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Syntax and Vocabulary of Mothers' Speech to Young Children: Age and Sex Comparisons

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PHILLIPS, JULIET R. *Syntax and Vocabulary of Mothers' Speech to Young Children: Age and Sex Comparisons*. *CHILD DEVELOPMENT*, 1973, 44, 182-185. This study compared speech addressed to children with speech addressed to an adult; 10 measures of syntax and vocabulary were used. In addition, comparisons were made of speech addressed to children of different ages (8, 18, and 28 months) and sexes. Significant differences between speech addressed to children and speech addressed to an adult were found in all measures. In 7 measures, significant differences were found between speech addressed to 18-month children and speech addressed to 28-month children. In general these findings obtain equally for separate samples of boys and girls.

A recent article presented data supporting the hypothesis that "mothers' speech to young children was simpler and more redundant than their normal speech" (Snow 1972). In an independent study the present author found evidence supporting the same hypothesis. A short outline of this study will be given here; results which duplicate Snow's findings will be treated briefly, while those which supplement her findings will be described in greater detail.

The designs of the two studies diverge in several important ways. Although the major hypotheses were the same, the minor hypotheses differed. Snow examined the effect of task structure, the experience of the speaker with children of different ages, and the absence or presence of the child addressed; the present study investigated the effect of the child's age on the speech of the speaker. However, these different secondary hypotheses were motivated by a common concern; both investigators are searching for mechanisms controlling observed differences in styles of speech addressed to children.

The studies differed with respect to age of addressee; Snow used 2-year-old and 10-year-old children, while the present study compared speech addressed to 8-month, 18-month, and 28-month children and to an adult. In addition, Snow concentrated on measures of syntax alone, while the present study included measures of

vocabulary as well. The data in both studies were collected in a laboratory setting, but Snow's data were gathered in a structured task situation, while the present study used a set of toys to elicit naturalistic play. Finally, the present study had comparable samples of boys and girls; effects of sex could therefore be examined.

The present study examined the primary hypothesis that adults do not speak to children as they speak to other adults; instead they use much simpler syntax and restricted vocabulary. A second hypothesis states that the speech addressed to a child becomes more adult-like as the child increases in linguistic competence. These two general hypotheses were tested in the form of 10 specific hypotheses related to 10 measures of syntax and vocabulary.

Method

Subjects

The subjects consisted of 30 mother-child pairs. The mothers were wives of house staff of the Johns Hopkins Hospital in Baltimore. The children were firstborn boys; 10 of them were 8 months old, 10 were 18 months old, and 10 were 28 months old.

Procedure

Data collection.—The mothers' speech was recorded inside a sound-shielded room which

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contained toys and children's furniture. During the first half of the recording session, the mother and child engaged in free play for 15 minutes. The free-play situation will be called Condition B, and the mothers' speech produced during this time will be referred to as B-speech (i.e., baby speech). During the second half of the session the experimenter entered the room and engaged the mother in casual conversation for 15 minutes. This situation will be called Condition A, and the speech produced by the mother during this condition will be referred to as A-speech (i.e., adult speech).

Scoring of materials.—The taped speech was transcribed from the beginning of each condition until 75 utterances or 300 words were obtained, whichever took longer. Then each word was coded into one of 10 grammatical categories: noun, adjective, article, verb, auxiliary, adverb, preposition, conjunction, pronoun, and exclamatory word. These categories formed the basis for most of the measures by which the hypotheses were tested.

Measures.—Six of the 10 measures used to test the general hypotheses reflected syntactic complexity: number of words per utterance, number of verbs per utterance, number of modifiers per utterance, proportion of function words, proportion of content words, and number of verb forms. Since these measures are very similar in purpose and structure to those used by Snow, no further description of them will be given here. (For further details see Phillips 1970.)

The other four measures were designed to reveal the limited set of vocabulary in B-speech. Two of these measures, proportion of Old English verbs and proportion of weak verbs, yielded differences of small magnitude and will therefore not be described. The remaining two yielded more important results; they are described below.

The type-token ratio reflects breadth of vocabulary. It is obtained by dividing the number of words in a sample that are spelled differently by the total number of words in the sample. Thus a large type-token ratio indicates a diverse vocabulary, while a small ratio indicates a restricted, or repetitious, vocabulary. Because the words were already coded into grammatical categories, these codings were included in the type-token count. Thus at least some part of the semantic content of the word was taken into account. The type-token ratio was based on the first 300 words in each

sample. It was hypothesized that the type-token ratio is greater in A-speech than in B-speech.

Concreteness ratings were determined for the first 30 nouns in each transcription in a manner modeled on Paivio, Yuille, and Madigan (1968). This measure was used on the material from the 28-month group only, because of the effort required to determine concreteness ratings. Concreteness ratings are of interest because they reflect the tendency of mothers to choose words from a distinct subset of adult vocabulary when addressing a young child. It was hypothesized that nouns in B-speech would be rated as more concrete than nouns in A-speech.

Data were also collected on the intonation patterns of mothers' speech; these data will be discussed in a separate report.

Results

The general hypothesis stated by Snow was confirmed by the present data: the expected differences between A-speech and B-speech were found in each of the 10 measures, and in each case the difference was significant at the .01 level or better. (For statistical treatment see Phillips 1970.) As can be seen in table 1, the differences between A-speech and B-speech were in most cases substantial as well as significant.

The hypothesis concerning trends on age was tested in two separate comparisons: 8-month B-speech versus 18-month B-speech and 18-month B-speech versus 28-month B-speech. The expected difference between 18-month B-speech and 8-month B-speech was not found; the expected difference between 18-month B-speech and 28-month B-speech was found in five of the nine measures which were carried out on all age groups: number of words per utterance, number of verbs per utterance, number of modifiers per utterance, number of verb forms, and type-token ratio. All of these differences were significant at the .025 level or better. Therefore our second hypothesis is partly supported: there is a change in some aspects of syntax and vocabulary over age of child, beginning at 18 months or perhaps earlier, such that the mother speaks in a more adult fashion as the child grows older.

Although no significant differences were found between 8-month and 18-month B-speech, observation during data collection left the strong impression that a mother's speech

TABLE 1
MEANS OF ALL MEASURES BY AGE GROUP AND
ADDRESSEE, BOYS' DATA ONLY

MEASURE	AGE GROUP	ADDRESSEE	
		Child	Adult
Number of words per utterance	28	4.01	8.47
	18	3.47	8.37
	8	3.56	8.45
Number of verbs per utterance	28	0.92	1.53
	18	0.80	1.57
	8	0.82	1.50
Number of modifiers per utterance	28	0.83	2.60
	18	0.60	2.56
	8	0.73	2.65
Proportion of function words	28	0.19	0.26
	18	0.18	0.25
	8	0.19	0.28
Proportion of content words	28	0.36	0.32
	18	0.37	0.32
	8	0.35	0.31
Number of verb forms in 40 verbs	28	8.5	9.5
	18	6.9	9.3
	8	7.2	9.8
Type-token ratio	28	0.41	0.52
	18	0.34	0.52
	8	0.31	0.51
Concreteness ratings ...	28	6.00	5.27
Number of weak verbs in 40 verbs	28	11.7	12.9
	18	9.4	13.5
	8	11.3	14.7
Number of Old English verbs in 40 words ...	28	38.1	35.7
	18	37.6	35.2
	8	38.3	36.2

to her 8-month child is qualitatively different from other B-speech observed. The mother talked when playing with the child, but she appeared to be talking to and for herself, in spite of the childish intonation patterns and onomatopoeic sequences she often used. The child, in turn, responded very little to what his mother was saying, in contrast to the older children, for whom the content of the mother's speech was important in structuring play. Also, the mothers of 8-month children displayed unusually large differences in style of speech, resulting in high variability of measures of 8-month B-speech. Statistical comparisons of variances of B-speech groups, while not conclusive, suggest strongly that 8-month B-speech

is more variable than either 18-month or 28-month B-speech. These comparisons also reveal that B-speech is least variable at 18 months, the age at which children begin to use syntax.

Replication

The study described above was replicated with a subject group identical to the first sample except that the children were girls and the 28-month group had seven instead of 10 subject pairs. All measures were carried out as before except for the concreteness measure, which will be completed at a later date.

The first striking result of this replication is that, for all 10 measures, the speech of the girls' mothers is almost identical in average value to the speech of the mothers of boys of comparable age. This observation increases our confidence in the reliability of our procedures. At the same time, it raises questions about the failure to find the sex differences which have often been discovered in other aspects of language development (e.g., McCarthy 1930). If sex differences do exist in our data, they must be relatively small compared with the age differences observed. Our procedures reveal differences in speech addressed to young children whose ages differ by 10 months; they will not necessarily reveal differences of much smaller magnitude.

The overall pattern of age differences is similar to that found for the boys' mothers, with certain minor variations. A significant difference in number of verbs per utterance was found between 18-month and 28-month boys; this difference was not significant in the girls' data. On the other hand, significant differences ($p < .025$) were found between the 18-month and 28-month girls' groups in the proportion of function words and the number of Old English verbs, while no such differences were found in the boys' data. Otherwise the findings were identical; especially interesting is the repeated failure to find any differences between the 8-month group and the 18-month group.

Examination of variances revealed no significant differences among the B-speech groups, in contrast to the boys' data. This failure to replicate casts doubt on the validity of the previous finding. However, informal examination of the data suggests that the girls' mothers tended in general to have more diverse speech styles than the boys' mothers; this higher overall variability might have masked real differences in variance between the age groups.

Discussion

We have found significant differences between speech addressed to children and speech addressed to an adult in a laboratory setting. Results supporting Snow's conclusions showed that speech addressed to children is syntactically less complex. Further results, which have no counterpart in Snow's data, showed that vocabulary in speech addressed to children is less varied and more concrete. Most of these speech characteristics change monotonically with the age of the persons addressed, beginning at some point between 8 and 18 months. It is not known at what age of addressee speech reaches its adult level; informal examination of Snow's data on speech to 10-year-old children suggests that it is comparable in syntactic complexity to speech addressed to adults.

We have shown in general that the mother adjusts her speech complexity to the developmental level of the child. However, it seems that mothers do not speak more simply to children of 8 months than to children of 18 months. The trend of complexity of mother's speech on age of child seems to have a point of origin, or a floor, at some time around the first birthday. It is possible that we observe such a floor because the adjustment of B-speech depends on aspects of communication between child and mother which are not present at 8 months. For instance, one would expect such a floor if the mother depended on verbal feedback from

the child in adjusting the level of her speech; since the 8-month child does not produce words, the mother would have nothing to guide her. This conjecture about the mechanism underlying B-speech is supported by Snow's observations on the importance of the child's presence in eliciting low-complexity speech. It seems likely that the verbal input into the child's "Language Acquisition Device" (McNeill 1968) is strongly controlled by the verbal interaction of mother and child.

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