

VERBAL MODELING BEHAVIOR
IN MOTHER-CHILD INTERACTION

by

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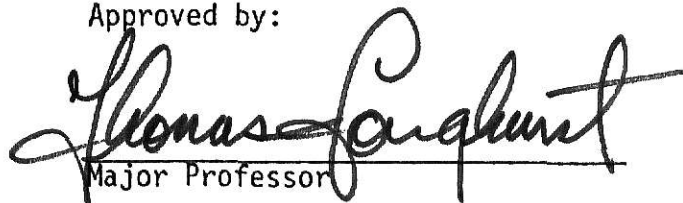
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**THIS BOOK
CONTAINS
NUMEROUS PAGES
WITH MULTIPLE
PENCIL AND/OR
PEN MARKS
THROUGHOUT THE
TEXT.**

**THIS IS THE BEST
IMAGE AVAILABLE.**

INTRODUCTION

The process of language development in preschool children has received a great deal of attention in recent years. This interest has resulted in attempts to provide a description of language development from two-word utterances to adult-like speech (Bloom, 1971; Brown & Frazer, 1964; C. Chomsky, 1969; Menyuk, 1964; Miller & Ervin, 1964).

Carroll (1961) expressed the belief that the quality of a child's early linguistic environment is the most important external factor affecting the rate of language development in the normal child. Primary to the language environment of the child is the interaction provided by adults (in particular the mother as a result of her more frequent contact with the child). Recent investigations (Broen, 1972; Phillips, 1970; Riedl, 1972; Snow, 1972, Stepanich, 1973) have examined the relationship between the language behavior of adults and the language status of children with whom they interacted.

Phillips (1970) used a paradigm that compared adults' language behavior in adult-adult dyads with their behavior in adult-child dyads. Adult-adult speech characteristically contained longer utterances, a greater proportion of function words, a smaller proportion of content words, and more verb forms than adult-child speech. Broen (1972) had mothers interact with an adult and then in another session interact with two of their own children, one older (4-6 years) and one younger (18-26 months). Results of the interactions demonstrated that mothers modified

their speech in ways that systematically related to the age of the speaking partner. Mothers used a slower speech rate and a more restricted vocabulary with the younger child than with the older child or the adult. In addition the mothers used more single word utterances and a greater number of imperative and interrogative sentences with younger children. Stepanich (1973) had mothers of one, two, and three-year-olds interact with their children and then interact with an adult. Results of her investigation revealed that as the children's ages increased, mothers not only altered their speech in the ways discussed by Phillips and Broen but they also altered the type of questioning behavior used. With older children, mothers used significantly fewer questions requiring information from the child. Snow (1972) examined the mean length of utterances used by mothers while interacting with their own two and ten-year-old children. She found that the mother's mean length of utterance increased in accordance with an increase in the chronological age of the child. The descriptions of the language simplifications discussed by Phillips, Broen, Riedl, Snow and Stepanich describe some adult language behaviors used by adults when interacting with children of various linguistic ability. These investigators have developed measures which have been specifically designed to examine the interactions between the verbal behavior of adults and children.

(Brown and Bellugi (1964) in a longitudinal examination of adult-child language interactions involving a 27-month-old male, Adam, and an 18-month-old female, Eve, described two interaction behaviors. One of the behaviors they observed was named imitation with expansion. In

this interaction, adults imitated utterances produced by children while maintaining the same word order as the child's utterance but including appropriate functors left out by the child. For example a child would say "Horsey there" to which the adult would reply "The horsey is there". Brown and Bellugi reported that expansions account for approximately 30% of an adult's utterances addressed to a child. More recent reports indicated that the rate might actually be as high as 51% for some adults (Brown, 1970). Brown (1970) reported longitudinal data on Sarah, a 27-month-old female. Sarah, like Adam and Eve was studied in her home under similar experimental conditions. Sarah's father was a store clerk while the fathers of Adam and Eve were Harvard graduate students. Brown reported that Sarah's mother expanded 29% of the time while the mothers of Adam and Eve expanded at much higher rates of 51% and 45% respectively.

A second language behavior observed by Brown and Bellugi (1964) was a child modeling behavior. This interaction was named imitation with reduction, referred to as reduction or imitation. The children imitated the sentences of adults while maintaining the same word order as the adults sentence but excluding functors. No frequency of occurrence was cited for this behavior although McNeill (1970) suggested that children imitate about 10% of the time. McNeill hypothesized that imitation with reduction is an effort of the child to match the adult's surface structure with his own surface structure.

Although Brown and Bellugi (1964) opened doors for further research into the psycholinguistic aspects of adult-child language interactions, the results which were obtained are open to considerable question in

light of the experimental paradigm used. The size of the sample was extremely small (three children) and the subjects were chosen on the basis of their exceptionally high levels of intelligibility and talkativeness (Brown & Bellugi, 1964). Consequently, the sample chosen represented the cream of the crop from a linguistic standpoint.

A second adult initiated language behavior called modeling was described by Bandura and McDonald (1963). As with expansion, the adult's model followed an initial sentence of a child. The adult's model, however, added referential information to the child's utterance and it did not have to retain any words from the child's utterance.

Muma (1971) discussed two types of naturalistic modeling behavior. One behavior called simple expatiation appears to be the same behavior described by Bandura and Harris (1966). The second behavior Muma called complex expatiation and it differed from simple expatiation in that the contingent utterance of the adult was a compound or complex sentence rather than a simple sentence.

Several language intervention techniques investigated by Blank and Solomon (1968) resemble a modified form of modeling. Specifically, techniques named "cause and effects reasoning" and "sustained sequential thinking" appear to involve the use of a model plus interrogation construction (Muma, 1971, p. 7).

In spite of the interest in these interaction behaviors, experimental investigations of the behaviors remains sparse. Brown and Bellugi (1964) provided descriptive data on the occurrence of expansions. There are no descriptive data on the natural occurrence of simple or complex expatiation.

Additionally there is no frequency of occurrence data in the literature regarding imitation with reduction. Brown and Bellugi (1964) speculate that expansions could be viewed as a communication check on the part of the adult or as a language teaching device. Brown (1970, p. 76) has said that expansions "...seem so ideally devised to teach that it is hard to believe they do not do so...". Menyuk (1964) suggested that expansions may be useful tools in teaching syntax. Cazden (1965) and Muma (1971) indicated that expatiation (modeling) may be a useful strategy for enriching a child's semantic abilities.

Two investigations (Cazden, 1965; Feldman and Rodgen, 1970) have examined the value of expansion and expatiation as language intervention devices. Cazden (1965) compared the use of these two behaviors as teaching strategies for children who typically received minimal language stimulation. Thirty-six Negro children were randomly divided into three equal groups of twelve. One group received continuous expansions (every utterance of the child was expanded). The second group received continuous modeling while a final group received no treatment and served as a control. Results of the study were inconclusive as there were no overall significant differences between any of the treatments. McNeill (1970) expressed doubts as to the validity of Cazden's findings and suggested that the results were contaminated by the fact that, depending on the treatment, every utterance of the child was expanded or modeled. In this type of continuous expansion he argued that 100% of the child's utterances could not possibly be intelligible enough to be appropriately expanded or modeled. Feldman and Rodgen (1970) attempted to solve the problem. They divided

24 lower and lower middle class children into three experimental groups receiving treatments of 100% expansions, contingent expansions (only those utterances which were clearly understood by the adult were expanded), and expatiation (modeling). McNeill (1970) reported, on the basis of preliminary findings, that contingent expansions were the most effective treatment and that both contingent and 100% expansions were more effective than modeling. After a thorough analysis of the data, Feldman and Rodgen (1970) reported that contrary to McNeill's theory, none of the conditions yielded significant improvement in children's language ability. At present, the usefulness of expansions and modeling as language teaching strategies are open to question.

Currently there are insufficient data available to describe adequately the natural occurrence of expansion and expatiation in adults and imitation behavior in children. It was the purpose of the current investigation to describe the communicative behaviors employed in a mother-child verbal interaction. Specifically the current investigation attempted to answer the following questions.

1. To what extent do mothers use expansion, and expatiation with their young language learning children?
2. Is the frequency of occurrence of these behaviors dependent upon the chronological age of the child?
3. To what extent does the young language learning child utilize imitations when with their mothers?
4. Is the frequency of occurrence of these behaviors dependent upon the chronological age of the child?

Hopefully, the answers to these questions will help to further uncover the role of several observed communicative behaviors in the development of language in preschool children.

METHOD

Subjects

Twenty-four children, 12 males and 12 females, and their mothers served as subjects. All subjects were from middle socioeconomic families and were native English speakers. Twelve children were 23 to 25 months of age and 12 were 35 to 37 months of age. These age groups were chosen for study because they represented two distinct levels of language development in children. Additionally, differential age groupings have, in the past, been used to demonstrate mother-based language alterations in their mean length of response, speech rate, vocabulary, single word utterances, and usage of imperatives and interrogatives (Broen, 1972). No attempt was made to control for sex of the children, the educational backgrounds of the mothers, the ages of the mothers, nor the ages and number of siblings.

All children were judged to be normal or slightly advanced in their language development before they were included in the study. Developmental language level was determined by performance on the Receptive-Expressive Emergent Language Inventory (Bzoch & League, 1971) and through a short interview with the mother in which she was encouraged to discuss the progress of her child's language acquisition.

Because this inventory extends only to the 36-month level, the experimenter was unable to determine the exact language levels of the three-year-olds. However, through the items on the scale and through the interview with the mother, it was found that all of the three-year-olds were at least at the 36-month level or above on the inventory.

Experimental Facility

All sessions were conducted in a small, quiet room containing a microphone, a table, and two chairs. The experimenter monitored and observed the sessions through a one-way mirror in an adjoining room which contained a high fidelity tape recorder (Ampex, PR-10).

Procedure

Prior to the session each mother was told that she and her child were participating in a study of language development in children. She was also told that the experimenter was interested in observing and recording the verbal interaction between herself and her child. The experimenter assured the mothers that each tape would be coded to insure that neither her name nor the name of her child would be associated with the data. The specific details and purposes of the study were not disclosed to the mothers in order that they might perform as naturally as possible during the sessions.

Each mother participated in one session of approximately 10 minutes in length. During the session each mother interacted with her own child.

Experimental Condition

Immediately prior to the session, the mother was given a bag con-

taining several farm animals made by Fischer-Price, Inc. and 10 colored blocks. She was then instructed to play with her child just as she would in a similar play situation at home. The experimenter also asked the mother to continue to play with her child until the experimenter indicated that it was time to stop. The purpose of this task was to try and replicate a situation that might occur between a mother and child in the home.

Protocol Preparation and Segmentation

A typist typed verbatim transcripts of the speech of both mothers and children from the tape-recorded sessions following modified instructions as outlined by Siegel (1963)(See appendix A). The experimenter segmented the transcription into sentences using procedures described by Miner (1969). The protocol was segmented according to "thought unit sentences" rather than the traditional "per breath utterances". According to Miner (1969) sentences need not be complete and may occasionally extend across a pause (e.g., See the big black dog (pause) run and hide). Using "thought unit" segmentation this example would be one sentence while if the traditional "per breath utterance" segmentation were used this example would consist of two utterances. The sentence was chosen for analysis because the interaction behaviors under investigation often were not self contained within "per breath unit" segmented utterances. Thus the sentence offered a more viable unit of measurement as it consistently contained complete individual behaviors suitable for categorization.

Reliability for protocol preparation and segmentation was established by having an experienced assistant retype and resegment two entire

protocols and compute the percentage of agreement. Reliability for protocol preparation was 91% and 96% and for segmentation 88% and 91%.

Performance Measures

After protocol preparation and segmentation was completed, the experimenter categorized the sentences used by the mother into five predetermined categories. The children's sentences were categorized into three categories. Examples of these categories are presented in Table 1. A miscellaneous category was used for sentences that could not be categorized. This category was not subjected to any analysis. All of the categories had been previously described. Muma's (1971) descriptions of simple and complex expatiation as well as modeled questions formed the basis for the definitions used in the current investigation. Brown and Bellugi (1964) provided descriptions of imitation with expansion and imitation with reduction. An individual category for direct imitation by mother and by child was included since many language intervention programs suggest the use of imitations to teach lower level communicative skills (Baer, Peterson, & Sherman, 1967; Blank & Solomon, 1968; Brigham & Sherman, 1968; Lovaas, 1967). Questions asked by the child were included because of speculation by Blank and Solomon (1968). They suggested that question asking is a requisite to the acquisition of higher level linguistic skill dealing with abstraction.

Mothers' Verbal Behavior

Mothers' sentences were categorized as an expansion if it was a sentence of a mother which (a) immediately followed and was in response to

Table 1
Examples of Categories of Mother and Child
Interaction Behaviors

Mother Behavior	Child	Mother
Expansion	Horsey there	The horsey is there
Simple Expatiation	Horsey there	He's black
Complex Expatiation	Horsey there	He has a black nose and is fat
Modeled Question	Horsey there	How does a horse run so fast?
Direct Imitation	Horsey there	Horsey there
Child Behavior	Mother	Child
Reduction	A Horsey is fat	Horsey fat
Question	---	How old horsey?
Direct Imitation	Horsey	Horsey

the sentence of her child and (b) retained the same word order as the child's sentence and (c) contained the same content words but a greater number of functors thus adding syntactic information.

A sentence was categorized as simple expatiation if it was a mother's verbal behavior which (a) immediately followed and was in response to the sentence of her child, and (b) was a simple sentence, and (c) added referential information to the child's sentence. An expatiation did not have to retain the same word order nor any of the words contained in the child's sentence. It may or may not have contained a greater number of lexical items than the child's sentence.

The sentence of a mother was categorized as a complex expatiation if it met criteria (a) and (c) for simple expatiation and it was either a compound, complex, or compound-complex sentence.

The categorization of a sentence as a modeled question was made if the sentence met the combined criteria for expansion or expatiation and question. A question was defined as a sentence which (a) began with a wh-word such as what, where, which, who, when or how and was followed by an auxillary or modal and (b) ended in a rising inflection of (c) contained either (a) or (b) within a sentence.

Mothers' sentences were categorized as direct imitations if they were sentences that immediately followed and were in response to the sentence of the child and (a) retained the same word order and (b) contained the same lexical items as the child's utterance.

Children's Verbal Behavior

Sentences were categorized as reductions if they were the utterance of the child which immediately followed and was in response to the sentence of the mother. In the case of reductions, the child's sentence must have (a) retained the same word order and (b) contained fewer function words than the mother's sentence.

A sentence was categorized as a question if it (a) began with a wh-word (b) ended in a rising inflection or (c) contained either (a) or (b) within a sentence.

A sentence was categorized as a direct imitation if it was a sentence of a child which immediately followed and was in response to the sentence of the mother and (a) retained the same word order and (b) contained the same lexical items as the mother's sentence.

RESULTS

The data were analyzed in a series of one-way analysis of variance tests (Snedecor & Cochran, 1972, p. 258) at the .05 level of significance. Each analysis of variance compared the two-year-old group mean percentage with the three-year-old group mean percentage in each category.

The mean number of sentences uttered by the mothers of two-year-olds was 82, while the mean number of sentences uttered by mothers of three-year-old children was 87. These means were not significantly different.

The mean number of sentences uttered by the two-year-old children was 40 while the mean number of sentences uttered by three-year-old children was 67. There was a significant difference between these means ($F = 9.05$, $df = 1/23$, $p < .006$).

The percentage of occurrence of each category for the two groups is presented in Table 2. There were significant differences between the two groups of mothers for complex expatiation ($F = 4.85$, $df = 1/23$, $p < .038$) and modeled questions ($F = 6.58$, $df = 1.23$, $p < .017$). Mothers of two-year-olds produced a greater percentage of simple expatiations than mothers of three-year-old children although this difference failed to reach significance at the .05 level ($F = 3.93$, $df = 1/23$, $p < .059$). Differences between the two groups of mothers for expansion and direct imitation categories also failed to reach statistical significance.

A significant difference ($F = 10.19$, $df = 1/23$, $p < .004$) between the mean number of reductions for the two groups of children was found. Two-year-old children used a greater percentage of reductions than did the three-year-olds. The group differences for the question and direct imitation categories for children failed to reach statistical significance.

DISCUSSION

As in previous studies (Brown, 1972; Phillips, 1970; Snow, 1972; Riedl, 1972; Stepanich, 1973), the current investigation revealed that mothers' language behavior changed as the age of the child in the interaction changed. Unique to this study was that verbal interaction behaviors rather than traditional language behaviors were the basis for this conclusion. Additionally, the current investigation revealed previously unknown descriptive information regarding verbal interaction behaviors.

Unlike traditional language measures, the probability of occurrence of interaction behaviors between the mother and the child may be viewed

Table 2
 Percentage of Occurrence of Each Category
 for the Two Groups of Mothers and Children

	Percentage of occurrence	
	Two-year-old	Three-year-old
Mother Behavior		
Expansion	4.3	3.0
Simple Expatiation	9.4	5.9
*Complex Expatiation	7.1	13.1
*Modeled Question	10.4	20.4
Direct Imitation	5.3	6.8
Child Behavior		
*Reduction	21.4	4.9
Question	3.6	13.2
Direct Imitation	3.6	3.2

* $p < .05$

as a contingent relationship. Without a child's initial utterance, a response of expansion or an expatiation on the part of the mother is impossible. Likewise without a mother's initial utterance, a child's imitation with reduction cannot occur. Few previous investigations have concerned themselves with this contingent relationship. Inherent in this contingent relationship, however, is a difficult procedural problem. Since verbal interaction behaviors are contingent upon a previous utterance of the other member of the communication dyad, the probability for occurrence of an interaction behavior by the mother decreases proportionately with a decrease in total output by her child. For children's interaction behaviors this problem did not exist since mothers of both two and three-year-olds produced approximately the same number of total utterances. The total verbal output on the part of the children, on the other hand, increased significantly with age. We attempted to control for this problem by using percentage scores which provided a means of adjusting for the differences in total output. Since the output of two and three-year-olds was significantly different, we might have expected to see evidence of this difference in the mothers' total output. Stepanich (1973) observed that when a young child produces little verbal output, the mother will assume both roles of the verbal interaction. This activity was observed in the current investigation as mothers would typically model their own sentences rather than remain silent.

Mother Behavior

Of the specific verbal interaction behaviors examined the limited occurrence of expansions on the part of mothers was unexpected. Previous

investigations (Brown, 1970; Brown & Bellugi, 1964) have reported that expansions account for about 30% of adult utterances addressed to children. The present study found a substantially lower frequency of occurrence. Expansions accounted for 3% to 4% of the mothers' utterances addressed to their children. There are several possible explanations for these obtained differences. Brown and Bellugi may have included behaviors as expansions that the current experimenter classified as types of expatiation. This explanation is somewhat unlikely, however, since the definitions used by Brown and Bellugi (1964) were the basis for the definitions used in the current investigation. A second explanation is that previous investigations were sampling a dissimilar population than was being examined in the current study. Subjects in the present study were picked as being average in both receptive and expressive language skills while subjects for Brown and Bellugi's (1964) study were chosen on the basis of exceptional talkativeness and intelligibility. Additionally, Brown's (1970) findings were based on a small sample size (3 children). A final explanation is that Brown and Bellugi collected data in the home while data for the current investigation was collected in a laboratory environment. A more naturalistic and comprehensive procedure for use in future investigation of interaction behaviors in adult-child dyads might involve a combination of the behavior measures and subject selection procedures of the current study and the data collection techniques used by Brown and Bellugi.

Many have expressed the belief that expansions might serve as a teaching device (Brown & Bellugi, 1964; Cazden, 1965; McNeill, 1970;

Menyuk, 1964). If expansions play a role in the child's language development one might expect to see that the usage of expansions by mothers would be dependent upon the language age of the child. The assumption is that as a child's surface constructions grow more and more complex, there would be a proportionate decrease in the need for the mother's additions and corrections. The results of the current investigation indicated that mothers' use of expansion was not related to the age of the child. On the basis of these results, any conclusions drawn about the use of expansions as a teaching device would be premature. An investigation utilizing the same procedure with the exception of a substitution of language delayed and children with normal language of the same chronological age as treatments could contribute information regarding the role of language interaction behaviors in normal versus abnormal language development.

Another interaction behavior examined was the occurrence of complex expatiations. No previous descriptive information was available on the occurrence of this behavior in adult-child dyads. Results suggested that this interaction behavior was far more prevalent than expansions in the speech of mothers of both two and three-year-olds. Additionally, this behavior occurred more frequently in the speech of mothers of three-year-olds than in that of mothers of two-year-olds. This substantiated Broen's (1972) finding that mothers of older children use more complex expressive language constructions when interacting with their child. She suggested this tendency on the part of the mother to use more complex syntactic constructions correlated with the child's increasing ability

to decode more complex grammatical constructions.

It is interesting to note that although the results obtained did not meet the .05 level of significance, there was an inverse relationship between the occurrence of simple expatiations and the occurrence of complex expatiations. Mothers of three-year-olds used nearly twice as many complex expatiations as did mothers of two-year-olds. Inversely, mothers of two-year-olds used simple expatiations nearly twice as often as mothers of three-year-olds. Both groups of mothers used more expatiations than expansions.

Broen (1972) observed that the use of questions by mothers in mother-child dyads was related to the age of the child participating in the interaction. Leach (1973) suggested that expansions frequently co-occur with questions although no description of the occurrence of this behavior was reported. Results of the current investigation substantiate Leach's observation to the extent that it was found that modeling behaviors do frequently co-occur with questions. Broen's observation was substantiated as mothers of three-year-old children produced nearly twice as many modeled questions as mothers of two-year-olds. Future investigations of interaction behavior should consider a more thorough analysis of the role of questions in modeling behavior. By dividing the category of modeled questions into types of modeled questions (question + expansion, question + simple expatiation, question + complex expatiation) interaction patterns previously undetected may be observed.

The final category which consisted of direct imitation revealed no significant differences between groups. Mothers of two and three-year-olds

used approximately the same percentages of direct imitation.

Additionally, both groups of mothers used slightly more direct imitations than expansions. Brown and Bellugi (1964) and Brown (1970) emphasized the value of expansions in mother-child communication, however, little emphasis has been placed on the importance of direct imitations as an interaction behavior.

Child Behavior

Brown and Bellugi (1964) reported that imitation with reduction was a behavior used frequently by children. Results of the present study indicated that reductions are a frequently occurring behavior in two-year-olds and an infrequently occurring behavior in three-year-olds. These significant differences between groups suggest that imitation with reduction is age correlated. This suggests that as the child's syntactic ability increases the use of imitation with reduction decreases. While imitation with reduction was the predominant interaction behavior exhibited by two-year-olds, questions were the most frequently occurring interaction behavior of three-year-old children. Although the difference did not reach statistical significance, three-year-olds produced over three times as many questions as two-year-olds. This suggests that whereas two-year-olds are dependent in the interaction, three-year-olds begin to assert their independence through questioning behavior and actually initiating interaction.

The least frequently occurring verbal interaction behavior for both groups of children was direct imitation. It was somewhat surprising to note that adults used more direct imitations than their children. This

result is most easily explained as a function of the role of direct imitation as a form of communication check. The assumption is that a child is less apt to use a communication check since his interactions involve a greater degree of egocentric behavior.

The results of the current study provide an alternative method for analyzing variables which cannot be observed through the use of traditional linguistic measures. Hopefully, the application of interaction measures such as those presented here will aid in providing a more comprehensive description of the influence that children and adults have on each others language.

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APPENDIX A

Instructions for Typing Protocols

1. Type only the mother's speech for both the adult-adult interaction and for the adult-child interaction.
2. Do not use capitals (except for proper names or for the pronoun 'I'), commas, question marks, or any other form of punctuation in preparing the transcripts. You will use apostrophes, however, to indicate contractions or possession.
3. Some of the remarks made by the mothers may be completely or partially incomprehensible. If an utterance is either partially or completely incomprehensible, so indicate by typing several dots in the space where the utterance would be located.
4. Interjections such as 'uh' or 'er' should be omitted except when they are used as meaningful words.
5. Include unfinished words only if you are sure what they were meant to be.
6. Type numbers uttered by the speakers as if they were written out.
7. Include repeated words in the transcript.

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B.S., Kansas State University, 1973

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Department of Speech

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ABSTRACT

The current investigation examined an alternative method of examining the verbal interaction of mothers and their children in mother-child dyads.

Twenty-four children and their mothers served as subjects for the experiment. Twelve children were within one month of their second birthday while the other twelve children were within one month of their third birthday. Each child scored at the normal level or above on a receptive and expressive language inventory.

The experimental design consisted of one ten minute session. During the session each mother was assembled with her child. An assortment of toys was provided to the mother. She was instructed to interact with her child just as she might at home. Tape recordings were made of each session. An experienced typist prepared the protocols for analysis.

Analysis of the mother-child dyadic data revealed that the two groups of mothers' verbal interactions differed significantly. As the children's ages increased, mothers used more complex expatiations and modeled interrogations. The occurrence of expansions and direct imitations was not a function of age of the child. The verbal interactions of two and three-year-olds was significantly different as two-year-olds produced a greater percentage of imitations with reductions.