

Why we don't talk 'baby talk' to babies*

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ABSTRACT

The speech of 36 mothers to their infants in a face-to-face situation at ages 6, 13 and 26 weeks was compared with unfamiliar adults' speech to the same infants, the mothers' speech to an interviewer, and their conversations with the same children 2 years later. Speech to the infants was quite different from so-called 'baby talk', but contrary to other authors the speech to infants was even shorter, more repetitive, and more limited in content than the speech to language-learning children. Differences appear due to the infant's changing status in the relationship, from a potential to an actual conversant.

INTRODUCTION

'Baby Talk' (BT) is unfortunately misnamed: it refers to the speech of adults to children between the ages of 1 and 3 years. It has sometimes been called a REGISTER (Ferguson 1964, 1977) - a set of characteristics distinguishing language by social context of use rather than by linguistic community. In fact much of the linguistic interest in BT has centred upon its apparent universal characteristics, transcending a wide sample of languages. These characteristics fall into five general classes: (1) prosodic features - higher pitch, greater range of frequencies, more varied intonation (Sachs 1977, Garnica 1977); (2) lexical features - special forms like *potty* and *nana* (Ferguson 1964); (3) complexity features - shorter utterances, fewer embedded clauses, fewer verb auxiliaries, etc. (Snow 1977*a*, Furrow, Nelson & Benedict 1979); (4) redundancy features - more immediate repetition and more repetition of the same words or phrases over a

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period of time (Snow 1972); and (5) content features – restriction to topics in the child's world (Snow 1977*b*).

Although the present study concerns mainly features of the second and third classes – simplicity and redundancy in adults' speech to children – there is a crucial issue that arises in connection with all of the features of BT. This is the question of the age at which children begin to be addressed in those ways. If parents begin using BT around the time their children begin to comprehend speech or to produce one-word utterances, BT might plausibly be explained as simplification – either for the sake of linguistic instruction, or at least to facilitate the child's understanding. Brown (1977) reaches the latter conclusion; in line with Jakobson (1960: 125) who described parents' simplification of their language as an attempt to meet the child on common ground:

The so-called 'baby talk' used by the grown-ups when speaking with infants is a kind of pidgin, a typical mixed language, where *the addressers try to adjust themselves to the verbal habits of their addressees* and to establish a common code suitable for both interlocutors in a child-adult dialogue. (my emphasis)

When Brown & Bellugi (1964) found the mother of Adam speaking to him in short, simple sentences they made similar assumptions about her motives. Reports by Phillips (1973) and by Lord (1975) have suggested that parents only begin talking in BT around the end of the first year of their child's life.

However, this claim is inconsistent with the fact that at least some features of BT are used to infants, lovers, household pets, even to plants if one wants to 'baby' them. Snow (1977*b*, Snow, deBlauw & vanRoosmalen 1979) has reported a number of features of BT prevalent in mothers' speech to infants as young as 0;3. She concludes that these features are due to the mothers' attempts to maintain the semblance of a conversation despite the conversational deficiencies of their partners. The brevity and syntactic simplicity may result from the simplicity of content. Certain semantic features of the mothers' speech (e.g. references to the child vs. references to the wider context) changed between 0;3 and 1;6 as the infants became active conversational partners. There was no point at which the mothers 'began' using BT.

Newport (1976), on the basis of speech samples from 15 mothers of 1- to 3-year-olds, concluded that the brevity of their utterances was not necessarily associated with syntactic simplicity, and that it resulted from the content of mother-child conversations rather than from attempts by the mothers either to instruct the children or to adjust to their linguistic capacities. For example, the utterances were shorter to the younger children because of a higher proportion of imperatives and questions with deleted auxiliaries. Newport proposed that the different features of BT can be accounted for only by a set of loosely related factors including the limited domain of mother-child interactions and the need

to get and hold the child's attention. The latter motive may also be responsible for some of the features that BT shares with non-linguistic maternal behaviour. As Sachs (1977) points out, the high pitch and other phonological features of BT may have evolved because they elicit orienting behaviour and become signals to the infant that he is being addressed.

Issues surrounding BT are thus of interest to investigators of interaction between parents and younger infants. For example, while Snow (1972) and others have noted repetitiveness as one of many special features of maternal speech to infants, Stern, Beebe, Jaffe & Bennett (1977) have found that maternal speech is only one of many domains in which maternal behaviour in face-to-face play is highly repetitive and well adapted to the goal of capturing and maintaining an infant's attention. A mother (in fact, any adult playing with an infant) superimposes minor variations (novelty) upon repeated (familiar) movements. As the infant gets older, rhythmicity in the mother's behaviour declines in favour of variety (Stern & Wasserman 1979). In short, we might modify Brown's (1977) explanation to say that rather than trying to make herself understood, the mother is trying to make herself interesting to her infant. This explanation is similar to Sachs' but also compatible with Snow's.

It is difficult to theorize about the relation between BT to young babies and BT to language learners for a number of reasons.

(1) The corpus of mothers' speech to young infants that has been analysed to date is much smaller than the corpus of BT to 1- to 3-year-olds, and consequently we know much less about it.

(2) The various studies have used different measures. For example, Stern's definition of repetition in mothers' speech to infants does not permit comparison with Snow's (1972) or Newport's (1976) measures of repetition in speech to 2-year-olds. This is important because the concept of REGISTER – a set of rules for a special domain of language use – implies a coherent structure into which a speaker shifts as a musician changes to a new key. The kind of data presented by Newport, indicating that BT is at best a set of loosely related features, raises the question whether they deserve the term REGISTER at all.

(3) The small amount of data in previous studies makes it impossible to assess intercorrelation among the measures. For example, are repetitiveness and lack of complexity two orthogonal dimensions of BT, or really two symptoms of the same underlying mechanism?

(4) Although there has been much speculation, we have no evidence regarding the role of the child in eliciting features of BT, or of the infant in eliciting repetitive and perceptually salient maternal behaviour. In fact we know that experience with infants is not a factor in producing BT in either adults (Snow 1972) or 4-year-olds (Shatz & Gelman 1973), and that both adults and 4-year-olds will use BT intonations to a doll when merely asked to pretend it is a 'baby'

(Sachs & Devin 1976). So it is not the infant or child that elicits the special register, but the IDEA of an infant or child. Still, there may be individual differences among mothers in these domains, and if so do they originate with the mothers or with individual differences in their infants?

In an attempt to address these issues I collected a large sample of mothers' utterances during videotaped face-to-face play with their infants. Measures similar to some of those used by other investigators were computed for all 36 mothers at each of three ages: 6, 13 and 26 weeks. The relation among those measures forms the core of the analysis, but they will also be compared with the following additional data: the speech of one female investigator to all of the same infants at 6 and 13 weeks; my own speech to all of the infants at 26 weeks; the speech of the mothers to another female investigator in an interview; and 22 of the same mothers' speech to their children on each of two occasions two years later.

METHOD

Subjects and data collection

Our initial sample of 52 mothers was recruited at the time of their infants' birth, for a longitudinal study of the development of communicative skills in infants. All were white, carried their babies to full term without major complications, and spoke English as their first language. In other respects they represented the wide range of differences one finds among working-class Chicago families. Face-to-face play was videotaped in the subjects' homes when the infants were 6, 13 and 26 weeks of age. Only the 36 mothers of whom we obtained codable videotapes at all three ages were included in the present study. Since one mother had male fraternal twins, there were 37 infants, of whom 17 were female.

In the face-to-face play sessions each mother sat in a straight chair holding her infant freely in her lap. She was asked to 'see if you can get his attention, and play with him as you normally do'. We explained that we needed her to sit up rather than playing on the floor or a bed, in order to standardize the situation for different babies. Sessions lasted 4 to 7 min (mean 300 sec), depending on the baby's continuance.

To test each infant's response to a friendly stranger, we included interactions with one of the investigators. These lasted between 1 and 5 min (mean 160 sec). We attempted to use a consistent strategy of interaction across babies (maintain their interest and comment upon whatever they seemed to be doing) while letting the moment-to-moment tactics vary in response to their behaviour. Since our original interest was in the babies' reactions, we had no thought at the time that our own behaviour would ever be transcribed or analysed.

At 6 and 13 weeks a female investigator served as the stranger, immediately following the mother-infant play. At 26 weeks the author interacted with the baby at the beginning of the session and the mother's turn came about half an

hour later following a problem-solving task. In both cases the start of the play period might be delayed in order to feed or rest the infant.

Coding

All 222 transcripts of adult speech (37×3 ages $\times 2$ adults) were typed into a computer. Ten videotapes were retranscribed by the same person with exact agreement on more than 90% of the utterances in every session. The author checked the discrepancies and found that relatively few of them would have placed an utterance in a different coding category. The large corpus of speech (13,574 utterances from the mothers and 7,602 from the strangers) necessitated a computerized coding procedure, which in turn required precise definitions with no room for judgement on the part of the coder. For example, we could not replicate Snow's (1972) 'semantic repetitions' and we could count words but not morphemes.

First, the computer eliminated all utterances marked '(To camera)', '(To father)', etc. and all utterances consisting solely of laughter or of funny noises (e.g. clicks, whistles). If such noises accompanied an utterance, they were deleted from it. Transliterated sounds (e.g. 'Rrruff!') were treated as words. (The transcriber had been instructed to standardize the spelling of such verbalizations when repeated within a session.) Finally, all utterances containing any inaudible words were eliminated. (These constituted less than 1% of the total.) The definition of an utterance, then, was a unit of speech (using Brown's (1973) rules based upon intonation contour and segmentation) directed to the baby, containing at least one English word or nonsense word and no inaudible words.

Utterance rate. Since each mother-infant session had previously been timed precisely, we were able to compute utterances per minute. This variable was not available for the stranger-infant interactions. All of the following variables were computed for the strangers as well as the mothers.

Words-per-utterance. All punctuation and all transcriber's comments (in parentheses) were deleted from each utterance. The number of words in each session was then counted and divided by the number of utterances.

Phatics. We defined a class of one-word greetings, consisting of the following utterances: *Huh, Uhuh, Right, Sure, OK, Yes, Yeah, Yeh, Yep, Yay, Hello, Hi, Howdy, Hm, Aw, What, Well, Ah, Oh, and Ooh.* All of these emerged after an exploratory reading of 10 transcripts. They were usually responses to the infant's attention or expressive action; in contrast to exhortations, for example *Come on, Lookit,* or the baby's name. The variable derived for each session was the number of one-word greetings (phatics) divided by the total number of utterances.

Before counting repetitions we deleted all of the following words from the transcript: *a, an, the; is, am, are, was, will, were, be, being, been; and, if, or, but; at, to, on, in, with, of* and *for*. This decision was based on the high frequency of these words; if we had included them, almost every utterance would have been a partial repetition. Other words in the same grammatical categories such as *because* occurred rarely (in fact, not at all in the 10 transcripts sampled).

The following repetition variables were then computed:

Exact-immediate. The percentage of all utterances that were repeated exactly, as the next utterance.¹ The pair of utterances *Hi. Hi.* would count as two phatics and one exact-immediate repetition.

Partial. Of those utterances NOT found to be exact-immediate repetitions, in what percentage did at least one word reoccur in any of the next three utterances? Any variation in spelling was treated as a non-repetition; *you'd* was not treated as a repetition of *you*. On the other hand the present and past tenses of *read* would be read by the computer as identical. However, subsequent inspection of many transcripts failed to turn up any instances of this kind.

Type-token. We computed a type-token ratio for each session, not of words but of whole utterances. This variable was a rough measure of the amount of variety found across the whole session. One minus this variable would be the percentage of exact, not necessarily immediate repetitions.

RESULTS

In Table 1 are presented the mean values for the mothers' speech to their infants, and the strangers' speech to the same 37 infants.² It should be noted that the numbers would be different for different definitions of REPETITION, PHATIC UTTERANCES, etc. This is less true, however, of the relationships among the variables and of the comparisons across conditions.

The same stranger saw each infant at ages 6 and 13 weeks; her mean scores were nearly identical at the two times (combined in Table 1), though very

[1] This measure would be expected to be inflated by our having deleted the 23 functor words listed above. However, we actually counted exact repetitions both before and after deleting those words, and in every session we obtained nearly the same count. Sequences such as *You hungry? Are you hungry?* (an exact repetition only after we deleted *Are*) were very rare. None of the results of this study were appreciably affected by the deletions that we made, as explained above, to avoid meaninglessly high rates of partial repetition.

[2] Throughout this paper *N* is the number of infants, but statistical significance is based on one less degree of freedom because of the one mother with twins. In general, parameters of her behaviour with the two boys were not identical, but closer than those of two different mothers in the sample.

TABLE 1. Mean scores

		Mothers ^a to inter- viewer	Mothers ^b to 2-year-olds	Mothers ^c to infants	Female to infants ^d	Author to infants ^e
Utterance	\bar{X}	—	14.5	21.0	—	—
rate per min	S.D.	—	4.3	7.2	—	—
Words per	\bar{X}	11.0	3.68	2.76	4.37	3.13
utterance	S.D.	< 1.0	0.76	0.65	0.57	0.43
% Phatic	\bar{X}	< 1.0	—	21.1	17.0	27.3
utterances	S.D.	< 1.0	—	9.5	5.6	10.6
% Exact	\bar{X}	0.0	3.8	16.0	3.8	10.8
repetitions	S.D.	(0)	3.0	7.8	3.7	5.0
% Partial	\bar{X}	50.0	31.0	33.4	50.5	33.3
repetitions	S.D.	~8	10.2	9.7	8.5	8.3
Type-token	\bar{X}	0.990	—	0.549	0.804	0.737
ratio	S.D.	< 0.01	—	0.153	0.079	0.086
(utterances)						

^a *N* = 4 selected at random; we stopped because data were so consistent.

^b *N* = 22 of the same mothers and children shown in the next column, sampled at 2; 2 and again at 2; 6.

^c *N* = 36 mothers at all three ages combined.

^d Speech of one assistant to 31 infants at 6 weeks plus 27 at 13 weeks. Another assistant substituted at the other visits, but his data have been excluded from this paper in order to keep a standard basis of comparison.

^e *N* = 37 infants at 26 weeks only.

different from those of the mothers. The author's speech to the babies (26 weeks) showed yet a third pattern. Our principal concern, however, was with the mothers. They repeated about one utterance in six immediately and exactly, and about a third of those not repeated exactly were repeated partially within three utterances. Thus the cumulative probability of at least one content word from an utterance occurring again in one of the next three utterances (approximately 9 sec), was 44%.

Table 1 shows that the female stranger, whose utterances to the babies were much longer than those of the mothers, rarely repeated herself exactly though she was more likely to repeat one or more words. This suggests that exact-immediate repetition is a different matter from partial repetition, which mainly reflects the continuity of subject matter over a sequence of utterances. The stranger's total monologue contained a much higher proportion of unique utterances (type-token ratio) than did the mothers'. Thus it was characterized by more variety as well as more continuity. Since the stranger's utterances were 60% longer than the mothers', it is not surprising that they were less likely to be repeated exactly either immediately or elsewhere in the session, yet were more likely to be repeated in part.

Table 1 also presents comparable data on the same mothers' speech to a female interviewer, face-to-face interactions which were fairly comparable to

their monologues with the infants since the mothers did 90-95% of the talking while the interviewer nodded and smiled. The measures were computed in exactly the same way except that the units of analysis were clauses (containing one or more noun phrases with conjunctions but only one verb). It was impossible to segment the run-on speech reliably into 'utterances'. Some phrases were counted as clauses even when subject and/or verb were only implicit (e.g. *Never*).

Because each individual mother yielded the numbers shown in Table 1 (based on her first 100 clauses), we stopped after four mothers. We found very few one-word utterances from our list of phatics (and these were appropriate replies like *Yeah* and *Sure*) and no exact repetition at all, either immediate or later (except for those occasional one-word replies). However, PARTIAL repetition was at least as high in the mothers' speech to the adult as in their speech to the babies, and for the same reasons: continuity of subject matter and parallel sentence constructions.

Kaye & Charney (1981) studied the conversational interactions of 22 of these mothers with their children two years later, at 2; 2 and 2; 6. Rates of exact and partial self-repetition by the mothers³ are included in the second column of Table 1 for comparison. Again, partial repetitions occurred frequently, but exact repetition was much less common than to the infants.

Relations among variables

We next explored the intercorrelations among our measures within each session. The first result was that at all three ages, in the strangers' speech as well as in the mothers', utterance length was significantly associated with a low rate of exact-immediate repetition (mean correlation = -0.50, d.f. = 35, $P < 0.01$) and a high type-token ratio (mean $r = 0.66$, d.f. = 35, $P < 0.001$), the type-token ratio being significantly associated with a low rate of exact-immediate repetition (mean $r = -0.59$, d.f. = 35, $P < 0.001$). In other words it was the shorter utterances which were more likely to be repeated exactly, both immediately and throughout the sessions. This was easily confirmed by inspection of the original transcripts. We should therefore think of these three variables as measuring the same basic aspect of a set of utterances: their tendency to be long-and-unique vs. short-and-repetitive. Accordingly they were reduced to one variable, weighting each of the three original measures equally by taking the mean of the three z -scores for each subject (reversing the sign for exact-immediate repetitions). Henceforth we shall simplify the presentation of results by substituting this variable, 'length and variety', for the original three.

[3] Not discussed by Kaye & Charney. Details are available from the author.

For the mothers, once these three variables were grouped together the remaining measures were essentially uncorrelated variables as Table 2 shows. For the strangers, the situation was different. In those sessions when the strangers said more phatic utterances, there was less variety (i.e. more utterances repeated exactly) than in the sessions containing few phatics. This is not surprising: the phatics accounted for most of the strangers' short utterances. Some of the infants (or something else about those sessions such as time of day, other people present, etc.) apparently elicited more phatics than did others.

Among the mothers (where the variance was due to differences among the speakers as well as to differences among the infants and other aspects of the settings), the length and variety of utterances and the proportion of phatic greetings were unrelated variables. The reason was that the mothers said many two-word utterances, as well as one-word utterances not in the phatic category (e.g. *No*, *Hey*, *Lookit*, and the baby's name).

TABLE 2. *Intercorrelation of variables*

	% Phatics	% Partial	Utterance rate
Mothers (mean correlation at each of 3 ages, $N = 37$)			
Length and variety	-0.08	0.06	-0.21
% Phatics	—	-0.19	-0.06
% Partial repetition	—	—	-0.01
Female stranger (mean correlation at each of 2 ages, $N = 31$)			
Length and variety	-0.65***	0.57***	—
% Phatics	—	-0.46**	—
Author, 26 weeks ($N = 37$)			
Length and variety	-0.45**	0.09	—
% Phatics	—	-0.31	—

* $P < 0.05$ ** $P < 0.01$ *** $P < 0.001$.

The female stranger was also different from the mother in that her rate of partial repetitions was highly associated with the length and variety of her utterances to any given infant (and thus negatively associated with the proportion of phatic greetings in the session). Among the mothers, partial repetition rates were independent of the other measures. In fact, partial repetition probably does not belong on the list of special features characterizing mothers' speech to infants, since as we have seen it was even more frequent in their speech to the adult interviewer (Table 1).

Independent effects

Our mothers represented a good range of educational (social class) levels: 8 college graduates, 19 high school graduates about half of whom had a year or two

of nursing or technical school, and 9 high school drop-outs. A sex \times age (repeated measure) ANOVA was performed for each dependent variable in the mothers' speech to their infants, with ranked educational level as a covariate. Two of the variables were significantly affected by the infant's age. Exact repetition increased ($F = 3.87$, d.f. = 2, 64, $P < 0.05$) but not because of the repetition of phatic greetings, for those declined with age ($F = 7.67$, d.f. = 2, 64, $P < 0.001$). These results are easy to interpret in light of what is known about the decline in infants' attention to their mothers' faces over this period. These babies attended to their mothers' faces 55% of the time at 6 weeks, 36% at 13 weeks, and only 29% at 26 weeks (Kaye & Fogel 1980). So if the phatic utterances are 'greetings' responding to the infant's attentive expression, we should expect them to decline over the three sessions as they do. The increase in exact repetition as the infants looked less at their mothers' faces suggests that attempts to gain infants' attention were being repeated: 'If at first you don't succeed, try, try again.' Despite the age trend in exact-immediate repetitions, there was not a significant change in the 'variety' measure with age.

There were significant differences due to the infant's sex and mother's education. Mothers said longer, more varied utterances to girls than to boys ($F = 6.82$, d.f. = 1, 32, $P < 0.01$) and mothers with more education spoke to their babies with longer, more varied utterances ($F = 5.45$, d.f. = 1, 32, $P < 0.05$). There were no interaction effects. Frequency of partial repetition and rate of utterances per minute were unrelated to education, the infant's sex, or age. Phatic utterances were affected only by the infant's age as mentioned above.

In the female stranger's speech a sex \times age (6 and 13 weeks only) repeated measure ANOVA on each of the dependent variables found no significant effects. Like the mothers, however, the female investigator said longer, more varied utterances to girls than to boys ($0.05 < P < 0.10$). Her speech was unaffected by the mothers' educational level.

None of the variables in the author's speech to the infants was affected by their sex or their mothers' education.

Individual differences

All of our variables in the mothers' speech to their infants showed significant stability over the three observations, as indicated in Table 3. Stability was completely lacking in the stranger's speech to individual babies, strongly suggesting that the individual differences in the mothers' data were really due to differences among the mothers and not to any stable factors in the infants' behaviour or other aspects of the setting.

This conclusion is further supported by two additional facts. First, there were no significant correlations between the mothers' and stranger's speech with the same infants. Secondly, there were no significant correlations between these

TABLE 3. Correlation over time, parameters of speech to infants
(controlling for sex and mothers' education)

Mothers ($N = 37$)	6-13 weeks	13-26 weeks	6-26 weeks
Length and variety	0.33*	0.61***	0.09
% Phatics	0.30*	0.29	0.23
% Partial	0.23	0.32	0.40*
Utterance rate	0.43**	0.50**	0.55***
Strangers	($N = 25$) ^a	($N = 27$) ^b	($N = 31$) ^b
Length and variety	0.09	0.05	0.19
% Phatics	0.02	0.14	0.05
% Partial	-0.18	-0.04	0.18

* $P < 0.05$ ** $P < 0.01$ *** $P < 0.001$.

^a Same stranger at 6 and 13 weeks.

^b Different stranger at 26 weeks.

maternal speech variables and any measures derived by Kaye & Fogel from the infants' behaviour or the mothers' response to it.

Since the infant's sex and the mother's education were constant factors across all three observations, and since at least one of the variables was related to those factors, it is important to note that the stabilities shown in Table 3 are partial correlations after controlling for sex and education.

Follow-up measures

Kaye & Charney (1981) tested these children's language production (2; 2 and 2; 6) and language comprehension, social interaction with the author, and puzzle performance (2; 10). None of these measures was predicted by the ways their mothers had spoken to them in our infancy session (one of 32 correlations was significant at the 0.05 level), but they were rather well predicted by the mothers' educational levels. They were not related to sex: boys and girls had virtually identical mean scores on every measure including the PPVT.

Furthermore the mothers' BT itself was not predicted by their speech to the infants, in terms of individual differences. Social-class differences in repetition and complexity persisted, but after controlling for mothers' education the only variable in which we found individual continuity to the later period was utterance rate (see Kaye & Charney 1981).

DISCUSSION

The study has presented some descriptive data that should be fairly representative of English-speaking white American mothers. Their speech to their young infants, long before it could be explained as an attempt at language instruction,

was even more 'babyish' than the 'baby talk' observed in adult speech to 1- and 2-year-olds. Perhaps we should distinguish at least two levels of BT. The young babies were addressed in BT₁, consisting of very short, repetitive utterances. In addition to partial repetition of content over a series of utterances, which is characteristic of ordinary discourse, they repeated one utterance in six immediately and exactly, which is not.⁴ About 45% of their utterances were said more than once in the course of a session.

Contrary to Phillips' (1973) assumption of a 'floor' at around 3.5 words per utterance 'somewhere around the first birthday', we found 2.8 words per utterance to infants in the first 6 months. So the change that takes place at the end of infancy (from BT₁ to BT₂) is a lengthening, not a shortening of the mothers' utterances. The brevity (and perhaps other aspects of the simplicity) of adult speech to 2-year-olds cannot be a matter of adjusting downwards in direct response to the child's production or comprehension abilities.

As to repetition, Snow (1972) found 2.9% of the mothers' speech to 2-year-olds was repeated exactly, within three utterances. We found 4.6% at 26 months and 3.0% at 30 months, within one TURN (which usually meant only one or two utterances – but it would not increase the count much to look ahead to the third utterance). These estimates of repetition in BT₂ are very close considering that Snow's task for the mothers was a bit different from ours. They compare with less than 1% for Snow's mothers' exact repetitions to 10-year-olds in the same situation, and 0% for our mothers' speech to the interviewer. So again, the greatest deviation from speech to adults was found in BT₁, the speech to the infants (16%), rather than to the language-learning children. Yet the infants did not respond verbally no matter how many times the mothers repeated themselves. Repetition does not seem to be for the sake of instruction or comprehension.

The most striking characteristic of BT₁ was unique to that period. About 21% of the utterances were one-word greetings or acknowledgments of real or imagined communications from the baby. Although these words are common enough in later speech to children (*Sure, Yeah*, etc.) their high frequency of occurrence in isolation, as complete utterances, is a special characteristic of speech to young infants. The *huh?* to our 2-year-olds, in addition to being far less frequent, was almost always simply a request for repetition or clarification. It sometimes played a similar role in BT₁, but was more often used as if to mean 'Isn't that right?' with elongated, falling intonation like *Sure* and *Yeah*. These phatic utterances or

'back-channels' (Duncan & Fiske 1977) were more common in the adult-adult interviews, on the part of the INTERVIEWER: they are used by all of us when another person has the floor. The phatic utterances were rare in the speech to the 2-year-olds because in the picture-book situation the children did not take the floor for more than one utterance at a time. If they were common in the speech to the infants, perhaps it means the mothers were pretending the infants did have the floor.

Finally, LEXICAL BT was almost completely absent from BT₁. Diminutive and 'nursery' forms like *fwoggy* for a toy frog occurred very rarely, usually naming something handed down from an older sibling. This then is one respect in which BT₁ is indeed more like speech to adults than BT₂, and for which Jakobson's explanation may be valid. Parents do not make up babyish forms until the baby is old enough to understand them.

The idea that BT is a simplification of speech for the benefit of the child's understanding has been seriously challenged by several authors. Newport (1976) showed that the shortening of some utterances is due to deletions, interrogatives, and other transformations that appear to be the very opposite of syntactic simplification. Schaffer & Crook (1979) found an association between child's age and the length of utterances urging the child to take action (at 2; 0 vs. 1; 3), but not the length of utterances directing his attention. Newport, Gleitman & Gleitman (1977) could find no evidence that the extent to which mothers used BT facilitated their children's language development. Newport & Gleitman (1979) showed experimentally that the repetition of requests does not increase the probability of two-year-olds' complying with them.

On the other hand, in a very small sample, Furrow, Nelson & Benedict (1979) did find that a number of measures of mothers' BT, to children of 1; 6 whose MLUs were 1.0, predicted the children's language development at 2; 3. The willingness of Furrow *et al.* to assume a causal connection is unjustified for several reasons, one of which is that they ignored educational differences among the families that could have accounted for both the use of BT and the differences in language development, without the former causing the latter. However, Furrow *et al.* make an important point: there is no reason to assume parental speech will have the same effect at different ages, and there is every reason to suppose it will respond to different aspects of the child's language behaviour at different times.

The Kaye & Charney data present a further challenge to the linguistic simplification idea. The length of mothers' utterances at 2; 2 or at 2; 6 was not correlated with the children's competence. In fact the mothers produced more nonverbal turns and relied on gestures (pointing or looking at the child expectantly) more at 2; 6 than at 2; 2, and more with children who had higher production and comprehension scores. This suggests that the children's increasing communicative competence broadened their abilities to comprehend nonverbal

[4] Messer (1980) found the repetition of specific referents and specific utterance types to be significantly higher within series of utterances independently designated as 'verbal episodes' than across episode boundaries. Blount & Padgug (1977) and Schaffer & Crook (1979) also make this point. Other parameters of a mother's corpus of utterances can also be explained by the episodic structure (see below).

signs as well as speech. In this sense the mothers' whole complement of communicative behaviour grew more sophisticated, though the utterances themselves did not.

Furrow *et al.* report that their mothers' MLUs at 1;6 negatively predicted child MLU at 2;3 (shorter maternal utterances predicted more rapid MLU growth in the child). At 2;3, however, the relation between mother and child MLU was positive, as in our data. The present study has shown that mothers' utterances do not get shorter; like previous investigators, Furrow *et al.* found 4 words per utterance at both 1;6 and 2;3. This can only mean that individual mothers differ during the first two years in the following way: some increase their MLUs faster than others do. What Furrow *et al.*'s findings suggest, then, is that the mothers who help their children develop verb and noun phrases are the ones who do not shift too rapidly towards longer, more complex speech, but keep their own utterances just a little longer, on the average, than their children's.

All of these results show that the causes and effects of simplicity and repetition in mothers' speech to children at various ages are complex. Mothers' speech becomes continuously richer as the dialogue between infant and mother grows richer. The enrichment takes different forms at different times, so that discontinuities and even reversals may appear in any given measure.

'To whom am I speaking?'

Two questions remain. (1) What is it that mothers are really doing in the early months, before their infants are capable of holding up one end of a verbal exchange, that could explain the existence of stable individual differences in BT1? (2) Why do those individual differences seem to have no effect on outcome measures such as the PPVT, while social class for example does have an effect?

If we may omit some of Jakobson's words, mothers and other adults speaking to babies do indeed 'adjust themselves to the . . . habits of their addressees'. They adjust not to the verbal habits of their addressees but to the general structure and timing of infant behaviour (Kaye & Fogel 1980). The infants' behaviour comes in brief repetitive bursts. It would be much odder to respond to such expressions with long involved sentences than with short greetings, exhortations, and simple comments. Mothers mirror their infants' behaviour back to them using speech as well as facial expressions and gestures.

Despite the realistic adjustment to the structure and timing of the infant's behaviour, there is still the unrealistic element in all of the attributions and interpretations of the baby's expressions. There is as much pretending in the mother's patter to her infant as in her speech to the dog, or her plants, with one difference: in the baby's case the fantasy is eventually going to come true. What

each mother does in different ways is make the baby into a person and herself into his best friend. This fantasy endures into the language-learning years. Even as the discourse changes from one-sided to two-sided, with the child taking real turns, as the topic changes from here-and-now-and-you to a shared perspective on an outside world, still the dialogue will be much less symmetrical than the mother pretends. We find the mother only slowly relinquishing her role as manager of both sides of the dialogue, over the course of the third year (Kaye & Charney 1981).

This pretending is partly what Snow (1977*b*) and others have described as making up for the deficiencies of the conversational partner. It is also, I think, a matter of the mother's active construction of a theory about who her baby is. Person perception, as Heider (1958) wrote, is making oneself feel one knows the other's intentions, motives, sentiments and beliefs, and understands how the other perceives oneself. Is that not the substance of what these mothers are trying to do?

<i>Mother 1</i> (male, 6 wks)	<i>Mother 2</i> (female, 6 wks)
Come on.	Is that a burp?
Talk.	Huh?
Talk to me.	Or are you going to get the hiccups?
Can you talk to me?	Huh?
(Laugh) Say something.	You going to get the hiccups?
Come on.	Huh?
Talk.	Yeah.
Can you talk?	Hi, there.
Can you say something?	You look like you're just concentrating
Well, talk.	so hard.
Well, say something.	Roseann.
Can you say Mama?	Hello.
Well, come on.	What?
Come on.	What?
Come on.	Huh?
Come on.	Hey, you follow me, don't you?
Really?	You follow my voice.
Hi.	You follow my voice more than you
Say something.	follow me.
Come on.	Yes.

Mother 1 kept up this series of imperatives, polite requests, and exhortations throughout the session and at the later sessions as well. Mother 2 continued her narrative discussion of the baby's appearance and behaviour, making no demands or requests of the baby at all. Thus her utterances were longer, more varied, but

also contained more phatic greetings than Mother 1. These and other parameters of their speech are shown in Table 4 (based on the whole sessions from which the examples above were taken). Clearly their speech was similar in some respects – all grammatical, all referring to the infant. But in some ways they differed, and these seem to have less to do with 'register' than with the ways they conceived of their roles with their infants.

We found stable individual differences among our 36 mothers in the characteristics of their speech to the infants, differences attributable to the mothers rather than to anything about the different infants that could be tapped by looking at the responses of a stranger to all of them. There was less relative variance among the strangers' sessions with each of the infants than among the mothers, no correlation between the stranger and the mother with the same infants, and no stability in the one stranger's behaviour with individual infants over time.

TABLE 4. *Comparison of two mothers*

	Mother 1	Mother 2
Words per utterance	2.81	3.22
% Phatics	14.6	28.6
% Exact-immediate repetition	14.9	6.3
% Partial repetition	57.5	42.2
Type-token ratio (utterances)	0.458	0.755
% Exhortations	18.8	12.2
% Specific requests	43.8	0
% Utterances without verbs	18.8	53.1
% Direct deixis (<i>That's a doggie</i>)	0	0
% Indirect deixis (<i>Use those muscles</i>)	8.3	14.3
% Fragments (<i>Huh?, Once more, Cross-eyed and all</i>)	24.0	56.0
Deleted auxiliary (% of questions)	20.0	50.0
% Ungrammatical	0	0
% About child	95.8	93.9

The differences among our mothers, like those reported among children in such studies as Templin's (1957), were differences in production frequency rather than in the competence to produce the forms at all. It is worth noting that one does not find social-class differences in every aspect of mothers' speech (Kaye & Charney 1981, Snow, Arlman-Rupp, Hassing, Jobse, Joosten & Vorster 1976). It would be a mistake to try to reduce the determinants of individual maternal speech styles to the single dimension of social class.

The element of pretence is what introduces so much opportunity for variation among mothers, and particularly for the expression of cultural values regarding the infant's capacities, feelings and social role. The individual differences in maternal language input to the infants and children in this study were less a matter of linguistic differences among the mothers, and still less of different

attitudes about linguistic instruction, than they were differences in expectations of the baby as a person and expectations about how one ought to relate to a baby (Kaye 1980). Authoritarian vs. ego-building vs. egalitarian attitudes have consequences in the complexity and structure of the child's linguistic environment, from birth.

The extent to which parameters of maternal speech can reflect differences in expectations for the infant is also illustrated in our findings with respect to the sex differences. The mothers' speech was significantly different to the boy vs. girl infants, but not to the boy vs. girl 2-year-olds. It is possible that sex differences in the young infants – undetected by us – could have elicited the mothers' differential speech to them, but it is more plausible that the longer mean utterances to the girls resulted from the infrequency of imperatives as illustrated in the example above, as a direct result of expectations about girls vs. boys and about mother-daughter vs. mother-son relations. The baby's identity as a person was still very much dependent upon the mother's fantasies about him or her. By 2; 2 and 2; 6 these expectations had been modified by the reality of each child's individuality – which, in our sample, meant no sex differences.

SUMMARY

Although BT differs from adult speech, it is not true that mothers switch from adult speech to BT at the end of the first year. The way they talk to babies prior to that time (BT1) is even more different from adult speech, in some respects, than BT2 is: speech to babies is more repetitive, more abbreviated, and serving a number of special functions. BT2 is really an elaboration, relative to what precedes it. We must also conclude the following.

(1) The particular motive to address the child on his own linguistic level cannot account for the special characteristics of speech to infants.

(2) Individual characteristics of the babies did not affect the measured characteristics of their mothers' behaviour.

(3) Some basic differences between the two situations (speech to infants and speech to 2-year-olds) including the topics discussed and the roles played by mother and child, produce big differences in the various parameters of the mothers' speech. In fact, among the few features of BT that were analysed in this study (and we assume this would be true of many features that were not analysed), some are continuous between the two periods and some are not. This raises the question whether BT really exists as an integral system at all.

(4) Within a given period of a few months, and with the interaction situation held constant, there are stable individual differences among mothers in these variables. In Newport's (1976) terms, after the gross adjustment is made to the nature of what is possible and appropriate in interaction with a child at a certain age, there is still room for fine adjustment by individual mothers, and we have no evidence that this fine adjustment depends on individual characteristics of the child.

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