From the Garden of Eden to the Tower of Babel

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This essay is a frankly autobiographical excursion, setting forth a bit of my odyssey from the "Garden of Eden" studies of the language development of Adam and Eve at Harvard to the "Tower of Babel" of crosslinguistic studies of acquisition carried out at Berkeley. I hope it is of some interest as a partial documentation of the intellectual world in which the modern study of child language began to develop. My involvement in that development began as a graduate student at Harvard in 1962, when Roger Brown gathered a small group of people to embark on a new endeavor, armed with the technological advances of portable tape recorders and transformational grammar. Ursula Bellugi and Colin Fraser were to be visiting two little children to record their speech, and the research group was to be involved in following the progress of these children as they constructed the grammar of English. In the following self-indulgence of autobiography, I try to reconstruct something of the atmosphere and the goals of our meetings at the Center for Cognitive Studies over two decades ago.

THE GARDEN OF EDEN

The children, of course, were "Adam" and "Eve" (later to be joined by "Sarah," following Roger's sequential Biblical naming scheme). The Center for Cognitive Studies, in addition to Brown's project, included George Miller's beginning research on the psycholinguistics of sentence processing—the first attempts to bring transformational grammar into the laboratory, and Jerry Bruner's grafting of Piaget and Vygotsky onto American roots. Eric Lenneberg...
was lecturing on biological foundations of language. And at the other end of
"Mass. Ave.," Noam Chomsky was lecturing at MIT on new approaches to the
study of grammar, with implications for the study of mind. The task for the day,
in George Miller's terms, was to rescue that four-letter word, mind, from the
status of taboo term in American psychology.

Roger has described our discussions of the speech transcripts of Adam, Eve,
back to 1962–63, he says in that book:

> During the first year of the project a group of students of the psychology of language
met each week to discuss the state of the children's construction process as of that
date. The regular participants were: Jean Berko-Gleason, Ursula Bellugi, Colin
Fraser, Samuel Anderson, David McNeill, Dan Slobin, Courtney Cazden, Richard
Cromer, and Gordon Finley. We had wonderfully stimulating, light-hearted discussions.
Anyone in developmental psycholinguistics looking over the membership of this seminar will realize how bounteous that year was (Brown, 1973, pp. 52–53).

He goes on to say:

> Long before the end of the first year the children got way ahead of the seminar.
Their records were far too rich to be analyzed in a two-hour session. It became clear
that a fine-grained analysis was a big job and had to be undertaken by one person.
Even then only a fraction of the data could be examined. Still I was determined
to make the effort because I had not set out to create an immense archive that no one
would use.

The result, so far, has been the detailed analysis of the first two stages of
development in A First Language, and detailed, unpublished analyses of later
stages—a warning to anyone who would take on such research lightly (but also
an inspiration to those who would take it on seriously). (As an aside, let me
mention that Roger certainly did not create "an immense archive that no one
would ever use." I can't think of any researcher who has been so generous with
his data, and I've lost track of the dissertations and papers that have explored
various aspects of the speech of these three children and their parents.)

In preparing these retrospective observations, I have spent some time going
over my notes from those meetings of the first year of the project. Two things
stand out: the extent to which our guiding questions were shaped by transforma-
tional grammar, and the ways in which research directions of future years kept
appearing in the margins of our discussions.

But first of all, what is evident in those notes is a sense of wonder, the wonder
that comes from looking at something for the first time, without knowing what
you may find. In thinking back on that feeling, the closest intellectual and
aesthetic experience I can compare it to is the amazement I felt in an introductory
zoology lab when I cut open my first mouse and saw all its organs lying neatly in
place. We had not listened to extensive tape recordings of child speech before,
but had read diary studies. New dimensions were raised by the addition of full,
unedited auditory records. For example, in my notes from the second week of
our research meetings, in October 1962, I find the surprized observation:

> Much repetition. This must be an important aspect of language learning. Often with
rising inflection, as if making sure of pronunciation and meaning.

But much of what is in those notes is now familiar. And the fact that the
findings of those first years now seem familiar attests to the cumulative nature
of child language study. We have learned something about the acquisition of Eng-
lish, and similar patterns have repeated themselves in enough children, in
enough studies, to give us a feeling of secure knowledge. The wonder is still
there—but it is no longer the wonder of novelty. As our knowledge of children's
accomplishments grows, we are faced with deeper problems and unsolved
puzzles.

In those years of 1962–63, we were clearly oriented to current questions of
transformational grammar. Our only guides were Chomsky’s little 1957 book,
Syntactic Structures, along with ongoing lectures at MIT; and we used Nelson
Francis’ (1958) book, The Structure of American English, as a back-up for
structural definitions of linguistic categories. We paid close attention to the
auxiliary system and to word-order patterns, because these had played a central
role in Syntactic Structures. We kept track of sentence types—affirmative, nega-
tive, and questions—in which uses of auxiliaries and word order would vary.
Linguistic growth was assessed in terms of things to be added to childish sen-
tences to make them adult-like: the additions of omitted functionals (inflections,
prepositions, articles, and the like) and transformational operations. We did not
categorize utterances in terms of communicative intent—that is, in terms of
semantics or speech acts or extended discourse skills—and so we did not look for
growth in terms of additions or enrichment of such abilities. Our central concern
was with syntax and morphology, with some later interest in prosody. We
worried about such questions as whether child grammar was finite state or
transformational, and whether syntactic "kernels" were the first sentence forms
to appear in child speech.

By the first month we decided that Adam’s early sentences were not transfor-
mationally derived in the adult sense, because of the absence of the elements be,
have, -ing, will, can, and do. We found that contractions such as can't and don't,
which we thought to be transformations, had to be described in different terms in
the children’s grammars, because the corresponding full forms, such as cannot
and do not, and the affirmative can and do, were not yet present in their speech.
It was already necessary to think of the growth of grammar in the child’s terms,
rather than to read backward from adult grammar. And already, at that point, it
was evident to us that transformational grammar could not help us to describe
the ways in which a child constructs a grammar. I find a marginal note from 1963:
The problem is that of the child's discovery procedure, which Chomsky doesn't discuss much.

his problem, of course, remains with us. What we did have from Chomsky was a definition of linguistic behavior in terms of rules. He has stated this Leitmotiv in many ways through the years. In my notes from a 1963 lecture of his, Inderlined:

Language is rule-governed rather than memory-produced behavior.

and so we looked for evidence for rules in regularities of speech, drawing our categories from transformational grammar. In that first year we found evidence of such syntactic operations as inversions for questions, fronting of question words, use of auxiliaries to carry negation and tense, formation of tag questions, and similar phenomena. What is of interest to me now is that such findings are still important for theories of language acquisition, even though the particular linguistic model that inspired them has been replaced by so many revisions and alternates.

But these findings are well known in the literature. More interesting to me in those old notes are the hints of things to come. And here I would like to discuss first issues of method and then issues of theory. In the introduction to A First Language, Brown says:

In the seminar small experiments or near-experiments were often suggested and tried by the main investigators. The results were sometimes useful but never conclusive; the difficulties of experimentation with small children are considerable, and we put the transcription schedule first (p. 53).

Experimentation, of course, would require larger numbers of children and more careful controls. But what surprised me in reading through the notes was the broad range of techniques that we devised and attempted. We studied imitation, comprehension, production, and judgments of grammaticality. There were elicited imitations of systematically distorted sentences. There were comprehension tests of singular/plural, active/passive, past/present, locative prepositions, and possessives. To study production there were Berko tests with nonsense words. New words were taught in one context, and we tracked their appearance in another context. For example, Adam was taught that he could *pim* a piece of paper—that is, crumple it—and later he spontaneously said *I pimming*, giving us conclusive evidence of the productivity of the progressive at that stage. We devised mini training experiments, in which the child was to change verbs from one form to another. And so forth. It was evident that experimentation and the study of naturalistic data would have to go hand-in-hand in the study of child language.

In terms of theory, it was also evident in our aside that grammatical development was embedded in processes of thought and social interaction, and that general cognitive principles were at play. Since those days—in the late 60s and 70s—a variety of social and cognitive factors have been added to our initial study of grammar. In fact, extralinguistic variables have attracted so much recent attention that the linguistic variables themselves have often been ignored or even redefined out of existence. I can think of seven popular terms that have both enriched and obscured the study of the acquisition of linguistic structure in recent years: *semantics, context, input, pragmatics, discourse, cognition, and strategies*. These terms reflect three intersecting groups of variables that lie outside of linguistic structure per se but must play their roles in the acquisition of that structure. The current problem of our field, as I see it, is to attend to these three sets of issues without losing sight of language itself.

First, theoreticians of semantics and contextual factors emphasize that early messages are supported by situational as well as linguistic information—in both comprehension and production. The observers of Adam, Eve, and Sarah certainly kept contextual notes, but because our interest was focused on syntax and morphology, these notes were used primarily for disambiguation. The "rich interpretation" of Lois Bloom came several years later, but we did wonder, from time to time, what the children were intending to say; and we did test their comprehension of linguistic structures in situations lacking contextual cues, since we were aware of the role of context in supporting comprehension in natural settings.

A second group of modern researchers—pragmatic, discourse—emphasize that much of meaning is carried by the structure and content of social interaction. We attended to mother-child interaction, but not as a problem in its own right. For example, in regard to input, I find the following observation in the third week of our meetings:

We constantly ran against the problem of individual differences in the tutor.

This issue lay dormant until the 70s. In the early 60s we were looking for universals, and individual differences were a nuisance. We were concerned with mother-child interaction, but we saw it as a source of linguistic training. We attended to mothers' expansions of child speech and children's initiations of mothers' speech. Conversation was a source of knowledge, not a skill to be studied in its own right at that time. Yet we did pay attention to sequences of interchanges and the linguistic skills required to ask and respond to questions.

A third group of modern theoreticians attend to cognition and language-processing strategies, arguing that syntax is a reflection of more broadly-based structures and processes. Attempts are made to replace grammar with a set of semantic structures and on-line processing of temporally-patterned sequences.
We were concerned with such factors as asides, though they did not play a central role in the theorizing of the early 60s. For example, in regard to semantics and cognition, I find a remark in Roger’s discussions of the eighth week of Adam’s speech samples:

Is appearance of a form—e.g., past—solely linguistically (structurally, acoustically) determined, or also semantically?

An anticipation, then, of the development of theories later in the decade of “cognitive prerequisites” for the emergence of linguistic forms in child speech.

In regard to language processing, we paid attention to the child’s emerging sense of grammaticality, as evidenced in self-corrections and vocalizations in use of inflections. The group, at one point, discussed whether the sense of norms emerging in grammar had parallels in the development of other social norms, such as etiquette.

But we were not yet ready to explain language in terms of other cognitive systems, or to reduce grammar to processing capacities, or to seek the roots of grammar in nonlinguistic processes of thought or social interaction. These were later developments, which many of us have since approached, but with caution, remembering our lessons about the special nature of syntax among the systems of human cognition. By and large, those of us who came out of Roger’s workshop have remained fascinated with the central puzzle of the child’s discovery and shaping of linguistic structure, while grappling more and more with the major extralinguistic issues which have come to prominence.

In my own case, this fascination soon became embedded in a lifelong fascination with other languages. I find a marginal question in my notes from 1963:

Can anything important about grammatical development be learned by comparing the acquisition of various native tongues?

I have spent the years since then trying to show how this question can be answered in the affirmative. This is not the place to summarize those attempts. (See Aksu-Koç & Slobin, 1985; Ammon & Slobin, 1979; Johnston & Slobin, 1979; Slobin, 1966, 1973, 1977, 1981, 1982, 1985, 1986; Slobin & Bever, 1982; Slobin & Talay, 1984) Rather, I would like to explore a new approach developing at Berkeley and elsewhere—an approach that looks for the ways in which individual children, acquiring different sorts of languages, seem to begin with similar notions about the meanings and functions of grammatical categories. This approach attempts to bring together the insights of the three directions mentioned above—semantic, pragmatic, and cognitive—in accounting for children’s early uses of grammatical morphemes.

THE TOWER OF BABEL

Briefly stated, our approach at Berkeley has been to select matched pairs or sets of languages that vary in the ways in which they express particular semantic or pragmatic notions. The world provides countless “natural experiments,” presenting children with different kinds of problems to solve. Such diversity makes it possible to control variables that are confounded in any given single language.

For example, languages differ in where particular kinds of grammatical markers are placed, and in how much acoustic substance is allotted to various markers. In the Harvard studies we had found that English locative prepositions—words like in, on, and under—were omitted in early child speech. Was this because of the difficulty of encoding locative notions, or the low acoustic salience of prepositions, or a serial position effect in immediate memory disfavoring medial material like prepositions? By comparing languages in which locative notions are encoded in varying positions, it has become evident that both conceptual and perceptual factors are important (Johnston & Slobin, 1979). Such notions are grammatically expressed earlier in languages where they are encoded in more salient positions for perception and short-term memory—that is, when they appear as noun suffixes or as postpositions following nouns. At the same time, across languages, there is a common order of emergence of locative notions, regardless of how they are expressed grammatically. The earliest notions to be encoded—by prefixes or suffixes, prepositions or postpositions—are simple topological notions of proximity, containment, and support—‘in’, ‘on’, ‘under’, ‘next to’. Locative relations embodying notions of perspective, such as ‘back’ and ‘front’, are always later. And so on. That is, conceptual development provides the content for linguistic expression, while linguistic discovery procedures are necessary for working out the mapping of content according to conventions of particular languages.

Our work at Berkeley over the past 15 years or so has been to chart out the course of acquisition of basic notions and their means of expression in a broad spectrum of different types of languages. It is evident that along the way to discovering the full adult system of grammar, the child reveals crosslinguistically standard ways of organizing and simplifying systems of syntax and morphology. Children create grammars in which clearly identifiable surface forms map onto basic semantic categories. Much of the earlier work dealt with children’s use of word-order principles and their construction of morphological paradigms. Most recently, we have begun to see ways in which the emergence of grammatical categories arises from ways in which children view the world and interact with people. As an example of this approach, consider what we are beginning to learn about how children organize the uses of grammatical morphemes before they have fully mastered them according to some adult-like criterion.

The Harvard School contributed a criterion of a child’s mastery of a gram-
natical form: 90% correct usage in obligatory contexts for that form. This was based on notions of formal grammar prevalent in the 60s (and since), according to which one could specify linguistic contexts for grammatical morphemes. Until he child reached a point of near-perfect use of a form in its specified context, it was assumed that fluctuations in use of the form simply reflected incomplete mastery, presumably due to performance factors operating within a theory of incremental learning. Presence or absence of a form was not considered to be motivated in ways that were linguistically or psychologically interesting. More recently, however, it has become evident that the absence of a grammatical form in an "obligatory" context can reveal the child's own definition of the contexts that call for use of the form in question. Crosslinguistically, it appears that children begin with common notions of the semantic–pragmatic categories that are most salient for grammatical expression.

This first became evident to me in examining children's early grammatical marking of agents and objects in ergative and accusative languages (Slobin, 1981). Gvozdev (1949) noted, long ago, a significant restriction in his child's first uses of the Russian accusative inflection on nouns. Rather than inflecting every direct object, his son at first applied the accusative only to nouns that were the objects of verbs of direct, physical manipulation, such as 'give', 'carry', 'put', and 'throw', omitting the accusative for less manipulative verbs such as 'read' and 'see'. The child was thus below the 90% criterion for use of this grammatical morpheme, yet he was clearly using the morpheme consistently. He was orienting to what I have called the "Manipulative Activity Scene" (Slobin, 1985), using the accusative to grammaticize highly transitive events (Hopper & Thompson, 1980). Since Russian is an accusative language, this early grammaticization was recruited to the object noun as the locus for grammatical expression of the Manipulative Activity Scene.

More recently, Schieffelin (1979, 1982) has investigated acquisition of an ergative language, Kaluli, of New Guinea. In such languages, agents of transitive verbs, rather than patients, receive grammatical marking. Schieffelin found that early use of the ergative inflection on nouns in Kaluli was limited to agents in the Manipulative Activity Scene—that is, the inflection appeared only on subjects of verbs such as 'give', 'grab', 'take', and 'hit', and was omitted on subjects of verbs such as 'see', 'say', and 'call'. (It was also not overgeneralized to subjects of intransitive verbs, such as 'run' and 'fall'). Again, 90% mastery was not demonstrated, but children's restrictions of usage were motivated, following the same criterion for restriction as in Russian. Furthermore, the ergative at first appeared only in sentences that were affirmative and in the past tense. Apparently children determine that an event is truly manipulative only if it has actually occurred and has been carried to completion.

The Berkeley School has sought both cognitive and pragmatic reasons for children's definitions of the scope of application of grammatical morphemes below the 90% criterion. In highly inflectional languages, such as Hungarian and Turkish, case inflections can even appear on single words. In an early study of the acquisition of Hungarian—another accusative language—MacWhinney (1973) found that 44% of single nouns occurred in the accusative in the speech of one child. Even before the presence of an obligatory grammatical frame, these nouns expressed a clear pragmatic function. Accusative forms were not used for naming objects but referred specifically to things that the child wanted to have or to build—obviously nouns that would be the objects of highly transitive, manipulative verbs—whereas nouns in the nominative were used for naming. These uses of accusative inflections are involved in particular kinds of speech acts—what Nancy Budwig (1986) has called expressions of "the child's desire to control or claim an object to carry out an action." The Manipulative Activity Scene thus includes both a characterization of a prototypical event type (highly transitive) and the expression of a prototypical action frame (control/claim object). This action frame serves as the locus of organization for other grammatical morphemes as well.

Deutsch and Budwig (1983) re-examined possessive constructions in Brown's original transcripts of Adam and Eve. Brown had noted apparently random use of uninflected names and possessive pronouns to indicate possession (e.g., "Play with Eve broom"); "That my bottle"). The nominal and pronominal possessive forms were used with a fairly equal distribution for a period of several months. However, in terms of a functional analysis, the two forms regularly occurred in different pragmatic contexts. The pronominal forms were used in the "vocational" action frame described above, while the nominal forms were used in "indicative" action frames in which the child simply indicated possession in situations where the fact of possession was not in question. For example, when an adult wanted Adam to give up a toy car that he was playing with, the child asserted control by saying "my car"; whereas when he was noting a comparison between a picture in a book and his own possession, he said, "Just like Adam horsey shirt." Budwig (unpublished dissertation draft) points out that Adam and Eve (as well as some of the children studied by Susan Ervin-Tripp and Wicke Miller at Berkeley) have apparently grammaticized a distinction that is not marked in adult English:

It should be noted that the distinction drawn by the children is also not one that the caregivers used with the children. That is, the children are not picking up on a contrast that they hear as part of their interactions with caregivers who themselves often employ nominal and pronominal forms (cf. Deutsch & Budwig, 1983). The distinction that the children make then seems to be of their own creation, one motivated by the pragmatic perspective that the child takes on such utterances.

Budwig (1986) has gone on to find that nominal and pronominal forms contrast in similar fashion when they are used as subjects. Pronominal subjects occur with verbs expressing desires and intentions, as in the following examples from
the Berkeley data: "I want it Mommy." "I like something else for me." "I need toast after breakfast." Nominal subjects describe objects belonging to an individual, often in a contrastive framework: "Laura has a green car." "Carol has a life belt." Nominal forms also tend to be followed by action verbs: "Carol do it." "Sally read." Budwig characterizes the use of nominal subjects as "instances in which the perspective on the self taken by the child was one of describing, and the self is viewed from a referential perspective." Again, we have something like a more dynamic, affectively loaded use of pronouns, along with a less dynamic, information-giving use of nouns.

If we look back at the one-word stage, we find intriguing hints that English pronouns, and Hungarian nouns in the accusative, are used to express the volitional function. In English, Gopnik (1980) has found frequent early use of my, mine, and mine's when the child wanted to claim an object. This finding is similar to MacWhinney's report of early use of accusative nouns in Hungarian. (The accusative is not productive at this point, but it is important to note that nouns in the accusative form contrast with those in the nominative, in that only the latter are used for naming objects—a precursor of the indicative function.) It is probably a crosslinguistic regularity that children, early on, seek expression of the volitional and indicative functions, drawing upon salient grammatical morphemes offered by the language. Eventually, from such a starting point, children will organize systems of pronouns and case inflections; but, to begin with, all of these various forms seem to express particular, child-oriented speech functions.

Children's use of verb tenses casts further light on the distinction between these two functions. Recall that Kaluli sentences with ergative subject nouns tend to be in the past tense, suggesting that the use of nouns is involved in the descriptive function. The volitional function is future-oriented, and I would expect that volitional utterances in child Kaluli are expressed with ergative subject pronouns and non-past verbs. Budwig presents suggestive supportive evidence from the Berkeley English data. Sentences with nominal subjects and process verbs refer to past or ongoing events, such as "Carol do it"; "Sally read"; and "Laura finish hers too." By contrast, sentences with pronominal subjects have stative verbs of desire or intention in regard to future events, such as "I want something else a bag"; "I want play puzzle"; and "I like something for me." Budwig suggests that this split reflects "a distinction between using language to Describe vs. Plan (in the performative sense) happenings."

A related distinction has been elaborated in depth by Julie Gerhardt (1983) in a Berkeley dissertation on the language of 3- and 4-year-olds. Gerhardt has discovered a clear distinction between the use of will and gonna in the future-oriented utterances of the children she studied. Will is used to carry out acts of what Gerhardt calls Undertaking, while gonna expresses acts of Planning. In Undertaking, the child commits herself to carry out part of an ongoing, cooperative endeavor in the immediate future, whereas Planning is related to more distant future events, such as description of end-states or narrating possible future events. Undertaking is clearly volitional, while Planning is more descriptive. Again, we see children organizing the grammatical means provided by the language to express particular pragmatic functions.

In another Berkeley dissertation, Savasir (1984) has investigated the development of tense, person, and voice morphemes in Turkish. He has found an early grammatical distinction between the expression of intentions and the consequences of intentions. The first passives in 2-year-olds occur in limited contexts: A first-person active is followed by a third-person passive. In a typical example, a child attempts to open a box, announcing her intention in the future tense: 'I'll open the box'. When her attempt fails, she reports this failure in a negated third-person present tense in the passive: 'It isn't being opened'. The passive is, at first, limited to this peculiar conjunction of grammatical morphemes. Savasir (1984) suggests: "It would seem that the earliest occurrences of the passive in the present tense are used to report those instances in which the child's intentions or plans are impaired due to a resistance from an object" (p. 38). The passive thus allows the child to "view the verb as an 'attribute' of its grammatical object" (p. 38), thereby shifting attention from his or her own action to the resisting object. Thus we have a shift from a volitional to a descriptive mode, with an early narrow restriction of the function of the passive in Turkish.

This finding is similar to Antinucci and Miller's (1976) study of Italian child language, also carried out at Berkeley. They found that Italian 2-year-olds, in past-tense utterances, make the past participle agree with the object in number and gender, although such agreement is not part of the adult language. For example, a boy says Ho presa la campana 'I took+FEM.SG the+FEM.SG bell+FEM.SG' rather than Ho presa la campana, with the appropriate neutral form of the participle, preso. The Italian children seem to be attributing the past participle to the object, just as the early Turkish passives allow for attribution of the verb to the object. These verb morphemes, then, seem to adapt the verb to function in a description of the affected object, shifting attention from the active perspective of the volitional mode.

These studies, and others carried out elsewhere, reflect a growing interest in the prototypical semantic and pragmatic functions that seem to underlie the initial organization of grammatical morphemes crosslinguistically. This approach seeks to fill in the picture of development from the first uses of grammatical morphemes to the 90% stage of mastery studied at Harvard. Many pieces, theoretical and empirical, remain to be filled in at every step of the way. We are still working on the same puzzle as Roger Brown's 1962–63 seminar. We have found a few more of the pieces scattered around the globe, and are trying to find additional ways to fit them into the puzzle.

1988 POSTSCRIPT

This essay was completed in 1984. In the several years since then, the tradition that I have called "The Berkeley School" has continued to explore cognitive and pragmatic bases of children's acquisition and use of grammatical constructions, with special attention to discourse.
Julie Gerhardt (Gee) and Iskender Savasir have written a series of papers in which they explore diverse purposes served by a range of forms expressing tense, aspect, and modality in English, Gee-Gerhardt, 1986; Gerhardt, in press; Gee & Savasir, 1985, 1986). The essence of their approach is "to show how a distributional analysis characterizing the use of a particular grammatical construction in the speech of children also counts as the description of a distinct social practice--brought about, for example, through the use of this grammatical construction." Gerhardt & Savasir, 1986, p. 502. They show, for example, how the use of the simple present tense by 3-year-olds is not simply a matter of grammatical tense, but is commonly used to describe normative behavior or to form a sense of action. They propose that a child's use of this construction is "imputing" to others a sense of ongoing activity, whereas when she says, "And you put them like that," she is giving instructions with regard to a norm.

Nancy Budwig (1986), in her recent dissertation, characterizes her approach as part of "a major shift in paradigm" in the following terms: "Rather than starting one's analysis with some a priori notion of what constitutes an obligatory context for the employment of forms, focus is placed on how the subject's word use is observed. The relationship of a word's use to its context is the primary issue." In continuing her work on the grammatical functions of agent and control, she has found that some 2-year-olds encode the non-prototypical Activity Scene by the differential use of the and my as subject pronouns. These children use my in utterances in which the subject is the prototypical agent, with a highly reflexive verb and a direct effect--either to report a completed volitional act, such as "My blew the candles out," or to announce such an act, as in "My take it home." Thus, for example, they tend to co-occur with verbs that are either stative and perfective, or future-intentional. When I is used as subject pronoun, the utterances are active in agentivity, expressing experiential states, such as "I like be," in response to an adult question. Budwig concludes that semantic and pragmatic factors function jointly to determine such non-prototypical uses (1985, p. 342): "The uses of my ... appear in utterances that function as volitional acts; that is, as directives, requests, challenges, protests and disputes over control of objects, events and actions of others. In contrast, utterances ranking low in transitivity involve me use of I involve no such attempt to bring about a change." Thus, we see that particular semantic/pragmatic constellations play a key role in directing the usual uses of grammatical forms. Such constellations include speech act dimensions in combination with markers of grammatical function, person, tense, and aspect-modality.

The interaction of form and function in discourse is also being explored over a wide age range from 3 to adult) in a series of studies initiated by Michael Bamberg's (1985) dissertation on narrative development. As he notes (p. 251): "The underlying implication of such studies is the necessity to understand the form-function relationships is the assumption that there are discourse motivating factors that rule the use of the investigated forms, and that the time used to develop the constitutive form-function relationships remain to be developed. Bamberg has shown that German children's use of both tense-aspect and form-function factors reflect successive stages of narrative organization. This work is continuing in a broad crosslinguistic format, in which children working on the Tower of Babel learn to construct narratives in English, German, Hebrew, Icelandic, Spanish, Turkish, and American Sign Language (Berman & Slobin, 1987).

A quarter-century from Adam and Eve, we are still trying to interpret the Book of Genesis.

REFERENCES


