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ABSTRACT

Two hypotheses related to the emergence of multiword speech were explored: (1) that multiword speech follows developments in children's ability to map communicative intents to single-word expressions; and (2) that the acquisition of these mapping principles paves the way for the emergence of syntax. The developments consist of an increase in the use of multiple realization rules for the same intent and an increase in the use of variable-type, selective realization rules. Sixteen 12- to 29-month-old children were videotaped six times in a year. The emergence of syntax was found to follow by 0-6 months a steep increase in the use of multiple mapping rules for the realization of the same intents in one-word utterances, as well as an "explosion" in the use of variable-type mapping rules. The results raise the possibility that an understanding of the componential structure of communicative intents, and of the ways selected components may be mapped to expressions, is a necessary antecedent to understanding the mastery of patterned speech. (Author/SH)

The Expression of Communicative Intents in Single-word Utterances and the Emergence of Patterned Speech

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Abstract

THE EXPRESSION OF COMMUNICATIVE INTENTS IN SINGLE-WORD UTTERANCES AND THE EMERGENCE OF PATTERNED SPEECH

The emergence of multiword speech was hypothesized to follow developments in children's ability to map communicative intents to single-word expressions. Sixteen 12-28 month old children were videotaped 6 times in a year. The emergence of syntax was found to follow by 0-6 months a steep increase in the use of multiple mapping rules for the realization of the same intents in one-word utterances, as well as an "explosion" in the use of variable-type mapping rules. The results raise the possibility that an understanding of the componential structure of communicative intents and of the ways selected components may be mapped to expressions, is a necessary antecedent to the mastery of patterned speech.

The orthodox viewpoint regarding the relationship between language and communication is that the two represent separate and independent mental domains. This viewpoint can, I think, be traced back to the father of modern linguistics, de Saussure (1922), who made a clear distinction between what he saw as two separate entities, la langue and la parole. La language, language proper, he saw as a system of symbols and of rules for their meaningful combination. This system is autonomous and independent of its possible uses or users; both the symbols (words) and grammatical rules can be defined on a context-free, abstract level. The other entity, la parole, speech, he saw as, properly speaking, an extralinguistic activity, one of the uses the linguistic system can be put to. On this conceptualization, we possess as adults two kinds of skills or competencies: a language competence, consisting of the knowledge of context-free word meanings and of an equally context-free grammar, and a communicative competence, consisting of the knowledge of how to use speech in order to communicative with other people. The two types of knowledge appear, on this viewpoint, as independent of each other.

When we are thinking of young children's acquisition of their very first system of language, the orthodox viewpoint would claim that two parallel processes of development are taking place: language development proper, consisting of the learning of a vocabulary and a grammar, and communicative development, learning how to use one's store of words to express various meanings and communicate these to others, as well as learning to interpret what others say as expressions of their intents and meanings.

There is, however, another way of conceptualizing language, and in that framework, the distinction between language and communication disappears. There are various philosophers, linguists and psycholinguists, who see linguistic forms (words, grammar) as tools for the purpose of communication, at the most a set of subordinate units to be made use of in the construction of decipherable messages. If indeed an implicit, internalized linguistic rule system exists, it would take the form of "production rules", namely, procedures for verbally expressing various kinds of communicative intents. All other rules of language (syntax, morphology, lexicon) appear in this view mere components of such a system of production rules.

If this view, best represented by the late work of Wittgenstein (Wittgenstein, 1953, see also Allwood, 1981; Alston, 1968; Shanon, 1980; Strawson, 1970), is accepted as a framework for thinking about language acquisition, it immediately appears that developments in children's early language abilities cannot be independent of developments in their communicative skills. On the contrary, the two should be intimately connected. The work to be presented in this paper is in a way a test case for this controversy, or rather one of a series of test cases. It concerns the question whether the emergence of syntax, or more cautiously, patterned, multiword speech, is tied to developments in children's communicative abilities.

Looked at it from a communicative point of view, it immediately becomes evident that the emergence of multiword utterances in children's speech constitutes at the same time a novel departure in their ability to map communicative intents to verbal expressions. As a piece of verbally expressed communication, a multiword utterance in most cases is the simultaneous and ordered realization in verbal form of two or more elements of the communicative intent underlying the utterance. The usual treatment of the emergence of patterned speech concentrates on the element of novelty inherent in the use of word order as a marker of meaning, or in the simultaneous control, in a single utterance, over two or more words. It is often overlooked that the ability to selectively realize two or more

elements of a communicative message is by itself a developmental achievement.

That this is so becomes evident when we examine how beginning speakers map their intents to words. Children at the onset of speech tend to possess only a single way for expressing a given communicative intent (Ninio, 1990), and that tends to be a fixed expression that functions as a general, unmarked form for that type of intent, regardless of the specifics of the message (see also Barrett, 1981; Bloom, 1973; Clark, 1978; Griffiths, 1985; Halliday, 1975; Weisenburger, 1976). For instance, "mommy" functions for many children as a generalized request form, "this" as a generalized attention-getter, "thank-you" or its variants as a marker of object transfer and so forth. In a group of 16 children, 9 - 12 month old, the average number of different ways in which a given type of communicative intent was realized was close to 1 (1.09). Only 3 of the 16 children had more than one form of realization for a given type of intent. Most of these realization were of the constant, unmarked kind; only 7 out of a total of 70 realizations produced by the whole group were of the selective, marked kind, verbalizing a specific element of the communicative intent by an expression that is appropriate for that particular instance only (Ninio, 1990). Even these few variable-type realizations were suspect of being some sort of performative vocal games rather than true selective verbalizations. It is obvious that children do not start off with the mapping skills necessary for patterned speech; they seem to operate with a "uniqueness principle", learning only a single way to verbalize a given type of intent; and they appear to conceptualize language as providing an unmarked, general signalling of their intents.

The emergence of multiword utterances thus requires the mastery of two further mapping principles before word-order can even be considered as a means of encoding meaning: that an intent may be mapped to speech in more than one way; and that intents may be expressed not only by conveying the general idea by an unmarked form, but also by mapping a selected component of the message to a specific, marked form that covaries with circumstances. Unless children master these principles, it is impossible for them to proceed to syntax. Neither principle is sufficient by itself to support multiword combinations: for instance, a child who has not grasped selective/variable mapping can neither produce pivot-type ("more + X"), nominal ("get ball"), or pronominal ("take + it") multiword utterances (Bloom, Lightbown, & Hood, 1975; Braine, 1976), as all these word combinations rely on at least one of the components in the sentence realizing a specific and variable element of the communicative intent. The hypothesis of this study is that the relevant mapping principles will be acquired prior to patterned speech, and that their acquisition paves they way for the emergence of syntax.

One-to-many mapping of intents and mapping to a variable rather than a constant expression are of course not unique to multiword speech but may be manifested in the production of single-word utterances as well. There is no logical reason why a child mastering these principles may not employ them at once both in single-word and multiple-word utterances. However, learning word order and simultaneous control of multiple elements in one utterance may be a heavy enough task by itself, and it is more reasonable to expect that the mastery of these mapping principles on the level of one-word speech would precede the emergence of syntax for some little while.

It was therefore hypothesized that the emergence of patterned speech is simultaneous with or preceded by two developments in children's ability to map communicative intents to single-word expressions, consisting of:

1. An increase in the use of multiple realization rules for the same intent;
2. An increase in the use of variable-type, selective realization rules.

Method

Sample

Sixteen Hebrew-speaking mother-infant dyads were observed and videotaped 6 times, in two-months intervals. Eight of the children were 12 month old at the first filming, and 14, 16, 18, 20 and 22 months at subsequent observations. Eight were filmed between 18 and 28 months. Two observations could not take place because of illness or the family's travel. In each subgroup, four of the infants were male, 4 female, two each of a middle-class and a lower-middle class background. The dyads were videotaped for 30 minutes at a time in unstructured interaction sessions in their homes. All children were of normal health, of intact homes, and first-born. The subjects were randomly selected from birth records and recruited through letters and home visits. Mothers were paid a fee for their participation.

Procedure

The mother-infant dyads were videotaped for 30 minutes at a time in unstructured interaction sessions in their homes. Mothers were asked to behave as they usually do at that time of the day, but were asked to stay as much as possible in the same room with the child. They were told that we wished to obtain a naturalistic sample of infants' interaction with their mothers, but were not told before the end of the study that either maternal or child language was to be the special focus of analysis.

Data analysis

All utterances were transcribed in standard orthography. The corpora were then divided into sentences (for the computation of MLU) and into utterances (for the sake of communicative coding). An utterance was defined as a stream of speech which has a sentence or clause intonation contour and which is separated by perceptible pauses from other locutions of the same speaker. Next, one-word utterances were identified. To minimize arbitrary decisions on what constitutes a word, a grammatical definition was adopted. This excluded from the one-word data base multiword stock expressions such as the Hebrew equivalent of "Good night". The only exception was a very early child utterance, et ze ("this" plus accusative), which was considered a one-word utterance as long as no other combinations with the accusative et were produced by the same child. Immediate repetitions of a single word within the same speaking turn were not taken as adding to the length of the utterance, nor were they considered independent single-word utterances.

Computing MLU and identifying the onset of patterned speech

MLU (mean length of utterance) was computed in number of words per sentence, on the basis of all the intelligible and communicatively meaningful sentences produced by a child at a given observational session.

Coding for communicative act

Single-word utterances were coded for the type of social-communicative act performed in uttering the utterance, using a detailed category system developed in the study (Ninio & Wheeler, 1984).

The category system classifies the verbal-communicative function of speech on two structural levels, on the level of a strip of talk called an interchange, and on the level of individual utterances. A talk interchange is a group of adjoining utterances that have a shared interactive meaning. The system has 65 categories of talk interchanges, according to their interactive significance. They fall into families of different modes of using speech: action negotiation, discussions, markings of events, performances of moves in game formats, clarification episodes, etc. The interchanges are further distinguished according to the type of interactive state or event they are related to: for instant, negotiations can be of entering into co-presence or of leaving, of getting into focussed interaction or of leaving it, of initiating joint action or ending it, of

performing single acts or of stopping acts in progress.

On the second level the communicative function of the single utterance is classified, within the relevant interchange. For instance, in a verbal exchange that comprises of a negotiation of the next activity, a certain utterance might suggest a specific new activity to be engaged in, while another utterance might serve to agree to carry out that suggestion or else might reject it. There are 64 categories of speech acts for individual utterances which are moves in interchanges.

In theory, every speech act appearing in the environment of every interchange defines a unique type of communicative act. In the present study, some of the detailed communicative act categories were combined on theoretical grounds, in cases where the speech act categorization was the sole defining characteristic of the communicative intent regardless of the interchange in which the act was emitted in. For instance, all affirmative answers to yes/no questions were grouped, regardless of whether the question was asked in an interchange proposing some activity or in an interchange discussing a past event, since such answers are to be understood solely in relation to the question asked, regardless of their wider discourse and interactive context. Second, no distinctions were made between utterances with falling and rising intonation, namely between statements and yes/no questions or between requests, requests for permission, and questions about hearer's wishes that also function as suggestions.

Table 1 presents some examples of communicative intents to be found in the corpora.

Insert Table 1 about here

Determination of the communicative intent underlying an utterance was done on the basis of the verbal and nonverbal interactive context of the utterance, as judged from the videotaped observations. As far as possible, this decision was made independently of what the speakers said. This means that contextual considerations overrode textual ones, so that if contextual clues indicate it, it was allowable to decide that a child was making an affirmative response even though what she said was "no", or the converse. Coding was aided by considerations of the participants' nonverbal behaviour, by further clarifications put on the utterance, and by the future course of the conversation.

All corpora were coded twice, by two different, highly trained, coders. Blind recoding of five, randomly chosen, corpora consisting of 415 child single-word utterances revealed an intercoder agreement of 83.6%. Subsequent to the reliability check, all disagreements were discussed and reconciled. Incomprehensible utterances or ones with no apparent communicative meaning were excluded from further analysis. The final data base consisted of 8573 coded single-word utterances.

Defining mapping rules

To aid further analysis, each type of communicative act was formally represented by a fully explicit performative sentence containing formal names for each major element of the message. Then, utterances were related to the intent assumed to have generated them in order to discover the principle by which the intent may be recoverable from what was said.

Mapping strategies

There were six types of mapping strategies employed by children in order to express communicative intents verbally. These are:

1. Realizing a communicative intent by a constant, routine expression regardless of possible variation in the specifics of the intent. Such realization rules occurred in three circumstances:

(a) A word was holistically mapped onto the message, such as "here" onto a

Marking of action completion, or "hello" onto the Performance of a move in a pretend telephoning-game; or else Exclamations expressing distress such as "ai" or "oh", etc;
(b) A word expressed a constant element of the message such as "more" in the expression of the communicative intent Speaker proposes that speaker (and/or addressee) repeat previous action, where the utterance encodes the element of continuation, but not the elements of speaker, addressee, the directive force, or the specific nature of the action. This component of the message is categorized as a fixed element as it remains the same whether the action is one of drinking, eating, being given Lego pieces to combine, or being tickled, and its expression is similarly constant across the different activities. Another example may be saying "no" as a Refusal or a Negative answer to a yes/no question;
(c) A word expressed a variable element of the communicative intent by a constant form, e.g., by proforms and prepositions. For example, the utterance of "this" in the expression of the communicative act Speaker suggests the initiation of a joint activity +/- focussed on an object, was considered a fixed proform. General diectic utterances such as "here", "there", "this", "that", etc. were always considered fixed expressions.

In the absence of reliable criteria on the rules children are following, no distinctions were made between cases where the mapping is intrinsically holistic, and cases where adults, at least, produce the fixed expression as the verbalization of a selected element of the message, whether a constant or variable element. These were all considered as produced by a rule that maps an intent to a constant expression, and at least potentially all such expressions may be produced by young children by a holistic mapping rule.

Examples of <u>constant</u> type mapping rules are presented in Table 2.

Insert Table 2 about here

<u>2. Realizing an intent by a variable expression that selectively expresses an element of the communicative intent that covaries with circumstances.</u> For instance, in the utterance of "ball!" expressing the communicative intent discussed above, namely Speaker suggests the initiation of a joint activity +/- focussed on an object, the element of object is being selected for encoding, and what is said changes with the specific object suggested as the focus of activity.

Examples of <u>variable</u>-type mapping rules are presented in Table 3.

Insert Table 3 about here

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3. <u>Realizing an intent by lexicalizing the element Addressee of the message by naming the addressee of the communication</u>. This strategy was considered an intermediate one between constant and variable mapping. On the one hand, the addressee of a speech act is a variable element of the communicative intent, varying according to whom the speaker addresses. On the other hand, the element of the addressee is <u>constant</u> across all different communicative intents. The verbalization of this element, common to all communicative intents, conveys no information on the kind of communicative intent expressed but is considered a nonspecific, fixed expression of the intent to communicate. Such mappings were used to express the communicative acts of Calling, Proposing turn for hearer, Proposing repetition of act, Proposing object to act on, Proposing an act on a given object, Proposing a new activity and the like, as well as Answering in the negative, Marking the transfer of an object, Performing a move in a telephone game, and more.

4. Realizing an intent by lexicalizing the element Speaker of the message by naming the speaker of the communication. This strategy was used for instance for realizing the communicative act of Demanding a turn for speaker. It was also considered an intermediate strategy between constant and variable mapping.
5. Realizing an intent by repeating or rephrasing all or part of a previous utterance. Such a communicative strategy was used some of the time for realizing Affirmative answers to yes/no questions, Agreeing with a proposition; Disagreeing with a proposition (if said in a questioning intonation); Agreeing to perform as requested, Pointing out the whereabouts of an object asked about, Acknowledging a communication, and, obviously, in spontaneous and elicited Imitation.
6. Realizing an intent by reciting a rote-learned text. Such a communicative strategy was used, for example, for realizing the communicative act of Recite text of songs or Complete incomplete text if so demanded.

Defining realization rules

For each single-word utterance, a realization rule was written that described how the communicative intent was mapped onto the utterance. For utterances mapped by constant-type realization rules, the rule consisted simply of the specification of the fixed expression to be employed. For utterances mapped by variable-type rules, the rule specified the element of the intent selected for verbalization , eg., the OBJECT, ACTION, or LOCATION element of the intent "Statement discussing a joint focus of attention". In case several categorical expression rules were in evidence, the summary realization rule also specified the type of expression used, eg., PROPER NAMES, COMMON NOUNS and PRONOUNS realizing the element of PERSON in the communicative act 'Answering a who-question' were considered generated by three different realization rules. Variable mapping was coded only if it was impossible to understand the utterance unless its relation to the intent was identified as a selective realization of some component. The default option in ambiguous cases was constant mapping.

Results

The onset of patterned speech

Table 4 presents the mean length of utterance for the children of the sample by age at observational session.

Insert Table 4 about here

The age of the onset of multiword speech was defined as the age at the first observational session when a child's MLU was 1.15 or more. Patterned speech emerged in the sample between 16 and 26 months, the mean age was 22.0 months (SD 2.4). Two children of the younger subsample did not reach criterion by 18 months (the last observation), and two of the older sample reached criterion at the first observation at 18 months.

The development of multiple realization rules

The use of multiple realization rules was measured by the number of "spare" realization rules used by a child in a given observational session, namely, the number of different mapping rules exceeding the number of different communicative intents expressed by them. The number of "spare" realization rules demonstrates the extent to which a child has acquired and is using mapping rules beyond the single rule that is absolutely necessary for some kind of verbal expression of a given intent. Table 5 presents the number of "spare" realization rules by child and age at observation.

Insert Table 5 about here

Examination of the age trends of the number of "spare rules" revealed

that multiple rule use was very rare in the youngest children, namely at 12 months, and stayed very low for another 4 months. During this period the average number of different communicative intents expressed by these children increased from 4.88 to 11.87 and 18.29, the overall number of mapping rules they used increased from 5.13 to 14.62 to 20.86, while the average number of "spare rules" only changed from 0.25 to 2.75 to 2.57 (see Ninio, 1990). At around 18-22 months, however, a sudden sharp increase occurred in the number of spare realization rules. Compared to previous rates of growth in multiple rule use, consisting of an addition of 0-3 "spare rules" per observational session, the increase observed at this observation was of the addition of 8.5 "spare rules" on the average. After the preceding low level, at this observation the number of spare rules used by the child stood on the average at 11.42 (SD 4.87). For comparison, at the preceding observation the mean was 2.92 (SD 2.11). At the same time, the percentage of "spare" rules out of all rules increased from 14.1% to 27.7% on the average, demonstrating that the increase in the number of spare rules was almost twice as steep than the baserate increase in the overall number of mapping rules the children were using.

Summarizing these findings, it seems that until about the middle of the second year, children tend, with very few exceptions, to use a single realization rule for expressing a given type of communicative intent. Then, around 18-22 months, there is an abrupt change in their tendency to use multiple mapping rules and the number of such rules and their proportion out of all rules the child uses, increases abruptly. The suddenness of this development suggests that the acquisition of multiple mapping rules is to an extent a discontinuous stage-like phenomenon.

The development of variable-type mapping rules

Table 6 presents the number of variable-type rules by child and by age at observation.

Insert Table 6 about here

Examination of the age trends of the use of variable mapping rules revealed that this phenomenon, too, is characterized by an abrupt increase following a relatively stable period in which very little use is made of this type of realization rule. This sudden increase in the number of variable rules occurred also around 18-22 months. Compared to previous rates of growth in variable rules, consisting of an addition of 1-4 rules per observational session, the sudden increase observed at the crucial observation was of the addition of 9 such rules on the average. At this observation the number of variable-type rules used by the child reached or passed the 10 mark, and stood on the average at 14.14 (SD 3.32). At the preceding observation the mean was 5.14 (SD 1.46). The increase in the use of variable rules was almost twice as large as the general increase in the overall number of mapping rules the child was using; the mean percentage of variable rules of all rules increased from 18.7% to 33.3%

The relation between the onset of patterned speech and pragmatic development

To test the hypothesis that the emergence of patterned speech is simultaneous with or else preceded by developments in children's mastery of the single-word communicative system, developmental trends in the use of multiple mapping rules and of variable-type mapping rules were related to the onset of patterned speech. It should be remembered that because of the two-months interval between observational sessions, simultaneous occurrences may actually mask a temporal precedence of one phenomenon over the other, within a month or two of each other.

Two children already produced multiword utterances when first observed at 18 months. In all the other 14 children, the onset of multiword speech

was simultaneous with or else was preceded by the sharp increase that occurred in the use of multiple mapping rules and also by the sharp increase that occurred in the use of variable-type mapping rules.

Of the two mapping spurts, the sharp increase in the use of multiple rules occurred first, and the increase in the use of variable-type rules was coincidental with it or else followed shortly after.

Jump in no. of multiple rules:	Mean 19.4 months (SD 2.7)
Jump in no. of variable-type mapping rules:	Mean 20.5 months (SD 2.7)
Onset of multiword speech:	Mean 22.0 months (SD 2.4)

Within individual children, the ordering of the three phenomena took the following form:

MULTIPLE RULES ≤ VARIABLE RULES ≤ PATTERNED SPEECH

In 12 of the 14 children, both mapping jumps preceded or were simultaneous with the onset of patterned speech. In 2 children, one mapping jump was simultaneous with the emergence of patterned speech, and one followed it. (Both preceded: 9. One preceded, one simultaneous: 1. Both simultaneous: 2. One simultaneous and one following: 2.)

In all 14 children, the jump in multiple rules preceded or was simultaneous with the onset of patterned speech. (Preceded: 10. Simultaneous: 4.)

In 12 of the 14 children, the jump in variable mapping rules preceded or was simultaneous with the onset of patterned speech. In 2 children only, this order was reversed. (Preceded: 9. Simultaneous: 3. Followed: 2.)

In all 14 children, the jump in multiple rules preceded or was simultaneous with the jump in variable type mapping rules. (Preceded: 6. Simultaneous: 8.)

To illustrate the pattern of results found, Figure 1 presents the age trends in the number of spare rules, in the number of variable-type rules, and in MLU, for one of the subjects. For this subject, the sharp increase in the two mapping skills and the onset of multiword speech occurred in the same observational period.

Insert Figure 1 about here

Lastly, in the two children who at the first observation at the age of 18 months already produced multiword speech, the number of spare rules and variable mapping rules of single-word speech at this observation was at a level characteristic of the post-increase period, namely, 8 and 16 spare rules and 12 and 15 variable rules, respectively. The proportion of spare rules and of variable type rules out of all rules also stood at a post-jump level (25.0%, 43.2%; 37.5%, 40.5%). At the very least, these results do not appear to reflect an ordering contrary to the expected for these two children, either.

Discussion

The results of this study indicate that, in most cases, children solve the intent-mapping problems inherent in the production of multiword utterances first on the level of single word speech, some time prior to actually starting to combine two or more words in the same utterance.

That this should be the case is not of a logical necessity. On the contrary, it is easy to draw an alternative scenario in which children's learning the syntactic principles of eg., a pivot-type combinatorial rule helps them master the pragmatic-semantic innovations involved. For instance, children could come to understand the principle of variable-type

mapping as a consequence of learning to operate with the variable element X of such combinations as "more + X". Such knowledge could then be transferred to single word speech, with the result that children would start to use many variable-type mapping rules to generate one word utterances some time after the onset of multiword speech. It is not even logically necessary that children transfer this novel mapping insight to single word speech; one-word utterances may retain the character of general nonspecific markers of communicative intent, even after multiword speech is acquired.

However, the results suggest that de facto children do not break into multiword speech before they work out the necessary pragmatic principles on the level of single word utterances. The innovations involved in the entry into multiword speech appear to be restricted to matters concerning the combination of several elements into a meaningful and lawfully regulated whole, whether on the formal level (eg., the mastery of a joint intonation contour or of word order) or the functional (eg., the mastery of pragmatic/semantic relations between the elements). Apparently, such combinatorial information is difficult to acquire unless a child already possesses a relatively sophisticated concept of what language is about.

Judging from their earliest productions, children at the beginning of language use view speech as a means of signalling some general communicative function (cf. Halliday, 1975). These unmarked forms are useful in a wide range of circumstances, and children tend to acquire only one of them for each type of function, either because they do not feel a need to learn a new form when the old one functions efficiently in most circumstances, or because they operate with a uniqueness principle that blocks the acquisition of more than one form of expression for a given type of social meaning. In any case, their speech is a collection of rather imprecise markers of assorted communicative intents, the relation between the expression and the social meaning signalled, vague and holistic. In some sense, early speech strongly resembles the preverbal, gestural communicative system, and can easily seen as a collection of useful vocal gestures.

The changes that occur in the middle of the second year in children's strategies of mapping intent to single-word utterances mark the end of this initial stage of language use. The vague signalling relationship between the verbal expression and the general idea communicated by it that characterized the speech of the first stage is complemented and in many cases superseded by a much more complex type of "language game", consisting of the flexible mapping of selected components of intents onto specific expressions. For the first time, there is evidence that children analyze their communicative intents into separate components, and that they internally represent their intents in terms of such components. Apparently, children cannot start to deal with the problems presented by multiword speech unless they have already passed from the first to the second stage of speech use. Conceptualizing language as a set of fixed forms holistically signalling the main drift of one's intents does not constitute an adequate foundation for the acquisition of syntax.

Thus, the shift to second phase of language use appears to mark a fundamental change in children's understanding of the structure of communicative intents and of the ways communicative intent may be mapped to expressions. The results raise the possibility that an understanding of the componential structure of communicative intents and of the ways selected components may be mapped to expressions, is a necessary antecedent to the acquisition of multiword speech. Grammatical and communicative developments appear indeed to be intimately tied in early child language.

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Table 1. Examples of types of communicative intents

Calling hearer to attend to speaker.
Greeting on meeting.
Request/propose the initiation of a new activity.
Request/propose the continuation of a new activity.
Request/propose the repetition of an action.
Propose object to act on; action known.
Propose an act on a known object.
Propose a location for a known act on a known object.
Agree to do as requested.
Refuse to do as requested.
Propose the ending of an activity.
Statement discussing a joint focus of attention.
Statement discussing a recent event.
Statement discussing a past or future event.
Agreeing with a proposition.
Disagreeing with a proposition.
Correcting an utterance.
Yes/no question requesting clarification of utterance.
Affirmative answer to yes/no questions.
Negative answer to yes/no questions.
Verbal move in telephone game.
Verbal move in peek-a-boo game.
Mark object transfer.
Mark completion of action.
Mark the falling of an object.
Exclaim in disapproval.
Exclaim in distress
Exclaim in surprise or enthusiasm

Table 2. Examples of constant-type mapping rules

Exclaim in distress --> say "oy", "vay", "oh".

Mark object transfer --> say "here", "this".

Perform verbal move in peek-a-boo game --> say "boo".

Answer in the affirmative --> say "yes", "OK", "ahem".

Greet on meeting --> say "hi".

Direct attention to a focus --> say "here", "this", "look".

Propose new activity --> say "this".

Statement discussing joint focus of attention --> say "here", "this", there".

Table 3: Examples of variable-type mapping rules

Propose new activity +/- focussed on object or person -->

verbalize object (eg. Lego, water, pacifier, ball);

OR verbalize activity (eg. walk, dance, build);

OR verbalize person to play with (eg. daddy, Johnnie).

Request object, action is known, eg, give, put, bring -->

verbalize object (eg. wheel, book, pencil).

Request for action, object is known --> verbalize action (eg. put, open).

Answer what-question --> satisfy wh-element (eg. flower, nose).

State intent to act --> verbalize object of action (eg. block);

OR verbalize location of action (eg. in-the-box).

Statement describing recent event --> verbalize event (eg. fell, broke).

Statement describing past event --> verbalize person involved (eg. grandma).

OR verbalize location involved (eg. train)

Statement describing joint focus of attention -->

OR verbalize entity at focus (eg. shoe, daddy);

OR verbalize action at focus (eg. eat);

OR verbalize attribute of entity at focus (eg. red, big);

OR verbalize state of entity at focus (eg. asleep);

OR verbalize number of entities at focus (eg. two);

OR verbalize location of entity at focus (eg. in-bed).

Table 4. Mean length of utterance (MLU) by child and age at observation

	Age at observation								
Child	12	14	16	18	20	22	24	26	28
1	1.00	1.00	1.00	1.05	1.00	1.04			
2	1.00	1.08	1.12	1.05	1.28*	1.45			
3	1.00	1.00	1.11	1.29*	--	1.37			
4	1.08	1.00	--	1.00	1.03	1.09			
5	1.00	1.02	1.00	1.04	1.36*	1.38			
6	1.00	1.03	1.03	1.00	1.18*	1.45			
7	1.09	1.00	1.02	1.00	1.00	1.40*			
8	1.00	1.06	1.06	1.11	1.19*	1.34			
9				1.00	1.03	1.29*	1.67	1.70	1.48
10				1.11	1.02	1.03	1.55*	1.43	1.91
11				1.00	1.00	1.02	1.13	1.44*	2.11
12				1.26*	1.17	1.55	2.00	2.02	1.84
13				1.33*	1.51	1.47	1.66	1.77	1.72
14				1.04	1.03	1.08	1.17*	1.80	2.50
15				1.08	1.10	1.06	1.54*	1.33	1.82
16				1.03	1.06	1.13	1.52*	2.17	2.68

* Onset of patterned speech; MLU = 1.15 or more .

Table 5. Number of spare realization rules by child and age at observation

	Age at observation								
Child	12	14	16	18	20	22	24	26	28
1	0	3	0	2	5	20			
2	0	3	2	9	13	12			
3	0	2	2	11	--	28			
4	0	4	--	9	10	22			
5	0	1	0	5	5	5			
6	0	2	3	4	16	6			
7	2	3	4	2	6	13			
8	0	7	7	17	13	14			
9				2	20	21	15	15	19
10				3	9	3	9	6	7
11				1	2	6	9	15	13
12			8	8	17	3	7	14	
13			16	5	9	7	5	4	
14			10	24	19	30	17	9	
15			0	3	1	9	15	12	
16			9	12	14	20	19	3	

Table 6. Number of Variable realization rules, by child and age at observation

	Age at observation								
Child	12	14	16	18	20	22	24	26	28
1	0	0	1	0	4	15			
2	1	3	4	15	15	17			
3	0	1	5	6	--	19			
4	1	4	--	11	12	16			
5	0	1	2	10	8	8			
6	1	3	3	6	17	20			
7	1	2	4	1	4	15			
8	3	5	10	15	13	16			
9				2	7	19	10	13	9
10				6	16	10	17	10	7
11				1	2	5	15	13	13
12				12	20	10	4	7	10
13				15	9	13	12	7	7
14				7	16	17	28	14	9
15				2	3	1	5	10	11
16				7	10	12	18	12	6

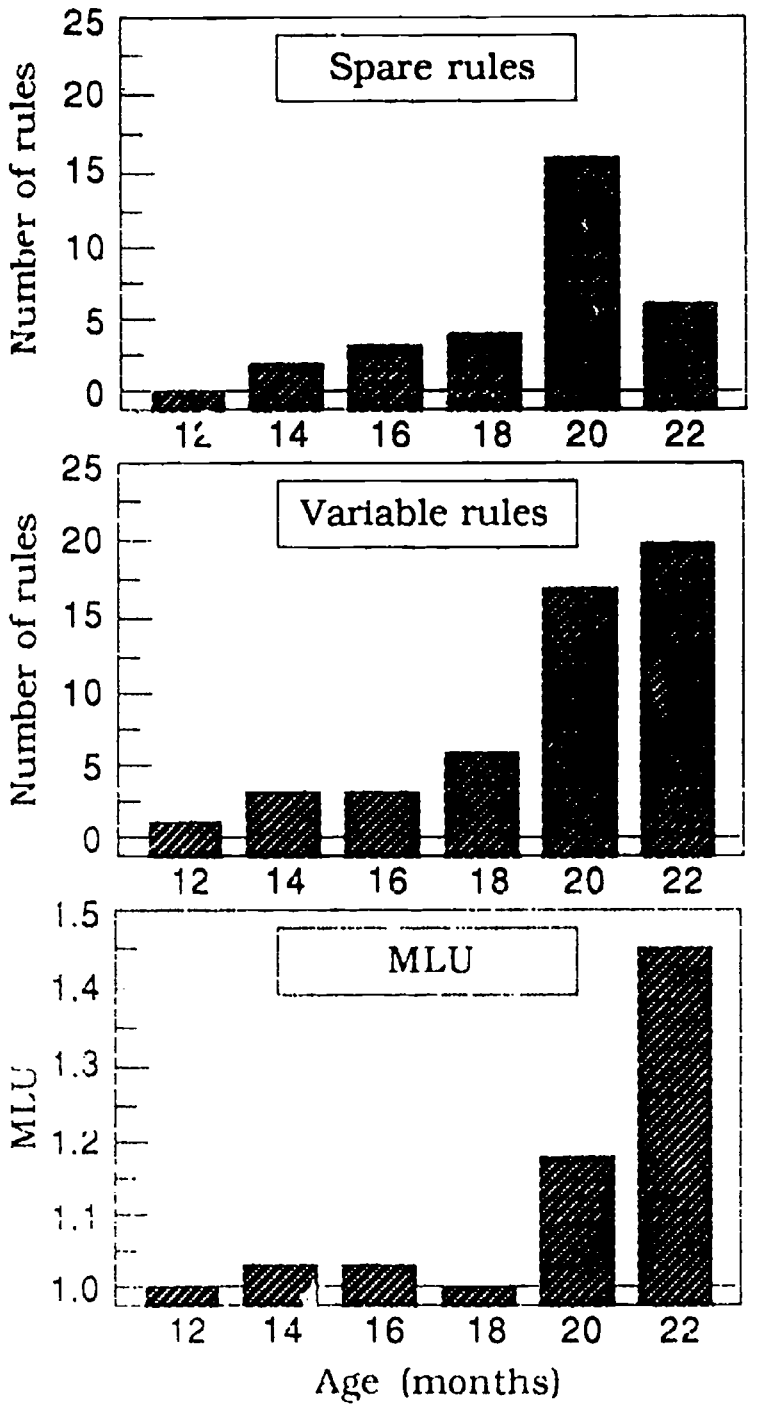

Figure 1: Age trends in the number of spare rules, in the number of variable-type rules, and in MLU, for one of the subjects.