

Unravelling competence, performance and pragmatics in the speech of young children*

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ABSTRACT

Inferences about linguistic competence in children are typically based on spontaneous speech. This poses a problem since we know that other factors are also involved in speech production. Children who may use complex object and adverbial NPs do not use complex subject NPs. Is this a competence deficit, a performance problem, or simply a reflection of pragmatic factors? Evidence presented here suggests that children probably do not need complex subjects. An extensive use of pronouns in subject but not object position indicates that pragmatics may account for the distribution of clauses in their speech. A similar pattern in adult speech indicates there is no warrant to conclude children's lack of subject clauses reflects anything more than the nature of spontaneous speech.

INTRODUCTION

The spontaneously produced speech of young children is our primary source of information about the course of language development. This contrasts with the kind of information underlying theories of linguistic competence in fluent, mature speakers. One can hardly expect a two-year-old child to produce a specific kind of construction upon request or rely upon the child to make useful judgments regarding the grammaticality of sentences. Consider how different contemporary grammatical analyses might be if their objective were only to characterize the spontaneously produced utterances of fluent speakers instead of the unique examples contrived by linguists to illustrate the creative potential of the language.

There are a number of difficulties in using production data alone to infer the extent of linguistic knowledge in a child. We know that speech is a joint function of linguistic competence, various performance factors, and pragmatics of communication. Such things as linguistic rules, respiratory demands, memory limitations, topic and locus of conversation, and communicative intent all together determine the final product. How then can we decide, when a certain construction is NOT observed, whether to assume the child has not yet acquired that construction or simply that the child for some reason has not used it? Since we presume that at some point young children do not know all their language, it is easy -- perhaps too easy -- to conclude that a construction or form not observed has not yet been learned by the child.

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Just this problem arose in a previous investigation (Limber 1973) of complex sentences in children between the ages of 2;0 and 3;0. Leopold (1949: 37) reported in his classic study of language development that his daughter had mastered the complex sentences of English before 3;0, and that with few exceptions there was little difference between his daughter's language and that of a mature speaker. This claim was substantiated in Limber (1973) for three monolingual children of the same age as Leopold's daughter. With some important exceptions, all basic syntactic forms including complex sentences were observed in the spontaneous speech of these children. Certain of the exceptions appear to be attributable to the lack of the appropriate semantic or conceptual notions underlying the syntactic or lexical forms. For example, since time notions are poorly developed in children at this age, it is not surprising to find that syntactic constructions pre-supposing an underlying conception of time are not used appropriately by these children.

However, one gap in the speech of these children seemed not readily attributable to any underlying semantic deficit. This was the failure to observe any instances of a complex sentence in which syntactic operations involved the subject noun phrase (NP) of either the matrix or constituent clause. This contrasts with many instances of the comparable syntactic structures involving object NPs. While there were many instances of object complementation, there was no instance of subject complementation. While there were a few instances of object relatives on object NPs and relatives involving adverbial nouns, e.g. *I remember the place we went* or *the way Mommy cooks it*, there was only one instance in a year of systematic recording of anything resembling a relative clause involving a subject NP. This was a subject relative on the subject NP within an object NP complement clauses: *I think that the girl ... that's here ... doesn't ... she doesn't want me to open it.*

Since the complement and relative constructions deal with the same semantic notions whether in subject or object position, it is unlikely that any semantic or conceptual deficits of children at the age can be responsible for the lack of syntactic structures involving subject NPs. Three alternative possibilities were briefly considered in Limber (1973) by way of explaining these findings: competence deficits, performance factors involving embedding, and pragmatic aspects of children's communication. The present paper reconsiders these alternatives and presents new data consonant with the idea that pragmatic aspects of children's communication alone may explain the sparse use of syntactic structures involving subject NPs.

Competence deficits

As children presumably do learn their language, one expects their linguistic knowledge to be in a state of flux over time. At some point children just might not know that certain syntactic operations utilized on object NPs can be used with subject NPs. Perhaps the grammar of these children simply does not as yet permit operations on subject NPs and this is reflected directly in the production data. As I have suggested elsewhere (Limber 1970), short term acoustic memory may impose a universal heuristic learning strategy upon children initially forcing them to attend to the latter portions of an utterance. A consequence of this could be that inductions about syntactic and phonological rules of a language are first made in the object portions of utterances and then generalized elsewhere when appropriate. Although I know of no direct way to investigate this issue, it is a matter of some importance to consider the level of description at which the child operates when learning about embedding processes and other syntactic features in its language. If the child is operating with syntactic categories like noun phrase and verb phrase as in Chomsky (1965), one might expect that an induction about the syntactic reflexes of a category, say NP, would soon be valid for all instances of NP regardless of the grammatical or semantic relationship expressed by that category. On the other hand, if the child is operating with semantic categories such as agent and object, one would expect the child to take relatively longer to learn that its generalizations made about object constructions are also valid for subject constructions.

The evidence is, of course, reasonably consistent with this latter possibility: syntactic innovations generally appear in spontaneous speech in object NP position before they appear in subject NP position. Unless a plausible alternative explanation for this empirical generalization can be found, it could be argued that syntactic categories are somehow derived from more primitive semantic or conceptual categories, as the Piagetians (Sinclair-de Zwart 1973) and others have suggested in contrast to Chomsky's (1965) hypotheses regarding the innate nature of grammatical categories. As we have nothing beyond speculation on these matters at present, it is extremely useful to formally explicate the alternatives and to begin developing evidence to evaluate them.

Performance factors

One obvious consequence of not using sentences with syntactic operations on subject NPs is that nested sentences are thus precluded. No clauses are interrupted by another clause, then resumed. It is a traditional belief that such nestings are somehow more difficult to produce and perceive. Barron (1940; 75), for example, reiterates the assertion found in many early studies of language development that interrupting a main clause while producing a subordinate clause requires considerably more planning than producing a sentence by a 'simple process of accretion as it was spoken.' Recent research has implicated centre embedding as a source of complexity in a variety of language tasks (Fodor, Bever & Garrett 1974). Although there seems to be no direct evidence regarding the complexity of producing nested sentences, it is certainly possible that perceptual difficulties for the listener are somehow translated into learning difficulties for the child.

It is more than likely that there are several performance factors involved. Nesting alone would not account for the lack of sentences in which the subject NP of a relative clause was attached to the object NP of the matrix sentence, e.g. *I saw the boy who helped me*. Sheldon (1974) reviews some of the major issues and the evidence bearing on the matter. She argues that nesting itself is insufficient to account for the patterns of results found in a comprehension task and proposes a 'parallel function hypothesis' to account for those results: if co-referential NPs in a complex sentence have the same grammatical function, that sentence will be easier, other things being equal, than a sentence in which the co-referential NPs have different grammatical functions.

Despite some intuitive plausibility (cf. Yngve 1960), it is much too early to adequately assess the role of performance factors in limiting the child's production of specific syntactic constructions. Nesting may be a factor but it is not the only one. Furthermore, most of our knowledge dealing with so-called performance factors comes from comprehension studies which, as I discuss below, may tell us very little specifically about production.

Pragmatic considerations

There is an alternative to either competence- or performance-oriented explanations of the distribution of clauses in children's speech. Perhaps, as was suggested in Limber (1973), these observations reflect what children talk about -- pragmatic factors -- rather than any deficit in linguistic knowledge or any underdeveloped information-processing capacity. Pragmatic considerations involve those factors beyond formal syntactic and semantic structures that control the use of linguistic expressions in communication. Of particular interest here are those factors governing selection of referring expressions including the nature and location of the referent, its perceptual salience, prior communications, and the referential adequacy of the expression from the perspective of the audience. These children, considering what they talk about and the communication situation as they see it, may just not require all the referential power available to them through the linguistic processes of relativization or complementation. Psychologically, why should we expect anyone to use complex noun phrases when pronouns, names or demonstratives will do? Linguistically, an extensive use of names, pronouns or demonstratives in a given environment very much reduces the possibilities for observing a relative or complement clause in that environment.

We must therefore consider that the observed patterning of subject NPs is not related to competence or performance factors at all, but instead is simply a consequence of the extensive use by children of names and pronouns in the subject NP position. A symmetrical distribution of NP types between subject and object position in simple sentences would discredit the importance of such pragmatic factors in accounting for the observed asymmetries in complex sentences. On the other hand, a non-symmetrical distribution of NP types with a high proportion of names and pronouns in subject NP position and a comparatively lower proportion of names and pronouns in subject NP position and a comparatively lower proportion of those non-expandable NPs in object position would be compatible with the idea that pragmatic factors, independently of competence and performance factors, determine the distribution of clauses in children's speech.

A preliminary test of this hypothesis, based on the records of one child, was reported in Limber (1973). An obvious non-symmetrical distribution in accord with the pragmatic account was found. What follows is an extensive analysis of NP types in children's speech, based on many more children in a number of situations.

METHOD

A number of transcriptions of children's speech acquired as described in Limber (1973) were selected. All children were between the ages of 2;0 and 4;0. In addition several other transcriptions, as described below, were obtained in order to permit comparison of the distribution of NP types across situations and ages.

Selection of sentences. Only the spontaneous simple sentences in the transcripts were included in the analysis. Sentences with two or more verbs (with the exception of tags, e.g. *will you*) were excluded from the analysis and will not be considered here. About 90% of all sentences in the children's transcriptions were defined as simple by this criterion. The great majority of complex sentences were conjunctions, adverbial clauses and object complements.

Classification of NP types. Initially the following categories were used: animate nouns, inanimate nouns, personal pronouns, impersonal pronouns, proper names, animals and others that might be considered animate by children. Only four of these categories were retained: animate nouns, inanimate nouns, personal pronouns and impersonal pronouns. The 'animal' category proved insignificant, while the 'proper name' category was collapsed into the animate noun category. Names constituted less than 2% of all NPs; many of these were found in such examples as *Mommy, you looka this*. Collapsing these categories is essentially a conservative strategy that tends to inflate the frequencies of the animate noun category and increase the number of potentially expandable NPs.

The transcripts. The transcriptions of spontaneous speech came from several sources. Of primary interest are the first two; the others were analysed for comparison purposes.

(1) *Children.* These sentences were collected from the records of 8 children from the study described in Limber (1973). The recording situation involved one child between 2;0 and 4;0, along with an experimenter and parent. Recording sessions were all in the same room and lasted approximately 30 minutes. There was no systematic basis for including a particular session other than availability of a transcript of that session.

(2) *Nursery school.* These sentences were recorded at a nursery school for children between 2;0 and 4;0. Recordings were made over a period of several days. No adults interacted verbally with these children during recording. Three to five children were playing together during the recording.

(3) *College females.* These sentences were collected by recording conversations among several college-age females spending a few days at a ski lodge. Recordings were made during and around dinner time.

(4) *Young married couple.* These sentences were taken from the transcripts published in Soskin & John (1963).

(5) *Interview.* These sentences were taken from an interview of a family in Laing & Esterson

(1964: 187-90).

(6) *Play*. These sentences are the dialogue from the play *Happy journey* by Thornton Wilder.

(7) *Pooh*. These sentences are the dialogue in Milne's *Pooh goes visiting*.

RESULTS

Each sentence was examined and its subject and object NP type tallied. For ease of comparison, the NP-type frequencies have been converted to percentages. The original frequencies can, of course, be recovered. The basic data are displayed in Table 1. For the most part these results speak for themselves and require no additional statistical treatment.

The differences between the distribution of NP types in subject and object position are obvious. They are primarily due to the shifts in percentages in the personal pronoun and inanimate noun columns. Furthermore these shifts are in the expected direction, consonant with the pragmatic account of clause distribution. In subject NP position there are a large percentage of personal pronouns and few inanimate NPs, whereas the opposite is true in the object NP position. In that position, there is a striking decrease in personal pronouns and a corresponding increase in inanimate nouns.

As for reliability, the distribution of NP types from all sources turned out to be unexpectedly homogeneous. Despite quite different recording circumstances and activity, the 'children' source and the 'nursery' source give very similar results. Similarly, the 8 children's transcripts combined in the 'children' source show remarkably little variability.

DISCUSSION

The basic outcome of this enquiry is that over all sources, only 13% of all subject NPs are potentially expandable into clauses (i.e. not pronouns) as compared to 65% of the object NPs. The transcripts of the young children ('children' and 'nursery' sources) show virtually the same results, 15.4% and 63.2% respectively. These data unquestionably support the pragmatic hypothesis that subject NPs in spontaneous conversational speech typically do not require the full referential power available in a language. Object NPs, on the other hand, are more diverse, much less predictable, and convey much more information. The linguistic encoding of object NPs therefore is necessarily more complex in order to individuate the greater range of concepts involved.

Reference is achieved in a diversity of ways within a language, from the implicit subject NP in an English imperative sentence to the complex nominalization system used to individuate such things as beliefs, thoughts and propositions in every language (Lees 1960). In between these there is a variety of increasingly structured or encoded NP forms involving various prosodic, phonetic, syntactic and deictic elements. Chafe's (1972) notion of foregrounding is useful in this connection. A foregrounded concept is one that the speaker assumes to be in the hearer's consciousness. Such concepts presumably require less encoding for successful reference; for example reduced stress, use of pronouns and demonstratives. Non-foregrounded concepts, in contrast, are likely to be given relatively greater structure or encoding; for example, prominent stress, greater articulatory accuracy, more precise pointing, and increased use of qualifiers, relative clauses and complement clauses. Subject NPs of course are typically highly foregrounded as reflected in a high usage of pronouns and demonstratives, whereas object NPs are less foregrounded and require greater linguistic encoding to make the intended reference.

On the use of spontaneous speech

There are two methodological morals to be drawn from this investigation. The first is that spontaneous speech of children provides at best a minimum estimate of their linguistic competence. How much of an underestimate obviously depends on how extensive a sample of speech one has at present. I have very little idea of how large a sample is adequate. For example, I recorded the speech of the girl who produced the subject relative in an object NP complement mentioned above for 30 minutes a month for several

years and got exactly that one instance of a subject relative. Because of such problems, such investigators believe that comprehension studies are to be preferred. Sheldon (1974; 274) for example claims that the crucial evidence for any claim about children's linguistic competence must come from facts about how children understand sentences. While comprehension studies can contribute important and complementary information to our knowledge of acquisition processes, they too suffer from certain characteristic problems. For the cooperative children, they tend to OVERESTIMATE linguistic competence because of the availability of various non-linguistic interpretative strategies.¹ For the uncooperative children of course comprehension studies are of little value. The difficulty is in knowing when a child is being cooperative or not independently of its response. There clearly is need for new methods of studying language development. One technique which may prove useful in dealing with these problems is a variant of the familiar CLOZE technique. This combines features of spontaneous speech production with comprehension in that the child is asked to reconstruct unintelligible portions of a recording. Exploratory use of this technique indicates that four-year-olds will produce plausible completions for nested clauses, clauses that would not appear in many hours of spontaneous speech, if at all.

The second moral is that any analysis of the spontaneous speech of children should be compared with a control sample of spontaneous speech taken from fluent speakers in a relatively comparable situation. A sound practice in any area of developmental psychology, this offers some protection against the double standard of attributing gaps in children's performance to some developmental deficit but tacitly assuming alternative explanations when those same gaps occur in the speech of a presumed fluent, mature individual. The most difficult problem in applying this moral is deciding what counts as a comparable speech situation for children and adults. I believe, however, that almost any comparison is better than none at all; despite intrinsic differences in what children and adults talk about and the kinds of conversational situations in which they both typically participate. In my data, for example, the 'nursery' transcripts and the 'female' transcripts are similar in that four or five similar individuals were recorded talking amongst themselves in a natural situation. In Table 1 the same trends concerning expandable NPs are obvious. The transcripts are different in that the children are talking much more about current activities, drawing faces and watching animals in an aquarium, than about each other or their friends. This is reflected in Table 1 by differences in animate nouns and pronouns in objective NP position. There is also a substantial difference in the proportion of complex sentences used. About 10% of the children's sentences are complex whereas 36% of the 'female' sentences are complex. Despite this difference in proportion of complex sentences, in terms of types of construction used there is very little difference. The primary difference in proportion of complex sentences in the 'female' transcript is due to many long narrative conjoined statements, e.g. *I couldn't bring a sleeping bag and I asked Ann if she wanted me to and she said no there are a couple up there and you brought yours, the two of you.* The children, as usual, use conjunctions, adverbial clauses and object relatives. Some examples from that transcript are as follows:

There is the place where you put all those things.
 Those are things which you put stoppers.
 I'm going to put how many eyes I want to.
 I love it when it's cooked.

¹ Such non-linguistic interpretative strategies enable children on occasion to assign a meaning to an utterance with little knowledge of the formal structure of the language. I would imagine this is the only way that in fact they can learn their language. given such utterance-meaning pairs, it is up to the child to find the function relating the two. It is in this sense that comprehension precedes production.

The single most interesting thing about those two transcripts, totalling over 1,000 sentences, is that there is only one instance of a clause attached to a subject NP. This is in the 'female' transcript, *Well these buses that I've had today have been really weird.*

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TABLE 1. *Analysis of NP types for subject and object NP position*

Source	Position	NP types (% of total frequency)				
		Total Frequency	Animate noun	Inanimate noun	Impersonal pronoun	Personal pronoun

Children	Subject	846	11	5	17	65
	Object	654	9	54	29	5
Nursery	Subject	435	11	3	20	65
	Object	386	18	45	26	3
Females	Subject	262	4	2	23	71
	Object	141	1	48	31	16
Couple	Subject	79	9	4	19	68
	Object	36	8	45	33	14
Interview	Subject	59	5	0	0	95
	Object	31	7	35	23	35
Play	Subject	194	10	3	28	59
	Object	139	9	52	25	11
Pooh	Subject	13	0	0	35	65
	Object	7	8	23	23	46

