elements of the) message the speaker wishes to communicate." And indeed, it is only when the two are equated that it makes sense to see the child's acquisition of new forms as driven by an ever-unfolding desire to communicate more, or more effectively. But the effort to make this approach work in the face of significant cross-linguistic variability in what meanings are obligatorily encoded commits us to an assumption that is surely absurd: that language-learning children not only make, without encouragement from language, every meaning distinction that could possibly be relevant in the structure of a natural language, but also that they are spontaneously interested in communicating them all. That is, children must entertain these meanings with sufficient explicitness and with enough desire to convey them to their conversational partners to activate in them a search for some suitable linguistic device with which to encode them.

It is only when we limit our attention to our native language that the equation between meaning and communicative intentions might seem tempting. This is because we are either unaware of the meaning distinctions marked obligatorily in our language or we take them so much for granted that it is easy to imagine that what we say somehow reflects communicative intentions that we generate independently of language. But the obligatory distinctions of other languages often seem exotic and difficult. Consider, for example: (1) the distinction between whether a past event is known by direct experience versus by inference or hearsay, essential to the choice between alternative past tense markers in Turkish (Aksu, 1978); (2) the obligatory four-way classification of nouns in sentences of Toba, a language of Argentina, according to whether the objects to which they refer are in view, out of view, coming into view, or going out of view, and furthermore, if they are in view, according to whether they are spatially nonextended (e.g., a fruit), extended vertically (e.g., a fruit still hanging, or a tree), or extended horizontally (e.g., a table) (Klein, 1979). Can such meanings really struggle for expression in the developing minds of all children, including those in our own living rooms? It seems far more plausible that children learn through experience with their local language that certain meanings must be encoded, whether they are spontaneously interested in communicating them or not (see Bowerman, 1976; Schlesinger, 1977).

3. *Backgrounded Meanings*

Reasons for rejecting the equation between "meaning" and "communicative intention" or "what the child wants to express" go still deeper than the problem of cross-linguistic differences with respect to which meanings are encoded. It is not impossible that, after experience with language, the Turk-

ish speaker's intended message comes to include information about how a past event is known and the Toba speaker begins to feel that it is important to specify the visibility, shape, and orientation of the objects referred to. This would not account for how the child learns the relevant forms in the first place, but it would at least allow us to preserve the belief that "message" and "meaning" are somehow isomorphic in the mature speaker. But meaning is woven into the structure of language in other more subtle ways. In particular, the speaker must control a wide variety of meaning distinctions that govern the applicability or behavior of various linguistic forms but that do not *in themselves* constitute any part of the message to be communicated.

The clearest illustrations of such backgrounded meanings involve what Whorf (1956) termed "covert categories" or "cryptotypes." Cryptotypes, like many other more obvious meanings, involve the classification of the objects, events, relationships, and so forth to which the speaker refers into contrasting categories. Unlike "overt" meaning categories, however, they are not given an explicit formal marker in the sentences in which they figure (an example of an explicit marker for an overt category is -s for plurality in English). Instead, they make their presence felt only indirectly, through what Whorf termed their "reactances," or the constraints they place on the way other forms behave.

Cryptotypic meanings, argued Whorf, typically involve subtle and elusive notions that are difficult to express precisely but that can be apprehended in an intuitive sort of way. One interesting example in English, to which I return in a later section, involves the class of verbs to which reversative *un-* can be prefixed.⁵ As Whorf (1956) pointed out, almost all these verbs (with only a few exceptions, now archaic or semiarchaic) denote "centripetal" actions involving "covering, enclosing, and surface-attachment": "Hence we say 'uncover, uncoil, undress, unfasten, unfold, unlock, unroll, untangle, untie, unwind', but not 'unbreak, undry, unhang, unheat, unlift, unmelt, unopen, unpress, unspill' [p. 71]."

A second covert meaning distinction of English, this time involving lexical appropriateness rather than a derivational process, is the contrast between flexible objects extended in one versus two dimensions. This contrast affects the relative acceptability of collocations of the verbs *fold* with potential direct objects; compare, for example, *fold a blanket/handkerchief/shirt* with *?fold a string/thread/shoelace*.

As a third example, we may refer to the covert meaning invoked by Zwicky (1968) to account for the contrast between verbs that take a marked infinitive in their complement, for example, *persuade/want/plan (to go . . .)*, and

⁵This prefix should be distinguished from the *un-* prefixed to adjectives and past participles functioning as adjectives (*unkind, unbroken*), which has a different meaning (roughly, *not*) and imposes fewer restrictions on the base form.

those that take a present participle, for example, *find/imagine/avoid* (*going . . .*). According to Zwicky's (1968) analysis, "Verbs in the former class . . . refer to a time preceding the (not necessarily realized) state described by the complement, while verbs in the latter class . . . do not imply such a sequence [p. 97]." Some verbs may have both senses, with the consequence that they may take either complement.

Speakers rarely, if ever, have conscious awareness of the covert meaning categories of their language, and it is implausible that these meanings figure explicitly as part of their "communicative intentions" when they produce sentences over which such meanings exert an influence (either by allowing or by blocking certain combinations of forms). Nevertheless, speakers must be credited with controlling such meanings. Among other sources of evidence, we can cite their ability to give firm and relatively consistent judgments about what combinations are and are not acceptable (Zwicky, 1968), even though they cannot ordinarily explicate the bases upon which such judgments are made (at least not without after-the-fact analysis of their own judgments).

Covert categories illustrate in a particularly clear way that "meaning" in language cannot be directly identified with "communicative intentions." But the same point can also be made by reference to more familiar meanings. Consider, for example, "roundness." It is often observed that young children extend the word *ball* to novel referents on the basis of round shape (Clark, 1973). But when the child says *ball* while pointing out or requesting a ball or other round object, does the roundness of the object constitute (part of) the meaning he or she wishes to communicate? This seems unlikely. Roundness plays an important role in the choice of word, but the message itself revolves around the child's desire that the listener should attend to and perhaps act in a certain way on the intended referent. Of course, eventually the child will come to produce utterances in which the communication of roundness is clearly a goal in and of itself as in *Give me the round block (not the square one)*. But it is interesting to note that many of the criteria used by children in their earliest classifications of objects and events (as reflected in their extensions of words to novel referents) are apparently not yet under conscious control (e.g., are not used to guide behavior in sorting tasks), and hence are probably not yet candidate elements of an intended message.⁶

To summarize, the notion of "meaning in language" is not exhausted by an explication of "communicative intentions." A speaker's communicative intentions at the moment of speech can be described as a representation of the objects, events, attributes, relationships, and the like that he or she plans to

⁶See Campbell (1979, pp. 434-435) on this point and his chapter as a whole for relevant discussion of the tendency in studies of language and language development to confuse conscious and unconscious processes (e.g., the distinction between linguistic contents of which speakers have some awareness and those of which they do not).

talk about, along with subsidiary information about what is more important, what is less important, and so on. But the speaker's selection and combination of particular linguistic forms with which to express these intentions are guided by meanings that are not being consciously entertained at that moment and, in many cases, that are never consciously entertained at all. The view of language acquisition as a process of mapping linguistic forms onto preestablished meanings that the speaker wants to express or communicate is ill-suited to explaining this use of backgrounded meanings in the service of other more explicit meanings. Yet this ability is inherent to the knowledge and use of language from first words on, and no theory of language acquisition can be considered adequate unless it accounts for it (see Bowerman, 1983, for further discussion).

4. *What are the Child's Units of Meaning?*

Language does not offer a unique symbol for every discriminably different stimulus. Instead, it functions in terms of categories, or groups of stimuli that are treated as equivalent. The ability to categorize is one of the most basic cognitive capacities and does not in itself depend on language. Nevertheless, the hypothesis that language acquisition proceeds by a process of mapping linguistic forms onto preestablished meanings — by which is understood *categories* of meaning, such as agency, possession and plurality — raises the question of whether children's nonlinguistic experiences lead them to divide up the world either to the extent to which language requires, or into just the kinds of chunks or units needed. This is a complex issue that cannot be considered in detail here (see Bowerman, 1976; Schlesinger, 1977, for further discussion). For present purposes, I consider only two problems: the breadth of the units and their combinatorial structure.

With respect to category breadth, the basic question concerns the range of items that will be treated similarly (e.g., called by the same word or covered by the same inflection). Is *doggie* used as a label for the house pet, for all small dogs, all dogs, or all four-legged creatures? Does *-ed* represent only past events with a lingering aftermath (e.g., *spilled*) or past events in general? It is well recognized that the breadth of the category that a child associates with a particular form may narrow or broaden over time. Consonant with the hypothesis that forms are initially mapped onto meanings established independently of language, the assumption is typically that nonlinguistic biases for categorizing in certain ways will exert their maximum influence early in the history of the child's use of a form, with category boundaries being adjusted later, where necessary, to the requirements of the specific language being learned (e.g., Slobin, in press). However, we shall see that there is also evidence for the use of *language-specific* categories at first, followed only later by influence from categorizational principles not specifically called for by the language being learned.

The second aspect of categorization with special relevance for the hypothesis that language maps onto preestablished concepts concerns combinatorial structure. By this I mean how the language breaks down complex events into smaller conceptual chunks and assigns these chunks to words or other forms. Talmy (1975, 1976, in press) shows that languages differ systematically in the kinds of semantic configurations to which single-word verbs are attached. Consider, for example, events in which one entity moves with respect to another entity along a certain path and in a certain manner. English has many verbs that "conflate" or combine the notion of movement with the notion of manner; in sentences with these verbs, information about path is expressed with a separate word, a preposition. For example, in *John HOPPED/ROLLED/STUMBLED/SWAM into/out of/across the cave, hopped* (etc.) means something like "move (along) in a hopping manner/while hopping." The verbs of Romance languages, in contrast, typically conflate motion with path; manner, if it is expressed at all, is encoded by a separate word. This pattern is suggested by the following possible but uncolloquial English sentences: *John ENTERED (= moved into)/EXITED from (= moved out of)/TRAVERSED (= moved across) the cave (while) hopping/rolling/stumbling/swimming.*

When the notion of causality is added to notions of motion and path, additional patterned cross-linguistic differences can be identified. Slobin (1979), for example, contrasts the verb in the English sentence *Mummy get out telephone* (a 2-year-old's request for his mother to remove a telephone from a cupboard) with the verb in its Turkish equivalent, *Anne telefonu çıkar* ('Mother telephone get-out') in the following way: "the Turkish verb, *çık*, combines change of location and direction in one word [as suggested by the gloss 'to move out of a container'], leaving it to a grammatical suffix [-*ar*] to encode causal agency; the English verb, *get*, combines change of state and causal agency in one word, leaving it to a locative particle, *out*, to encode directionality [p. 5]."

These examples show interesting differences among languages with respect to which combinations of elements are typically treated as units and which elements are handled as additional specifications. But even within languages, there are often alternative ways to distribute elements of meaning across a set of syntactically organized morphemes. Compare, for example, *The news saddened me* with *The news made me sad*; *I bicycled/flew/walked to work* with *I went to work by bicycle/by airplane/on foot*; *I went across the field hopping (on one foot)* with *I crossed the field hopping* with *I hopped across the field.*

These cross-linguistic and within-language options for the way meaning is packaged raise perplexing questions for the hypothesis that forms map onto preestablished meanings, especially given the common corollary assumption that children initially prefer a one-to-one mapping between underlying mean-

ings and surface forms (cf. Slobin's, 1973, *Operating Principle*, "Underlying semantic relations should be marked overtly and clearly"). Does the meaning mapped into English *go in* and French *entrer*, or into English *go down* and French *descendre*, consist of two conceptual units—motion and path—or one? If two units, then English-speaking children would presumably find the mapping process easier than their French-speaking counterparts, because the latter would be stymied in their efforts to give overt marking to each of the two meaning components. If one unit, on the other hand, then English, by "unnaturally" splitting the conceptual package into two pieces, complicates things for the child who must learn it. (Analogous arguments can be constructed for the case represented by English *get out* vs. Turkish *çıkarmak*.) Given the lack of evidence for selective difficulties with the learning of words for everyday meanings such as "going in," "going down," and "getting out," it is more likely that the child's nonlinguistic conception of these meanings is neutral between the alternative linguistic analyses (i.e., it maps equally readily into either one). If this is the case, however, we cannot argue that forms map in one-to-one fashion directly onto preestablished categories of meanings. We must instead postulate an intermediate step in which the semantic categories required by the structure of the language being learned are constructed out of the resources provided by nonlinguistic cognition.

AN ALTERNATIVE APPROACH TO MEANING

The various considerations that have been raised—variability in the way different languages select meanings for obligatory encoding, the role of backgrounded meanings that guide the speaker's selection and combination of forms but that are not in themselves part of the intended message, and cross-linguistic differences in the makeup of the categories to which forms are attached—suggest that the model of the developmental relationship between form and meaning sketched in Fig. 12.1 not only oversimplifies the problem but is in certain critical respects simply wrong. Specifically, there is no room in the model for an account of how children acquire the *meaning structure* of their language. In Fig. 12.1, meaning is sacrificed to form; that is, the explanation of how linguistic forms are acquired is bought by granting the child for free, courtesy of nonlinguistic cognitive development, the meanings they encode. The price we pay for this explanation is too high. I certainly do not dispute that we need to take into account the contribution to language development of the child's nonlinguistic abilities, but at the same time, we must recognize that the way in which a particular language structures meaning is just as much a part of that language as its formal devices; in other words, it is equally part of what the child must *learn*.

In Fig. 12.2, I sketch informally how the model of Fig. 12.1 must be altered to take account of this. Note in particular that meaning (including both se-

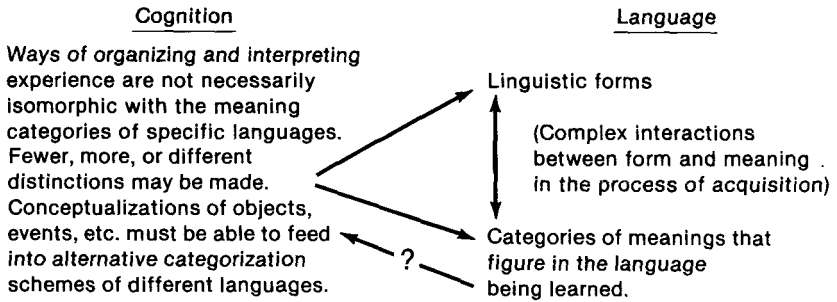


FIG. 12.2 Proposed alternative to Fig. 12.1: An interactional model of the relationship between form and meaning in language acquisition.

mantics and “pragmatic” categories of various sorts that I have not dealt with here, e.g., distinctions of age, rank, setting, etc. that are relevant to the choice between linguistic variants in concrete situations) has been promoted out of cognition into the domain of language proper. New forms can still be mapped directly onto meanings already given by nonlinguistic cognition, as in Fig. 12.1; however, the child can also develop or notice meanings as a consequence of observing the way linguistic forms are used.⁷ Whether or how such meaning categories, once established, affect nonlinguistic ways of categorizing and mentally representing events is still an open question (as shown by the question mark).

EVIDENCE FROM LATE ERRORS FOR THE DEVELOPMENT, REORGANIZATION, AND SYSTEMATIZATION OF FORM-MEANING RELATIONSHIPS IN THE COURSE OF LANGUAGE ACQUISITION

So far, arguments for a model such as is proposed in Fig. 12.2 have been based primarily on theoretical considerations. But late errors provide one important kind of empirical support. In particular, they indicate that the initial

⁷My wording here is intentionally vague in order to sidestep the difficult and controversial issue of whether conceptual distinctions can be learned “from scratch” on the basis of very general cognitive abilities or whether they must be innately present in the child. The case for the latter alternative has been advanced most strongly by Fodor (1975), who argues that concept learning, as a process of inductive extrapolation, presupposes an extremely rich internal language in which hypotheses can be posed about the classes (of objects, events, etc.) across which perceived regularities hold. If Fodor’s approach is correct, the basic explanatory problems faced by developmental cognitive psychologists are somewhat different than they have typically been envisioned, but there is still much to account for (e.g., how more complex concepts get built up through the combination of simpler ones, how certain concepts come to have increased salience over other competing possible ways to group stimuli, why concepts appear to emerge in a developmental order).

matches children make between forms and meanings are relatively fragmented and context-bound.⁸ These matches are serviceable, however; in fact children can often achieve quite adult-like usage patterns without doing more. Nevertheless, they do do more: Elements of the existing repertoire are gradually reworked into form-meaning relationships that are increasingly abstract and removed from the original contexts of learning, both in response to subtle regularities across forms within the language being learned and in response to nonlinguistic categorizational predispositions. The result is a highly abstract system that reflects both language-specific structuring principles and more general cognitive biases that played little or no role in the initial "acquisition" of the forms in question.

Examples of three different genres of late errors are given in support of this claim. Data come primarily from my daughters, Christy and Eva, with occasional comparable examples from other children.⁹

Learning Semantic Categories that Govern/Correlate with the Applicability of Linguistic Forms

As discussed earlier, the hypothesis that forms map onto preestablished meanings holds that children exploit correlations between categories of meaning and linguistic forms in order to learn about those forms. (Thus, for example, "if it is a word that names an action, you can add to it *-ed*, *-ing*, etc.") Another possibility, however, is that children learn the morphological and/or syntactic handling of individual words piecemeal, and only later, after they already have excellent control over these words, discover that items that behave alike morphologically or syntactically may also share an abstract meaning. (Thus, "if it is a word that can take *-ed*, *-ing*, etc., it is likely to name an action.") This is how Brown (1957), in a more Whorfian era, interpreted the ability of preschoolers to guess the referent (action, discrete object, or substance) of novel verbs, count nouns, and mass nouns. Several kinds of late errors support the hypothesis that recognition of abstract form-meaning correspondences often takes place quite late, long after the child is capable of using exemplars of the form fluently (with each exemplar presumably mapped onto a "smaller," less abstract meaning).

⁸See Karmiloff-Smith (1979a) for a similar view, which also derives support from certain kinds of late errors, in this case made by French-speaking children in experimental settings.

⁹The language development of Christy and Eva was followed closely from the time of first words (about 12 months) with daily diary notes and periodic taping of spontaneous speech. Most of the reported errors were recorded by hand, always immediately after they were produced. Each error type is also represented in my records by examples gathered from a number of other less extensively studied children in comparable age ranges. I am grateful to Mabel Rice for data from Mindy, reported in Table 12.1, and to Charlotte Ruder for data from Scott, reported in Table 12.3.

Verbs Prefixable with Un-

One example of a form-meaning correspondence that may often be recognized only late involves the covert category associated with reversative *un-* prefixation, discussed earlier. Children learn many legitimate *un-* verbs (e.g., *untie*, *unbuckle*, *unfasten*) and use them appropriately for at least 1 to 2 years before they show signs of having analyzed them into two components. Evidence that the analysis has taken place is that the child starts to produce novel reversative verbs prefixed with *un-*. Although some children appear to limit their coinages to verbs of the appropriate semantic category right from the start of productivity, others clearly do not (Bowerman, 1982b).

Christy's production of novel verbs prefixed with *un-* went through two distinct stages. At first, *un-* was prefixed indiscriminately to verbs of a wide variety of semantic types including, as in the first of the following examples, those having meanings directly *opposite* to the covert category of actions of "covering, enclosing, and surface attachment." For example:

1. C, 4;5 (C has just asked why pliers are on table)¹⁰
 M: I've been using them for straightening the wire.
 C: And *unstraightening* it? (*unstraightening* = bending)
2. C, 4;7 (C is very angry with M for denying a request)
 C: I hate you! And I'll never *unhate* you or nothing!
 M: You'll never unhate me?
 C: I'll never like you.

Similar examples are: *uncome* (= stop coming); *undizzying* (= becoming not dizzy).

After many months, however, *un-* prefixation gradually became limited to verbs of the "right" semantic type, as in these examples:

3. C, 5;1 (M is working on a strap of C's backpack)
 M: Seems like one of these has been shortened, somehow.
 C: Then *unshorten* it. (= lengthen)
4. C, 5;1 (C has stepped on a toy road sign shaped like a triangle, squashing the angles out of it)
 I *unbended* this with [= by] stepping on it. (= straightened)
5. C, 7;11 (C taking a stocking down from the fireplace)
 I'm gonna *unhang* it.

Other late coinages involving verbs of the right semantic category, by both Christy and Eva, include *unbury* (= reverse action of enclosing by burial),

¹⁰Age given in years; months. In this and subsequent examples, C = Christy, E = Eva, M = Mommy, D = Daddy.

uncapture (= release), *unsqueeze* (= loosen), *untight* (*untighten* = loosen). See Bowerman (1982b) for further examples and discussion.

Notice that all these examples are errors from the adult point of view. But the later ones are more sophisticated, for they show that the child has done further analysis of the semantic characteristics of the set of “real” verbs prefixed with *un-* that she has learned from other speakers. A critical challenge for those who invoke “communicative need” to account for change and progress in language development is to explain why children “bother” to identify this kind of correspondence between a form and an abstract meaning, given that: (1) they do not need it in order to learn or use the *un-*verbs in the English lexicon;¹¹ (2) it is unlikely that adult reaction to coinages selectively encourages errors such as those in examples 3–5, but discourages those like 1 and 2. Apparently children are sensitive to structure and regularity in language regardless of whether the detection of it wins them any communicative advantage, either immediately or in the long run.

Talking About Manner of Causation

A second piece of evidence for children’s formulation of abstract categories of meaning that correlate with linguistic forms involves the expression of causal relations. Consider phrases such as *pull your socks up*, *cut the string off*, *chop the tree down*, *eat your cereal allgone*, and *wipe the table dry*. Children begin to produce simple sentences containing such phrases as early as 2 years, and do so with enough flexibility that there can be no thought of “unanalyzed units” – that is, they vary the noun phrases naming the objects acted upon and also combine (for example) *pull* not only with *up* but also with *down*, *out*, *in*, and so on, as the context demands, and *up* (etc.) not only with *pull* but also with *push*, *pound*, and so on. To all outward appearances, they have excellent control over sentences like these. In the case of Christy and Eva, therefore, I was startled when well over a year later, sentences such as those shown in Table 12.1 started to occur (similar examples from other children are also included).

In the linguistic literature concerning sentences of this sort, two basic types of analysis predominate. One interprets phrases like *pull up* and *chop down* as two-part verbs; sentences containing them are considered simple (i.e., composed of a single proposition) (e.g., Chomsky, 1962). According to the other analysis, in contrast, such sentences are complex: At an underlying level they consist of two separate propositions, one specifying a causing event (e.g., [(You) pull (on) your socks]; [Daddy chops (on) the tree]) and the other specifying a change of state or change of location that results from this event

¹¹ Recall that children may already have been using a number of them quite appropriately for a long time – about 3 years in Christy’s case – before showing signs of recognizing that they have a semantic coherence.

TABLE 12.1
Errors in the Expression of Cause and Effect Relations

-
1. C 3;8 I *pulled it unstapled*. (after pulling a stapled book apart)
 2. E 6;0 His doggie *bited him untied*. (telling about a TV show in which a dog bites a rope, freeing its master)
 3. E 3;9 A gorilla captured my fingers. I'll *capture* his whole head *off*. His hands too. (as she plays with rubber band around fingers)
 4. Andrea 4;3 When you get to her, you *catch* her *off*. (while on a park merry-go-round with doll next to her; wants a friend standing nearby to remove doll when doll comes around to her)
 5. C 6;2 It's hard not to knock them down 'cause whenever I breathe I *breathe* them *down*. (having trouble setting up a paper village)
 6. Mindy 5;6 Are you *washing* me *blind*? (as mommy wipes corners of her eyes)
-

Similarly: *I'm patting her wet* (by patting her, cause her to become wet); *Feels like you're combing me baldheaded* (by combing [my hair], cause me to become bald-headed); *I'm gonna jump it down* (by jumping on it, cause it to go down); *Don't drive off my feet* (by driving over my feet, cause them to come off); *Untie it off* (by untying it, cause it to come off); *She choked me backwards to the chair* (by choking me, caused me to move backwards to the chair).

Note. From Bowerman (1977, 1982b).

(e.g., [your socks come up]; [the tree falls down]) (Fillmore, 1971; Talmy, 1976). The causing event and resulting event can be quite diverse; that is, many unusual combinations are acceptable in adult speech, such as *The locusts ate the prairie brown and bare* (from a Laura Ingalls Wilder book). "Two-part" verbs like *pull up* are simply very common combinations.

When, following the second analysis, we think of so-called two-part verbs as reflecting a much larger pattern of juxtaposing a causing event with a resulting change of state or of location, we see that the early appearance of productivity with these forms in child speech is misleading. This productivity is in fact limited to types of combinations of causing events and resulting events that children often hear described with sentences of this structural pattern in adult speech. Novel sentences can be produced on the basis of knowledge of particular verb-result complement pairs. But the onset of errors like those in Table 12.1 indicates that the child has gone beyond this piecemeal approach and now recognizes an overarching pattern, a way in which these various sentences are similar both in terms of their abstract semantic configuration and their syntactic structure. Only now is the child for the first time in a position to create truly novel exemplars cut to the same pattern. Many of the new combinations are in fact perfectly grammatical (e.g., *Don't hug me off my chair*, where it is unlikely the child has ever heard a sentence encoding an event in which *hugging* was an action that caused the hugged entity to come *off* something). But others, such as those in Table 12.1, violate certain constraints on how freely the pattern can be realized (see Bowerman, 1977, 1982b, for discussion).

More on the Expansion of Existing Meanings

The two examples just discussed indicate that the child can come to recognize that diverse "small" meanings she has thus far treated independently from one another share a more abstract class meaning and that this class meaning correlates with a certain morphological or syntactic treatment. In these cases, the evidence that the child controls the class meanings is that she *overregularizes*; that is, she applies the formal treatment to words or configurations of forms that instantiate the class meaning but that for one reason or another are exceptions to the treatment.¹² The process of building class meanings that encompass hitherto separate, less abstract meanings can produce symptoms other than overregularization, however. In particular, it appears to be implicated in the onset of semantically based word substitutions. These are errors in which the speaker, instead of using the form that is semantically called for, produces another form with a different but related meaning (Bowerman, 1978, 1982c).

Substitutions of semantically related words are relatively common in adult speech, for instance, *I really LIKE to – HATE to get up in the morning; Not Thackeray but someone who wrote BELOW Thackeray – BEFORE Thackeray* (Fromkin, 1971; Fay & Cutler, 1977). It has been proposed that these errors occur because of a breakdown in the process of sentence production (Fromkin, 1973; Laver, 1973; Nooteboom, 1969). According to this hypothesis, the speaker's plan to talk about something activates a set of candidate lexical items and syntactic arrangements, together with their associated phonology. At this point, more lexical items may be activated than will be ultimately selected. In this case, the speaker must implicitly evaluate competing items and select the one that is optimal, rejecting the rest. Ordinarily this goes smoothly, but occasionally there is a minor lapse and a semantically inappropriate competitor slips through in place of the conventional choice.

In Christy's and Eva's speech, substitution errors involving certain relational words such as verbs, prepositions, adjectives, locative particles, and the prefix *un-* were recurrent (see Table 12.2). The onset of errors like these was preceded by a period ranging from a few weeks up to 2 years during which both the "target" word (or morpheme) and its replacement (substitutions were often reciprocal) were used productively in semantically appropriate contexts and never interchanged. This sequence suggests a process by which initially independent words draw together in meaning, such that mean-

¹²Notice, however, that the effects of the discovery of the class meaning are different in the two cases. For *pull up* and the like, the discovery leads to greater productivity than existed previously (as in the case of inflectional overregularizations, e.g., *foots*); for *un-*, however, the result is a *restriction* of a previously more indiscriminate productivity.

TABLE 12.2
Some Genres of Recurrent Semantic Substitution Errors

Make/Let

1. C 3;6 But usually puppets *make*—let people put their hands in.
(disagreeing with M's use of the word *puppet* for dolls with toilet-paper roll bodies)
 2. C 3;9 *Make* me watch it. (begging D to let her watch a TV show)
 3. C 3;6 I don't want to go to bed yet. Don't *let* me go to bed.
(after M has told her she must go to bed)
 4. C 3;8 How come you always *let* me wear those?
(as M puts C's shoes on; she had wanted another pair)
-

Put/Give

5. C 3;4 You *put* the pink one to me.
(request for M to give her the pink one of two cups)
 6. E 2;4 We're *putting* our things to you.
(to D, after M has told C and E that it's time to "give" D their Father's Day presents)
 7. C 4;1 Whenever Eva doesn't need her towel she *gives* it on my table and when I'm done with it I give it back to her.
 8. E 2;7 *Give* some ice in here, Mommy. Put some ice in here, Mommy.
(pointing to ice crusher)
-

Spatial Words/Temporal Words

9. E 3;9 Can I have any reading *behind* the dinner?
(= will you read to me *after* dinner?)
 10. E 4;10 Today we'll be packing 'cause tomorrow there won't be enough *space* to pack.
(= *time*; the day before the family is to leave *on* a trip early in the morning)
 11. C 7;2 Do we have *room* before we go to bed for another reading?
(= *time*; M has been reading aloud in the evening; just finished book)
-

Verb + Particle/Un- + Verb

12. C 5;6 . . . so I had to *untake* the sewing.
(= *take* the sewing/stitches *out*; telling about sewing project at school)
(Similarly: *unpull* [pants] = *pull* pants *down*; *unget* [a knot] = *get* a knot *out*)
 13. C 4;5 (Wants to move electric humidifier): I'll get it after it's *plugged out*.
(Shortly after): Mommy, can I *unplug* it?
(Similarly: *tuck* [a blanket] *out* = *untuck*; *tangle out* = *untangle*; *hook out* = *unhook*)
-

Note. From Bowerman (1978, 1982b, 1982c).

ing representations that previously activated only one word now activate one or more other words as well.

In virtually all cases of recurrent substitutions, the "target" element and its replacement can be seen as alternative realizations of a more abstract meaning, that is, as sister meanings taxonomically subordinate to the same superordinate concept.¹³ For example, *make* and *let* both specify causation, but differ in the precise nature of that causation (roughly, active vs. passive or "permissive"). *Put* and *give* both specify an act in which an agent causes something to change location, but they differ in whether the new location is animate or not. *Behind* and *after* specify analogous positions in a sequence, but in the spatial and temporal domains, respectively. And two-part verbs with *off/out/down/apart* and so on, like verbs prefixed with *un-*, all specify actions involving the separation or spreading out of parts.

What leads to competition between forms whose meanings are taxonomically related at a higher level of abstraction, when both the existence of separate forms and the child's own past history of correct usage would seem to predict that the individual meanings associated with the forms should remain apart? This is too complex a question to discuss fully here (see Bowerman, 1982c, 1983). However, it is intriguing to note that even though the meanings involved are formally distinguished in English by the use of separate morphemes, their close semantic relationship is attested to by the fact that they are often treated as equivalent in the formal structure of other languages. For example, some languages do not formally mark the distinction between animate and inanimate goals that is observed in *give* versus *put* (Lyons, 1967), and some languages create causative verbs with a morpheme that is indeterminate in meaning between active causation (*make*) and permissive causation (*let*) (Comrie, 1976).

In some cases, there may be no languages that encode with a single form the meanings that substitution errors indicate are similar for children beyond a certain age. Nevertheless, there may still be corroborative cross-linguistic evidence that the meanings are closely related: Often the semantic domain defined by the substitutions (i.e., the class meaning shared by the competing forms) is "divided up" by different languages in ways that suggest an underlying coherence masked by a somewhat arbitrary language specificity in assigning subparts of the domain to different formal classes. The domain of "acts of separation" provides a good example. English shares with Dutch certain cognate formal devices for encoding such acts and often uses them similarly: e.g., English *UNload* and *cut OFF* vs. the Dutch equivalents *ONTladen*

¹³The superordinate semantic category that subsumes the more specific meanings of two or more words that substitute for each other may in many cases be best described as having a "family resemblance" structure (Rosch & Mervis, 1975), that is, definable in terms of a set of recurring semantic elements, not all of which are reflected in each submeaning.

and *AFknippen*, (*knip AF*). However, sometimes these devices cross over unpredictably; e.g., English *undress*, *unpack*, and *unhook* vs. Dutch *kleed uit* 'dress out,' *pak uit* 'pack out,' and *haak af/uit* 'hook off/out'; and English *slip out* vs. Dutch *ontglippen* 'unslip'. (Compare these crossovers with errors 12 and 13 in Table 12.2.)

Cross-linguistic evidence of these types indicates that children's recurrent substitution errors may arise from deep-seated cognitive predispositions toward recognizing certain kinds of similarities among events or relationships, regardless of whether these events or relationships are formally treated as equivalent by the lexicon, morphology, or syntax of the language they are learning. This might at first glance appear to support the notion that linguistic forms map onto meanings that are worked out independently of language. But notice that the effect of the classificational biases reflected in the substitution errors I have discussed is *not* observed in the *earliest* stages of language acquisition. To the contrary, in these cases, the child starts out following the very specific form-meaning mappings exemplified in her local language. Only much later, long after she is using the forms in question fluently, is she apparently influenced by more general, nonlinguistic categorizational tendencies. The existence of such sequences, along with evidence for the converse, more expected process whereby "universal" categories of meaning are reflected in children's earliest uses of forms (Slobin, 1979, in press; Bowerman, 1983), indicates that there is a complex interplay in language development between the effects of nonlinguistic cognition and experience with the language being learned.

Breaking Down Global Meanings

In the two immediately preceding sections, I have considered some late errors that seem to reflect processes by which the child formulates class meanings that subsume smaller, previously independent meanings. There is also evidence for a somewhat complementary process of change: the splitting apart of meanings that have functioned earlier in the child's system as unitary conceptual packages.

The relevant errors are of two related types. In *overexplicit marking*, children move from a period in which they routinely encode a given idea with the same word an adult would use to a later period in which they occasionally, or in some cases often, express this meaning with a set of forms that in essence "decompose" it into two or more smaller units, each with its own explicit formal marker. Karmiloff-Smith (1979b) has observed this phenomenon in French-speaking children; one interesting example is the occasional replacement of appropriate noun phrases such as *mes voitures*, 'my cars,' by clumsy paraphrases such as *toutes les miennes de voitures*, 'all (totality) the (plurality, definite reference) mine (first person possessive; plurality of possessed

items) of cars,' in which the several elements of meaning that are implicit in *mes* are spelled out in detail. Examples from my own data (Bowerman, 1982c) include the replacement in the child's speech of contextually appropriate, single-word causative verbs like *drop*, *put*, and *break* by periphrastic forms (e.g., *I drop it* → *I make it fall*; *Would you put my shoe on* → *Would you make my shoe come on?*). Here, a complex causative meaning has been split into two conceptual components. One is an abstract notion of causation, marked with *make* (or sometimes *get*); the other is the caused event or state of affairs itself, usually encoded with an intransitive verb or an adjective.

The second type of error suggesting the breakdown of meanings that initially form a single conceptual unit involves *redundant marking*. Again, there is first a period in which the child uses the conventionally appropriate word for a given notion. This is followed by a period in which he or she occasionally or often adds to this same word another morpheme, which encodes separately an element of meaning that, from the adult point of view, is already incorporated into the original form. Some examples of redundancies that followed initially correct usage are shown in Table 12.3.

The precise cause of overexplicit and redundant marking in child speech is unclear. Karmiloff-Smith (1979b) proposes that such errors reflect children's efforts to come to grips with meaning distinctions to which they have become newly sensitive by giving each distinction its own "external handle." This explanation invokes the principle of one-to-one marking; that is, it assumes that there is push from within to give a separate marker to each unit of meaning (of which the speaker is aware) until a later point when the child can go back to "allow[ing] one external marker to convey several pieces of information" (Karmiloff-Smith, 1979b, p. 112).

An alternative explanation (Bowerman, 1981) links the errors to the semantic substitutions discussed earlier. Errors such as the use of *put* where *give* is needed were described in terms of the competition at the moment of speech between two lexical items, both of which are "activated" by the meaning the child is attempting to encode. In the case of overexplicitness, the competition is not between two lexical items but rather between a lexical and a syntactic way to accomplish approximately the same thing; the syntactic method happens to win out in a context in which the lexical variant is preferred by adults (the converse error, use of a single word where a syntactic construction is needed, also occurs, cf. Bowerman, 1982a). Redundant marking results when two simultaneously activated forms, one a word and the other usually a bound morpheme, are inappropriately combined within the boundaries of a single sentence. (These errors are thus similar to lexical "blends" involving semantically similar words, such as *intertwined*, from *intertwined* and *mingled*.)

Regardless of which explanation is preferable—a cognitive "push" to mark each meaning element separately versus competition between alternative

TABLE 12.3
Some Genres of Redundant Marking

Un- + Verb (Single Word or Two-Part) that Already Encodes a Reversative Act of Separation (Bowerman, 1981, 1982b)

1. C 4;11 Will you *unopen* this? (= *open*; wants D to take lid off styrofoam cooler because she can't)
2. Scott 5;2 How do you *unbreak* this? (= *break*; trying to pull sheet of stamps apart)
3. E 3;5 How do I *untake* this off? (= *take this off*; trying to get out of swimsuit)
4. E 4;7 (holding up chain of glued paper strips)
E: I know how you take these apart. *Unsplit* them and put 'em on.
M: How do you unsplit them?
E: Like this. (pulling a link apart)

Enchoative -en with Verb that Already Encodes Change of State (Bowerman, 1982a)

5. E 3;6 It *smoothens* the water out. (stroking wet stomach with washrag in tub)
6. E 4;11 Julie, will you *close*n the yellow so I can use it? (painting with a friend; worried that yellow paint will dry out if not kept closed)
7. C 6;0 First they look like they're wet and then they *fluffen* out. (of newly hatched chicks)
8. Matthew, Will you *straightenen* this out, please? (handing adult a scrunched-up paper cup; note double marking with *-en*)

Turkish: Causative Suffix Added to Verb that is Already Causative (Slobin & Aksu, in press)

9. Adult: *Kim kes - ti onu*
who cut-past it-accusative
Child *Ben kes -tir- dim*
2;3 I cut-causative-past
Intended meaning: "I cut (it)."
Literal meaning: "I had (someone) cut (it)."

forms with closely related meanings (perhaps both will be needed to account for the full range of errors) – it is important in the present context to note that both accounts postulate the *breakdown* of meanings that are initially matched to given forms in a more global way. This is an explicit part of Karmiloff-Smith's proposal. And the "competition" account also appears to require it, for the following reason. Before morphological devices or certain syntactic patterns (e.g., the periphrastic causative) can become productive, they must be associated with meanings that are independent of particular lexical items. That is, they must be conceptually "free" enough to combine with the meanings contributed by the variety of lexical items with which they can be juxtaposed. (Thus, for example, Turkish *-tir* and English *make* add "causation" to the meaning of the verbs with which they combine; English *un-* and *-en* add "reversal" and "transition into a new state," respectively.) It is, moreover, reasonable to assume that speakers do not make creative use of such a device or pattern in the course of speech production unless they are actively

entertaining the meaning to which it is linked. This means that in order for competition to occur at the moment of speech between a single lexical item and a productive syntactic or morphological device, the meaning associated with the lexical item must have, as a subelement or feature with considerable conceptual independence from the rest of the meaning package, the meaning that is associated with the device. Otherwise, the device would not simultaneously be activated. The initial absence of errors of redundancy and over-explicitness, often until long after the relevant productive devices are already part of the child's repertoire, suggests that the requisite conceptual partitioning of a word's meaning is often achieved only after a period in which the meaning is represented in a more global, "unanalyzed" way.

CONCLUSION

The error types discussed in the preceding sections show some of the ways in which the relationship between forms and meanings can change in the course of language development: matches between individual words or phrases and their specific meanings can "join up" as common instances of a match between a more abstract form and a more abstract class meaning; class meanings can develop to interconnect previously independent forms even in the absence of a shared, abstract "matching" form; and the meanings initially matched to words as unanalyzed wholes can subsequently be broken down or reanalyzed into a set of conceptually independent components.

These changes take place after the child would ordinarily have been credited with having "acquired" the forms in question. This indicates that achieving fluent, productive use of a form and achieving adult-like knowledge of its structure are not necessarily isomorphic. Young children know what to do with particular words or groups of words, and they know many syntactic and morphological patterns, but they have not yet recognized many of the deeper relationships and regularities of the language they are learning. To judge from the time of onset of errors of various types, the work of discovering these systematicities occupies the child during most of the preschool years and even beyond.

Evidence for the reorganization and progressive deepening of linguistic knowledge has implications for several theoretical issues. Two that have been considered in this paper are the role of communication and the role of meaning in the acquisition of language. With respect to communication, I have argued that the currently prevalent invocation of "communicative need" to account for the child's linguistic progress is insufficient. How can it explain the child's further analyses of linguistic forms that are already well under control for purposes of everyday communication (see also Karmiloff-Smith, 1979a, 1979b), especially when the primary behavioral evidence of these analyses is

the onset of errors where there were none before? The onset of late errors is also difficult to square with other interpretations of the driving force behind progress in language acquisition, such as parental correction and reinforcement or children's perception of a mismatch between the predictions of their own mental grammars and adult speech. This is because both of these explanations predict and can interpret only change in which children go from *incorrect* to *correct* usage, not, as in the case of late errors, change in the reverse direction (Bowerman, 1982c).

What shall we conclude from this? Over a decade ago, Brown (1973) discussed the question of whether linguistic progress comes about through selection pressures of various kinds and, in light of the lack of positive evidence, proposed "a radically different possibility . . . that children work out rules for the speech they hear, passing from levels of lesser to greater complexity, simply because the human species is programmed at a certain period in its life to operate in this fashion on linguistic input [p. 412]." I believe that the evidence presented in this paper strongly supports this general conclusion and would add only the qualification that it is not yet clear whether there is a "critical period" for analyses of the types discussed in this paper.¹⁴

With respect to meaning, I have pointed out some difficulties with the currently prevalent view that language acquisition is a process of mapping linguistic forms onto meanings already worked out on a nonlinguistic basis. This view is certainly well justified in emphasizing the importance to language acquisition of the child's cognitive development and conceptual predispositions, but it is deficient in its implicit assumption that "meaning in language" is isomorphic with what the child knows on a nonlinguistic basis (and wants to communicate). Meaning in language is undeniably dependent on nonlinguistic cognition, but it is at the same time a highly structured and conventionalized system. This means that children cannot afford to prejudge what meaning categories will be important any more than they can afford to prejudge the formal linguistic devices with which they will have to deal. Both are equally a part of what children must learn. Because forms and meanings are often intricately interrelated, with each one defining the boundaries of the other, we can expect that the transformation of children's knowledge of the world into the categories of meaning that figure in their local language involves complex interactions between linguistic input and nonlinguistic biases and constraints. And indeed this is precisely what late errors suggest. How this process takes place is an aspect of language development that we have

¹⁴For evidence that there indeed is a critical period at least for the decomposition of lexical items into patterned sets of semantic/morphological components, see Newport (1981). Newport reports that errors indicating sensitivity to sublexical semantic structure in speakers of American Sign Language occur almost exclusively among those who have acquired ASL as a native language. Older learners, in contrast, acquire and retain signs as "frozen," unanalyzed units.

barely begun to explore, however. I hope the coming years will see more attention paid to this fascinating puzzle.

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