

Mothers' Speech to Children of Four Different Ages

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This study reports analyses, in terms of five different measures, of the speech on two standard tasks of 32 middle-class mothers to their children aged 1½, 2½, 4, and 6 years. Sex and birth order of child were not found to be related to mothers' speech. On four of the measures, both task and age of child had strongly significant effects. In general, with increasing age of child, mothers spoke more, in longer and grammatically more complex utterances, with greater diversity of vocabulary. The differences in speech addressed to 1½-year-olds and that addressed to 2½-year-olds were particularly marked.

INTRODUCTION

Increasingly, writers adopting a social approach to the study of language have been insisting that adults possess, and children must develop, not just a narrow "linguistic competence" for handling isolated sentences divorced from context, but a much broader "communicative competence" involving subtle social and role-taking skills. If that is so, then an obvious type of situation in which adults will use these skills is when talking to children. To the authors, it seems inconceivable that normally socialized mothers could talk to their 2-year-old children in the way they would talk to their husbands.

Several reports involving naturalistic observations have claimed that the speech of adults to children is in fact different from that of adults talking to

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adults (e.g., Brown and Bellugi, 1964; Drach *et al.*, 1969). These studies have been virtually case studies of very limited numbers of children. Very similar claims, however, have emerged from experimental studies involving less rich data but many more children. Granowsky and Krossner (1970) compared kindergarten teachers talking among themselves with the same teachers talking to their 5- and 6-year-old pupils and found that, when talking to the children, teachers used shorter utterances, more "simple" utterances, fewer compound, complex, and elaborated ones, lower type-token ratios, and more words from the 1000 words with the highest frequency in Thorndike-Lorge lists. It should be noted, however, that the situations and topics appear to have differed for the adult-adult and adult-child speech.

Snow (1972) reported somewhat finer age comparisons on more standardized tasks in the speech of mothers to 2- and 10-year-olds. Using three structured tasks and a number of language measures, Snow found that the 2-year-olds were talked to in shorter and grammatically simpler utterances than were the 10-year-olds. In a short conference paper, Broen (1971) reported findings from a study comparing mothers' speech to their own children aged about 2 and 5 years and to another adult. As well as finding vocabulary and syntactic differences, Broen reported that mothers talked to 2-year-olds more slowly, with more pauses at the ends of utterances, and with fewer disfluencies than when talking with adults, with speech to 5-year-olds coming somewhere between the other two. A number of the differences in speech to 2-year-olds and to 5-year-olds were statistically significant.

In the light of the above studies, an obvious next step was to explore in more detail variations in speech to preschool children of different ages. **Would the differences in speech to 2-year-olds and to 5-year-olds reported by Broen prove to be the result of continuing variations throughout that age span or would they prove to be produced by marked variation over a limited period of time?** The present study was designed to help answer these questions.

METHOD

Subjects

The subjects consisted of 32 mother-child pairs, made up of four groups of eight, the groups being defined by age of child. The 1½-year-old group was the youngest which it was practicable to test in the standard tasks to be used. The oldest group consisted of 6-year-olds, who had been attending primary school for an average of about 1 year and whose speech, we assumed, would

be well developed. The two intermediate groups consisted of 2½- and 4-year-olds. All children were within 3 months of the ages described, and the mean ages of the four groups were, in years and months, 1-6, 2-6, 4-1, and 6-0, respectively. Each group was balanced for sex of child and for firstborn and later-born (second or third) children.

The mother-child pairs were recruited through private nursery schools and play groups in middle-class areas. The sample could be described as being from a mixture of middle-middle and upper-middle class families. The occupations of all the fathers fell in the U.K. Registrar-General's classes I and II. Many of the families could be described as professional and probably educationally conscious.

Situation and Tasks

The mother-child pairs were tape-recorded by the second author in a medium-sized room in the Psychology Department with books and toys scattered about. Initially the children were encouraged to play with the books and toys. The mothers were put at ease and then were told that we were interested in mother-child interaction, and in this specific study we were particularly interested in the speech of mothers and the reactions of their children. Thus the mothers were aware that their own speech was of interest to the investigators.

The first task presented to all pairs was a model-building one, the "village" task. The mother, but not the child, could see a constructed model village of houses, shops, trees, etc., built from commercially produced small bricks. A comparable set of bricks was scattered on a table and the mother was asked to help her child build a copy of the village, or part of the village. After 5 min, the mother was told she could stop or continue as she wished.

The second task was the "story" task. A pile of large cards was placed on the table. Each card contained a set of colored pictures, minus the printed text, from a 1-page story in a children's comic, "Disneyland." Each mother was asked to use the sets of pictures as frameworks for telling stories to her child. One or more cards could be used. Thus mothers could, and did, tell different numbers of stories, but always in the same sequence. After 5 min, the mother was told she could stop or continue as she wished.

During both tasks, the investigator sat well away from the pair and made notes on the child's behavior.

Finally, a brief interview was conducted with the mother, questions and queries were discussed, and the study was explained.

Transcribing and Scoring

The first 5 min recording on each task from each pair was initially transcribed by an interested and instructed secretary. This rough transcription was then carefully checked against the tape and corrected where necessary by the second author. Segmentation into "sentence-like" utterances was done on the basis of a mixture of intonational and grammatical cues. In the majority of cases, an utterance was one independent clause and any elements dependent on it, but because of its conversational nature the material also contained a number of utterances without a finite verb. Scoring of the measures to be presented was done by the authors, one author scoring all transcripts for a given measure. Since these measures were largely "mechanical," reliability of scoring was not considered to be a problem.

Measures

The five measures which were calculated relate to a number of aspects of the mothers' speech, and are similar, though not always identical in detail, to measures used by investigators referred to above. Inspection of the transcripts suggested that calculations in terms of words and morphemes would produce roughly comparable outcomes; words were chosen for simplicity. The same five measures were calculated separately for the two tasks.

The total number of words provided a quantitative index of the sheer amount of speech and, since the time was constant for all mothers, a virtual measure of speech rate. The mean utterance length in words provided a measure of the length of what the investigators took to be the basic unit of communication directed to the child. The number of words in disfluencies was a count of the words which occurred in "false starts" to utterances, in interrupted, uncompleted utterances, and in ungrammatical repetitions within utterances. This measure was corrected for differences in total number of words produced by different mothers.

The grammatical complexity per utterance score, like a number of other such measures, was basically dependent on the number of clauses per utterance. In essence, each clause other than the main clause was given a score of either 2 or 1 depending on whether it had a verb in finite or in nonfinite form. This principle was supplemented by a number of more specific rules relating to special cases. Only utterances with at least one finite verb were included in the scoring of grammatical complexity.

The number of different words in a sample of 200 words was included as a variant on the familiar measure of diversity of vocabulary, the type-token

ratio. For the village task, the first 100 words were not scored; the number of different words in the next 200 words was counted. For the story task, the number of different words was counted in the 200 words prior to the end of the first story, about a cowboy and a runaway train. Thus although different mothers told different numbers of stories, the present score was always calculated on the same single story.

To summarize, the five measures covered were amount (and rate) of speech, length of units, disfluencies, syntactic complexity, and richness of vocabulary.

RESULTS

On each of the five measures, a four-way ANOVA was carried out, with age, sex, and birth order as nonrepeated measures and task as a repeated measure. On none of the measures was either sex or birth order significant as a main effect. Since the very few weakly significant interactions involving one or the other would have been expected by chance, given the number of interactions calculated, it can be concluded that neither sex nor order of birth of child had any systematic relation to mothers' speech.

Both task and age of child consistently did have effects. Table I presents for all five measures the mean scores by task and age of child as well as all

Table I. Mean Scores and Significant Effects by Task and Age of Child

| Measure | Task | Age of child (in years) | | | | Significant effects |
|--|---------|-------------------------|------|------|------|---------------------|
| | | 1½ | 2½ | 4 | 6 | |
| 1. Total No. words | Village | 407 | 499 | 621 | 572 | Age 0.01 |
| | Story | 539 | 630 | 784 | 729 | Task 0.001 |
| 2. Mean utterance length (in words) | V | 5.0 | 6.4 | 7.0 | 7.5 | Age 0.001 |
| | S | 5.5 | 9.0 | 9.0 | 8.8 | Task 0.001 |
| 3. Words in disfluencies (per 1000 words) | V | 22.8 | 26.7 | 44.2 | 45.3 | A × T 0.05 |
| | S | 11.2 | 18.3 | 26.3 | 57.4 | |
| 4. Grammatical complexity (per utterance) score | V | 0.20 | 0.54 | 0.56 | 0.65 | Age 0.001 |
| | S | 0.27 | 1.03 | 1.10 | 1.26 | Task 0.001 |
| | | | | | | A × T 0.01 |
| 5. No. of different words (in 200 words) | V | 66.3 | 79.9 | 78.9 | 79.7 | Age 0.01 |
| | S | 71.8 | 83.3 | 87.1 | 96.0 | Task 0.001 |

the related significant effects. On the story task, mothers said more, and used longer and more complex utterances involving richer choice of vocabulary. These task differences were all significant beyond 0.001. In addition, greater variation with age on the story than on the village task led to significant age \times task interactions with regard to words in disfluencies and grammatical complexity.

On four of the five measures, age proved to be a significant main effect, beyond 0.01 on two and 0.001 on another two of the measures. The only exception was words in disfluencies where the marked increases with age in mean scores did not prove significant due to very large variance in scores. Of the ten sets of means, six show continuing, though not necessarily strictly linear, trends with increasing age. Total words on both tasks show an increase up to age 4 and then a slight fallback to age 6. Mean utterance length on the story and number of different words on the village show a clear increase from 1½ to 2½ and then no change thereafter. The largest difference in means of groups of successive ages is between 1½ and 2½ years on both tasks on three of the measures. Tukey tests for multiple paired comparisons, following the ANOVAs, revealed that although many of the comparisons between mean scores for speech to 1½-year-olds and older groups were significant at at least 0.05 none of the tested comparisons between pairs of older groups proved significant. It should be remembered, however, that an *N* of only eight per group was involved. From these features of the age effects it can be concluded that, over the range 1½ to 6 years, age of child does have detectable effects on almost all features of mothers' speech that were investigated, that the general effect is one of continuing change with age, but that the most marked changes tend to occur between 1½ and 2½ years, and the significant effects are accounted for in large part by the differences in speech to the youngest children as opposed to all the children aged 2½ or older.

DISCUSSION

The findings that emerge from this study fit well with previous work and help complete quite a coherent picture of adult speakers systematically modifying their speech in the light of the persons being addressed. Granowsky and Krossner (1970) and Broen (1971) demonstrated differences in adult speech to other adults and to 5-year-olds. This present study confirms Broen's finding of differences in speech to 5-year-olds and to 2-year-olds. Furthermore, it suggests that the most dramatic modifications occur as the child progresses from 1½ to 2½ years in age. The gradual but statistically

nonsignificant changes in mean scores on several of the measures from 2½ through 4 to 6 might be taken as indicating continual, if not very marked, modification on the part of adults. The nonsignificance of these differences is likely to be a reflection of the small numbers of cases. Such an interpretation receives support from work carried out by Professor A. L. Baldwin and colleagues at Cornell (personal communication). With *N*s of 20 in each group, they found moderately significant differences on measures of grammatical complexity and words per utterance applied to speech of mothers to 3- and 5-year-old children.

The significant differences in speech to 1½- and 2½-year-olds agrees well with a recent article by Phillips (1973), who reported differences for 18-month-old and 28-month-old children. Like us, Phillips did not find significant differences due to sex of child. Her failure to find differences for 18-month-olds and 8-month-olds might suggest that in the first year and a half mothers do not vary their way of speaking to their children, but such a conclusion does not seem entirely plausible. Admittedly, attention and comprehension cues, which we assume are particularly important for the mother, may be less forthcoming from very young children, but a complete absence of speech modification by mothers seems unlikely in naturalistic settings. It may have been that, in the experimental setting, although the attention of the youngest children to the mothers' speech was not obtained, nevertheless the mothers felt obliged to keep speaking, not so much for themselves as Phillips suggested but for the experimenter. Such an effect appeared to occur with two, or perhaps three, of our mother-child pairs with 1½-year-old children. The young children did not appear to be reacting to the mother's speech but the mothers continued talking and in a more complex manner than was generally true of the other mothers with the youngest children. Snow (1970) found fewer modifications in mothers' speech when the target child was absent, and perhaps physical absence and "psychological" absence have similar effects.

If an experimental situation can fail to reveal effects that might be observable with naturalistic observations, there is also the risk that such a situation can create effects not normally present. Thus one hopes that the consistent findings emerging from controlled studies of interaction will be obtainable in less structured settings. In addition, it must be remembered that the present study, like a number of others, was conducted with a sample of well-educated middle-class mothers. The possibility of social class variations in the ways in which adults' speech to children comes to be modified remains to be studied. If the experimental findings can be generalized, then this line of research will have clear relevance both for reinstating the role of language

input, which has been devalued in many discussions of innate devices, and for developing adequate social interactional theories of language acquisition.

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