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thesis entitled

EXPRESSIVE AND REFERENTIAL COMMUNICATION
IN CHILDREN'S EARLY LANGUAGE DEVELOPMENT
THE RELATIONSHIP TO MOTHERS' COMMUNICATIVE STYLES

presented by

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has been accepted towards fulfillment
of the requirements for

Ph.D. degree in Psychology

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Date 5/20/80

EXPRESSIVE AND REFERENTIAL COMMUNICATION IN CHILDREN'S EARLY LANGUAGE DEVELOPMENT: THE RELATIONSHIP TO MOTHERS' COMMUNICATIVE STYLES

By

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A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Psychology

1980

ABSTRACT

EXPRESSIVE AND REFERENTIAL COMMUNICATION
IN CHILDREN'S EARLY LANGUAGE DEVELOPMENT:
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This study investigated the relationship between mothers' communicative styles and children's early language acquisition strategies, particularly with regard to early lexical development and language function. The subjects of the study included 19 mother-child pairs. The children were all only children from English-speaking, intact families, where the mother was unemployed outside the home. These children were followed longitudinally from their earliest vocabulary acquisition, through the first five word-combinations. Daily language diaries were kept by the mothers, and bi-weekly home visits were made by the investigator. When each child had acquired approximately 30 words, a voice-actuated recording system was placed in the home for two days.

The data collected for this study were of two types. First, the first 50 words acquired by each child were recorded and analyzed as to form and function of each word. Second, the tape recorded material obtained via the two-day audio recordings was inventoried and catalogued according to key activities and interactions, e.g., mother-child play, caretaking activities, father-child interaction, meal times, etc.

On the basis of the number of "general nominals" in the child's first 50 words, each child was categorized as having a predominantly

"expressive" or "referential" style of language acquisition. Several differences were found between the two groups of children. Referential childrens vocabularies consisted mostly of names for things. Expressive children's vocabularies contained relatively more personal-social expressions, and a greater variety of word categories.

Language function also differed significantly for the two groups. While referential children used language primarily to label or comment on their environment, expressive children were more likely than referential children to use language to control their environment and to get attention.

Mother-child interaction styles were compared for mothers of expressive and mothers of referential children. Two mother-child interaction contexts (Breakfast and Play) were selected from the second day of taping for each of the ten children. A total of 22 measures were obtained from the verbatim transcripts of the mothers' child-directed utterances in the two situations. The design consisted of two independent factors: Group (referential and expressive) and Situation (breakfast and play) with a repeated measure of the situation factor.

Several differences between the two groups of mothers were found. Referential group mothers used more nouns, more object references, more imitations, more yes/no questions, and fewer commands and prohibitions, than did expressive group mothers. Mothers of referential children also played more frequently with their children than did

mothers of expressive children. A positive correlation was found between education level of parents and degree of referentiality in children.

To Marv and Erin

ACKNOWLEDGMENTS

A very special acknowledgment must be given to Professor Helen Benedict, without whose support and positive reinforcement I would never have completed this degree. In addition to her encouragement and support, her thorough and critical evaluation of my work always provided the direction I needed to keep moving forward.

I also wish to acknowledge the members of my committee, for their input and support: Professor William Crano for his statistical consultation; Professor Hiram Fitzgerald for guidance through my graduate program and for providing me with a basic understanding of child development; Professor Julia Falk whose teaching inspired my interest in child language acquisition, and whose critical feedback on my research was timely and invaluable.

Special appreciation is extended to the parents of the children who served as subjects for this research. Their cooperation and enthusiastic participation made this study possible.

Finally, a very sincere expression of gratitude must be extended to Erin and Marv: Erin, who was my inspiration, and Marv, whose continued support, and sharing of the responsibilities of parenthood, enabled me to do this research.

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INTRODUCTION

Background

During the 1960's, research in the area of child language was directed primarily toward the discovery of linguistic universals, or characteristics of language development which were common to all children. Even those researchers who were not tied to the Chomskian notion of innateness were guided by the search for commonalities as they described the language of young children (e.g., Brown, 1973). These early descriptive studies produced different characterizations of the nature of early language development, for example, Braine's "pivot-open grammar" (Braine, 1963), and Brown's "telegraphic speech" (Brown and Fraser, 1963).

There was little consensus during this early period regarding the characteristics of child language development. This lack of consensus was not surprising in light of the very small samples used. Recent studies by Bloom (Bloom, 1970; Bloom, Hood and Lightbown, 1974; Bloom, Lightbown and Hood, 1975) and Nelson (1973) have suggested that there is not one universal formula which characterizes all language development. Rather, there are important differences among individual children which do not simply reflect population variance, but which may result from different "language acquisition strategies" (Bloom, Lightbown and Hood, 1975) or "cognitive styles" (Nelson, 1973). During

the early years of language acquisition research, the use of small samples, together with the strong theoretical biases of innateness and universality, would have masked such differences in patterns of acquisition.

Nelson (1971, 1973), who investigated 18 children longitudinally from one to two years of age, concluded that there were two styles of early vocabulary development which she labeled "expressive" and referential." The early language of referential children was characterized by a greater proportion of "general nominals," or words which labeled object classes (e.g. "dog," "book"), while the early vocabulary of expressive children was characterized by a greater variety of word types, and significantly greater use of stereotyped social expressions (e.g. "thank you") and function words (e.g. "where"). Also, expressive children were more likely to produce phrases earlier, and used a greater proportion of pronouns. Thus, while the typical referential child's vocabulary consisted primarily of names of objects, the expressive child's vocabulary was more apt to include a greater proportion of such utterances as "night night", "thank you," "mine," "oh oh", etc. In terms of differences in cognitive schemata, Nelson's findings suggest that the referential child is very object-oriented, while the expressive child seems more aware of his/her own "actions and affectivity."

Lois Bloom's work has also revealed different patterns of language acquisition. Bloom's 1970 study of the syntactic development of three young children did much to refute notions about universal structure in beginning word combinations which had been suggested earlier (e.g. McNeill, 1970). Bloom studied three children

longitudinally. Her study suggested that, while there were certain consistent similarities among all three children, they seemed to differ in their acquisition strategies for certain aspects of linguistic development. Subsequent work by Bloom has investigated these differences in more detail. Bloom et al. (1974) considered the role of imitation in language acquisition and found that children could be categorized as imitators or non-imitators, and that children who did imitate were clearly using imitation as a language acquisition strategy. In another study (Bloom et al., 1975) Bloom examined differences in patterns of structures in the emerging grammar of four young children. While she found a general pattern among the four children in the development of verb relations categories (verb relations being the primary focus of the study), she also found that children used very different linguistic systems for representing essentially the same information. According to Bloom, there appeared to be two mutually exclusive systems of semantic-syntactic structure. Two of the children had grammatical systems characterized by a predominance of nominal forms, and few pronouns or function words, while the other two children used more verb forms together with constant functional forms such as "I," "it," "there," "my," etc. The similarities between these findings and Nelson's expressive and referential communicative styles are striking. It should be noted, however, that the two authors differ in the following way: Bloom suggests that, while children use different features of the linguistic code in the development of their systems of semantic-syntactic structures, they all talk about the same things. Nelson, on the other hand, implies that the early linguistic differences among children result from different ways of

conceptualizing the world and do reflect differences in what children choose to talk about.

Other authors, who were not primarily concerned with individual differences, have, nevertheless, reported differences which seem to reflect the expressive-referential distinction. Dore (1974), in describing the early pragmatics of two young children, referred to one child as "code oriented," and the other as "message oriented." The "code oriented" child talked primarily about the _things_ in his environment, while the "message oriented" child used language to manipulate people. Vander Geest (1977), who studied Dutch mother-child language interaction, commented that two of the children in this study showed differences very similar to those reported by Nelson. Lieven (1978) also described striking differences in the language development of two children. While one child was, in Nelson's terms, highly referential, the other child rarely referred to the immediate context, and used language more to gain attention and express needs. Lieven goes on to discuss the possible effects of these different styles upon the mother's interaction with her child.

Bowerman (1976) considers the early language development of her own two children as well as the early diary information on Leopold's Hildegaard and Bloom's Allison. Bowerman points out differences in object word stability among these children and acknowledges that certain children emphasize function words while others use mostly object words. She goes on to suggest that it is unclear whether this difference reflects differences in the particular experiences which are _conceptualized_ by the child or differences in what the child chooses to _communicate_. Bowerman (1978, p. 360) states, " . . . evidence is

accumulating that Nelson's Referential versus Expressive distinction may reflect the effects of genuine differences of cognitive style on children's language acquisition."

The early research on child language acquisition not only excluded individual differences as a topic of interest, as discussed above, but also was relatively unconcerned with the child's linguistic environment. This, of course, was due to the assumption that language acquisition was an innate process, and, that it had to be innate because the learning skills of the 18-month-old were quite inadequate for deriving complex grammatical rules from an on-going stream of adult speech. Subsequent research in the early seventies (Drach, 1968; Broen, 1972; Snow, 1972), however, was able to demonstrate that adult-to-child speech differs in very significant and predictable ways from adult-to-adult speech. Broen's study, for example, found the following: 1) Mean utterance length and speech rate were greatly reduced as compared to adult-adult speech, and increased with age of child. 2) Pauses were found to occur only at sentence boundaries. 3) Mothers made frequent use of repetition. 4) Sentence structure was simple; complex linguistic structure was not used. 5) Prosodic features were distinctive, including higher fundamental frequency of pitch, and exaggerated intonation patterns.

Since this early study by Broen, the literature on mother-child language has steadily grown and many of these findings have been replicated (e.g. Holzman, 1974; Lord, 1976; Phillips, 1973; Snow, 1972; Newport, 1976; Moerk, 1974). It has also been found that non-mothers (Snow, 1972), older children (Shatz and Gelman, 1973; Sachs and Devin, 1976) and fathers (Berko-Gleason, 1975; Giattino and

Hogan, 1975) also modify their language in various ways while addressing young children. Studies by Lord (1976), Moerk (1974) and Newport, Gleitman and Gleitman (1977) have stressed the highly redundant and referential nature of mother-child language. More recently, Snow (1977) has reported a "turn-taking," conversation-like, vocal/verbal interaction between mother and child which begins early in infancy.

Thus, it has been clearly established that there is an identifiable "speech register" (labeled "motherese" by Newport (1976)) which is used when addressing young children. Subsequently, attempts have been made to examine the relationships between mothers' language and the child's language development. Researchers in this area were further motivated by results of more global studies of mother-child interaction which reported strong relationships between the quality of verbal stimulation provided for the child, and later competence, particularly linguistic competence. One such study was a study reported by Clarke-Stewart (1973) which investigated several mother-child interaction variables. Subjects for the study were 36 mother-child pairs; children ranged from nine to 18 months of age. The study was longitudinal, including twelve monthly home visits. One of the strongest relationships reported by this study was a positive correlation between amount of verbal stimulation directed to the child, and later development of cognitive and linguistic skills.

Several recent investigations have tried to determine relationships between the specific characteristics of mothers' verbal input to the child, and the child's linguistic development (e.g. Lord, 1976; Newport et al., 1977; Furrow, Nelson, and Benedict, 1978; Cross, 1977, 1978). One of the important underlying questions of these studies is

the extent to which the child's language behavior is shaped by his/her language environment. Although the methodologies of these studies (which have used simple correlational techniques) have not allowed demonstration of casual relationships, the authors have drawn various conclusions.

In a study by Lord (1976), which was a two-year longitudinal investigation of three mother-child pairs, a variety of correlational measures of mother and child language were made. These included such variables as mean length of utterance, sentence complexity, sentence well-formedness, sentence types, etc. The results of the study suggested that, in general, one could not predict specific mother measures from child measures. For example, it was not predictable that the mother of the child with the longest MLU would also have a long MLU. Furthermore, Lord found an abrupt change in mothers' language when the child began using single words, characterized by greater redundancy, increased referentialness, and shorter MLU (as did Snow (1977)). Lord therefore concludes that it is the degree of "tuning" to the child's cognitive level that facilitates language development. That is, the mother does not teach language to the child, but, rather, responds to the child. The extent to which mothers' responses are finely tuned to what the child is attempting to communicate, or to what the child can comprehend will determine the degree of facilitation of his/her language development. Similar findings have recently been reported by Cross (1977, 1978) who found that accelerated syntactic development in children was related not to mothers' syntax, but rather, primarily, to mothers' use of semantic extensions.

There were, however, other interesting results in Lord's study,

which she chose not to stress in her discussion. Surface structure characteristics of children's speech often reflected mothers' surface structures in various ways. For example, the child whose mother used the most single words and sentence fragments, also used primarily single words and fragments; the child whose mother used more complete sentences, used telegraphic sentences rather than single words or fragments.

Thus, Lord's results seem to support two notions: first, that mothers are "tuned in" and very responsive to their child's level of cognitive development; and, second, that the particular linguistic style of the mother does influence, in some ways at least, the linguistic development of the child.

A similar study was done by Newport et al. (1977), which studied 15 mother-child pairs over a much shorter time period (two sessions, six months apart). Despite a number of methodological differences, the results of this study were strikingly similar to Lord's. Newport et al. also conclude that a mother is not <u>teaching</u> her child language, since the <u>general</u> characteristics (e.g. sentence complexity and MLU) of the child's emerging competence seem to be insensitive to the maternal speech environment. Here again, however, as with the Lord study, such a conclusion is not fully supported by the results. Newport et al. also found that particular surface structure characteristics of the mother's language system seem to predict the rate at which the child learns certain syntactic constructions.

A recent study by Furrow, Nelson, and Benedict (1978) also attempts to look at this relationship between mother language and child linguistic development. Furrow et al. also use correlational

techniques; but unlike the previous studies they attempted to examine the relationship between mother language and subsequent linguistic development in the child, as well as concurrent functioning. The study analyzed samples of mother and child language when the child was 18 and 27 months of age. Measures used were a subset of those used previously by Newport et al. Correlational techniques analyzing the relationship between mothers' language when the child was 18 months old and the child's productive language at 27 months produced a number of strong correlations. Furrow et al. concluded that the complexity of mothers' speech at 18 months was negatively correlated with later language development, and that use of certain kinds of constructions (particularly yes/no questions) related positively to later language development.

Thus, contrary to the studies by Lord and Newport et al., Furrow et al. conclude that mother language is a teaching language. Their findings would seem to support the notion that mother language shapes linguistic development in the child rather than being merely responsive to it. A recent article by Slobin, (1975) which reviews a number of studies investigating the characteristics of child-directed language concludes the following (p. 295):

> It is clear, however, that the thread thrown out to guide LAD and LAS through the labyrinth of language is substantial enough to give them a start through the maze.

Slobin (aside from his metaphors and his tribute to feminism!) is clearly conceding here that there is strong evidence that "motherese" can have a facilitative effect upon child language development.

Statement of the Problem

The discussion above suggests that there is a growing interest in the effects of the linguistic environment on the language development of the child. Despite this interest in the child's natural environment, the data collection procedures utilized by nearly all the studies in this area have involved tape recorded sessions, with the experimenter present, in which the mother was encouraged to "interact normally" in a play situation with her child. The earliest studies of this type were done in laboratory playrooms (Phillips 1973; Snow 1972; Broen 1972). There is some question as to just how representative such play interaction really is. White's (1971) longitudinal study of children from birth to three years reported that the typical interaction between mother and child lasted approximately 30 seconds, and that extended interchanges of even five or ten minutes were markedly rare. Clarke-Stewart (1973) in her study of mother-child interaction, reported that an average of only 4% of a child's awake time was spent playing with the mother.

In addition, the presence of an observer, even one with whom the mother has become familiar, significantly alters the context in which communication takes place. There is fairly strong evidence in the literature (Benedict, 1978; Broen, 1972; Shatz and Gelman, 1977) that context alters mothers' communication style. Furthermore, being observed especially alters mothers' communicative styles. Zegiob and Forehand (1975a) observed mothers and their five-year-olds under two conditions: one in which they were informed they were being observed via one-way mirrors and the other in which mothers believed themselves to be unobserved in a waiting room. Comparison of mothers' behavior

under the two conditions revealed that the informed condition produced more playing interactively, more positive verbal comments on the child's activity, and more attempts to structure the environment, using commands and questions. In a similar study by Graves and Glick (1978), mothers in the informed condition verbalized more, used more interrogative forms, were more positive, and used more repetition and gesturing.

Labov (1972), an investigator in the field of sociolinguistics, refers to the "observer paradox" which states that the presence of an observer may so alter the linguistic behavior of the observed that it becomes unnatural and atypical. Wells (1977) reported that the mothers in his study used expansions frequently with their children when being observed because they were being observed. They were attempting to make the child's utterances clear to the observer.

There is also evidence that children's language is influenced by context. For example, a study by Kramer, James, and Saxmon (1979) compared language samples of 5-year-olds obtained at home by the mother, with samples obtained in a speech clinic setting. Two measures were used to evaluate the children's language samples: Mean length of utterance was used to place the children in one of Brown's linguistic stages, and the Lee Developmental Sentence Scoring Test (DSS) was used to assess language complexity. When the clinic sample was used as the basis of analysis, both the MLU and DSS measures underestimated the child's ability as compared to the sample obtained in the child's home environment.

It would seem that before we can meaningfully determine the relationships between mother and child language, we must know the

contexts in which mothers actually communicate with their children, as well as what they choose to talk about in those contexts, and we must be able to reliably describe the linguistic features of that communication. There is little evidence that this has been done. More recent investigators have attempted to increase the naturalness of the observation situation by going into the child's home. However, in some cases mothers were asked to play with the child in ways that are perhaps not at all "natural," e.g. using unfamiliar, "standard" sets of toys, for extended periods of time, while the investigator records the interaction (e.g. Lord, 1976; Cross, 1977, 1978). In other studies mothers are asked to engage in their "normal routine" for one to two hours while the investigator observes (e.g. Bloom, 1970' Moerk, 1974). For several studies reported in the literature (e.g. Holzman, 1974; Drach, 1968; Lieven, 1977; Newport, 1977) detailed information on the data collection procedures is not available.

Thus, while there is a growing interest in determining the relationship between various aspects of mothers' communication and language development in the child (Lord, 1976; Newport, 1976; Newport, Gleitman and Gleitman, 1977; Cross, 1978), there has been much less concern about what the true nature of mother communication really is. In a certain sense, researchers in this area have put the proverbial cart before the horse. The important first question should be "what is the nature of the linguistic environment of the child?" This general question subsumes such questions as "who talks to the child?" (The current emphasis on "motherese" seems to assume that other persons in the child's environment are relatively unimportant as sources of language stimulation.), and "In what contexts do these persons talk to

the child?" (There has been almost no investigation in this area. This is due perhaps to serious methodological problems, which will be considered later in this discussion.)

Only after the linguistic environment has been described can the second important question logically be asked: "What is the relationship between linguistic environment and language development in the child?" This question includes not only the relationship between specific linguistic and pragmatic characteristics of mothers' language to child language, but also the following kinds of questions? "Do the number and types of speakers in the child's environment influence the way in which he develops language?" "Do the types of contexts in which language interaction takes place affect child language development?", and if so, "Does this reflect the effect of context on the linguistic characteristics of mothers' language?"

Most studies investigating the relationship between mother and child language have focused primarily upon the child's rate of language development and levels of syntactic complexity (Cross, 1977, 1978; Lord, 1976; Newport, 1976). These studies appeared to be searching for what might be called "universal facilitative effects" of mother's language interaction style upon linguistic (primarily syntactic) development in children. As discussed above, the results of these studies have been, in some ways, inconclusive. If, as Nelson and Bloom suggest (see also Bowerman, 1976, 1978; Lieven, 1978), there are qualitative differences in children's strategies or styles of language acquisition, it might, then, prove useful to try to determine the relationships between particular characteristics of mothers' language and the type of language acquisition strategy used by the child. While

rate of language development is a measure which is confounded with rate of maturation, it is possible that a more "micro" analysis, taking into account stylistic differences, might lead to better understanding of the relationship between the child and his/her linguistic environment. For example, it may be the case that children's early language learning strategies reflect some inherent cognitive style differences. If so, it is possible that as Nelson (1973) suggests, the extent to which a mother's communication style is congruent with the child's own ways of perceiving and organizing his experience will determine the degree of facilitation of language learning. On the other hand, a child's early choice of communication strategy may reflect the particular ways in which the adults in his/her environment interact with that child. Rather than simply viewing children as either a) possessing universal language acquisition devices which will function in a fairly predictable way, regardless of environment, or b) waiting passively to be influenced by their linguistic environment, examination of individual differences may have greater potential for understanding the interactive relationship between the language learning child and his/her environment.

Research Questions

The study to be presented here has attempted to look at some of the questions mentioned above. Specifically, this study has attempted to explore the following three questions:

1. What are the characteristics of mothers' communication to their children within the various contexts which naturally occur in the child's daily environment? Can different patterns of communication style among mothers be identified?

2. Do the differences between children in early language acquisition simply reflect random population variance, or are there identifiable patterns? More specifically, can a) the expressive-referential distinction as posited by Nelson (1973) be verified? That is, is it possible to identify two different strategies of early lexical development: one characterized by a predominance of labels for things in the environment (referential) and another characterized by a more even distribution of words among word categories and greater use of personal social expressions, function words, pronouns, and early use of word combinations (expressive)? And, b) can different patterns of language use be identified. In particular, are there differences in the extent to which children use early vocabulary to label, to respond to events and attributes, and to make requests.

3. Given that different language acquisition patterns can be identified in young children, what is the relationship between these characteristics and the characteristics of mothers' communication styles.

METHOD

Research Design

There were two major objectives of this study. The first was to obtain an accurate record of the child's earliest use of productive language. There were a number of methodological impediments to obtaining this first goal. The nature of the twelve to twenty-month-old human organism is such that meaningful observations of its function outside the caretaker-child dyad are almost impossible to obtain. The uniqueness and exclusivity of the parent-child relationship--and also the very real problem of speech unintelligibility at this early age--necessitated the use of parents as informants, thus introducing a degree of variability into the data collection process.

Twenty families were selected for participation in the study. They were requested to keep careful records of their child's earliest productive vocabulary. In an attempt to reduce data collection variability as much as possible, all parents received a standard set of instructions for filling out the daily diary sheets (see below). In addition, each family was interviewed by-weekly by the investigator in an attempt to insure accuracy and completeness of information obtained regarding the child's vocabulary and language function.

The sample size originally chosen for the study was 20. While

this is a small number statistically, it was considered the maximum size sample on which a single investigator could carry out a longitudinal study, as well as subsequent data analyses.

The second goal of the study was to describe the "typical" languate environment of the child during this early stage of development. This required observing, in some way, each of the twenty families in their natural daily routines. As discussed earlier, few studies have seriously attempted to maximize the "naturalness" of situations from which language samples were obtained (with the exception of Wells, 1976 and Friedlander, Jacobs, Davis and Wetstone, 1972). The obvious problem here, of course, is that once any kind of observation is attempted, the situation is, by definition, no longer "natural." Studies by Zegiob, Arnold and Forehand (1975) and Graves and Glick (1978) have clearly demonstrated observer effects upon mother-child interactions. It was, therefore, felt that, despite methodological difficulties, such effects should be minimized as much as possible.

The method chosen for this purpose--the placement of voice-actuated recording equipment for a two-day period in the home--admittedly sacrifices important contextual information which could only be obtained visually. However, the rationale here was that contextual details which are generated by artificial and atypical interaction situations are not preferable to auditory data alone when the purpose of the study is to investigate "typical" mother-child language interaction.

Thus, the research design of the present study was multifaceted, including 1) data obtained longitudinally via diaries and interviews on the early productive language used by children; and 2) an

extensive, representative sample of each child's linguistic environment obtained via audio recordings; and 3) once each of these sets of data were described, an attempt was made to determine whether there were systematic patterns of relationship between them.

Subjects

Due to the necessarily small sample size, several restrictions on subject selection were needed to increase homogeneity of the sample. The subject selection criteria for the study were as follows: only-children of white, intact, middle class, English-speaking families. Mothers' employment outside the home could not exceed ten hours per week, nor could she provide daily child care in her home for other children. Father's occupation and parent education level were not controlled. Parent education level ranged from high school diploma to Master's degree, with the mean number of years of education post-high school being 1.74 for mothers and 2.7 for fathers. Father's occupations consisted of the following: 10 were blue collar workers, 6 were white collar or professional, and 3 were college students. A subject pool was first obtained by use of birth records and newspaper birth announcements. A letter of introduction describing the study provided the initial contact with potential subjects (see Appendix A). Each of the families selected received a $30 honorarium in order to provide incentive for continued participation in the study.

Given the restrictions, obtaining the proposed 20 subjects proved to be difficult. Due to this factor, and the problem of attrition, the final sample on which the analyses were done consisted of 19 subjects: 10 females and 9 males whose ages ranged from 14 to 17 months at the beginning of the study. The first visit was made when the child had at

least three but fewer than 20 words[1]

Procedure

Part I. Determining Child's Communicative Style.

At the beginning of the study the child's current productive vocabulary was inventoried by the mother. In addition, the mother was given instructions for keeping a Language Acquisition Diary for all new words acquired by her child (see Appendix B). Words did not need to be phonemically accurate to be considered "true words," but the child's production of the word had to be fairly consistent from one instance to the next[2]. While the diaries included imitated words and phrases, as well as spontaneous, only those words which occurred spontaneously on two or more days were considered part of the first 50-word vocabulary. Words which achieved vocabulary status, and then dropped out of the child's repertoire were still counted in the first 50 words acquired.

Each subject was visited every two weeks except when illness or vacations made this interval impossible. The diary information was supplemented by an in-depth interview with the mother at each visit. Interviews reviewed previously acquired vocabulary in order to determine changes in meaning and use of each word over time. For purposes

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[1]Two of the children actually had nearly 30 words at the time of the first home visit. This was due either to inacuracy of parents' estimate at the time of the initial phone contact or to a rapid vocabulary development during the short period between the initial phone contact and the first home visit.

[2]In fact, at this age, there is very little phonemic "consistency" in children's language, as has been pointed out by Ferguson and Farwell (1975). "Consistency" here actually referred to parents' ability to identify the word from one instance to the next.

of analysis, each of the 50 words was categorized on the basis of its original use and meaning. After the child reached 50 words, he/she was operationally categorized as "expressive" or "referential," based on the proportion of those 50 words which were general nominals (see below).

Once the child had obtained 50 words, the bi-weekly visits were discontinued. Mothers were no longer required to record vocabulary acquisition. However, they were requested to record the child's first word-combinations. When the child had produced ten different word-combinations, a final follow-up visit was made. The data collected on word-combinations was exploratory, and will not be considered in the present analysis.

Part II. Assessing the Linguistic Environment.

When the child had acquired at least 30 but fewer than 50[3] words, the second part of the study was instituted.

In order to characterize the natural linguistic environment of each child, tape recordings were made in the home on two successive days. A voice actuated recorder was used (see Equipment below), with speech sensitive microphones placed throughout the home. It was felt that this extended data collection period would allow more realistic representation of adults' language than would intermittent, short sampling sessions. The rationale here was that while a mother might be able to effectively alter her interaction with the child for short periods of time, it would virtually be impossible to sustain such a

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[3]One child had actually acquired 56 words by the time the taping was done.

modification over two consecutive days. In addition, it was assumed that by eliminating the presence of the experimenter, more elements of the "naturalistic" environment could be preserved, as discussed previously. Furthermore, it was assumed that such a procedure would also provide more reliable information regarding the contexts in which adults talk to children (see Friedlander, 1972).

Three microphones were placed strategically throughout the home. Ample lengths of connection cord allowed the investigator to keep equipment hidden from view. Microphone wires were placed along floor mouldings, under rugs, and behind furniture. The recording components themselves were placed out of view, such as in a closet, or in an unused room. The attempt here was to make the recording equipment as unobtrusive as possible in order to minimize families' conscious awareness of its presence.

Parents were informed that any speech within a certain range of distance from the microphone would activate the recorder. It was explained that, while they were free to turn off the recorder at any time, the purpose of the study is to investigate typical rather than optimal or carefully selected adult-child language interaction, and they were encouraged to leave the recorder on as much as possible when the child was present.

Recording equipment was set up the night before the first day's taping. At this time parents were instructed regarding the operation of the recorder. They were instructed that they may turn off the recorder whenever they wished, and were encouraged to turn the recorder off during the child's naps. They were not to alter their daily routine in any way, with the exception that, in some homes,

parents were requested to set the volume of radios and TV's at a lower level.

There were a total of three tapes for each child. Tape One was started on Day I as soon as the child awakened, and was left to run until the child retired or the tape ran out, whichever occurred first. At the end of Day I, Tape One was rewound and Tape Two was set up. The experimenter contacted each family at the end of Day I by phone to insure that the tape had been changed and there were no problems. When problems arose or when parents were uncomfortable about making the tape change themselves, the experimenter set up Tape Two. Tape Two was started on Day II as soon as the child awakened, as for Tape One. On Day II, however, the tape was rewound just prior to the child's lunch time. At this time Tape Three was set up and the Akustomat (the automatic start/stop switch) was removed. Tape Three was then left on for the remainder of the day (except for naps, etc., as above). While Tapes One and Two are somewhat compressed because of the operation of the voice-actuated switch, Tape Three represents "real time" and could provide information about amount of child-directed speech per unit of time. Parents filled out an activity summary sheet for each day (see Appendix C) which indicated the hourly activities of the child and parents.

Tape One was not included in the linguistic data base for the present study, since Day I was intended to serve as an initial "desensitization" period in which parents could become accustomed to the presence of the recorder. Parents were not informed of this, however. All three tapes were audited. The events and activities occurring on each of the tapes were identified and described.

Linguistic transcriptions of Tape Two and, in some cases, parts of Tape Three, were done for ten subjects (see below). Transcribers were trained to insure consistency and reliability in transcriptions. (Transcription procedures are presented in Appendix D.) A fifteen minute segment of a pilot tape was used to assess each transcriber's accuracy prior to their transcribing the actual research tapes. All tape segments selected for detailed analysis were re-transcribed by the investigator. Transcription reliability ranged from 84% when utterances of questionable intelligibility were included (for any tape, 10-20% of all utterances were of questionable intelligibility, depending upon the quality of the recording), to 96% when these utterances were eliminated.

Equipment

The following equipment was used in this study: The Uher Model 5000 reel-to-reel tape recorder was selected for its durability and portability, and particularly because of the slow recording speed (15/16 ips) available on this model. This feature together with the use of Scotch 1800 ft. recording tape (five-inch reels) made it possible to record for six hours without changing reels. In addition, use of the Uher, F-411 Akustomat (an automatic start/stop switch which automatically activated the recording system in response to sound, and switched the system off after 5 seconds of silence or low level background noise) allowed maximum efficiency in tape use. A JVC (SEA-30) frequency equalizer was used to enhance the system's frequency response in the range of human speech. This component was added in an attempt to damp out the tremendous amount of ambient noise which is typically present in the home environment. Three highly sensitive

AKG-D160 omni-directional microphones, with adjustable desk stands and ample connection wires, enabled strategic microphone placement. The quality and flexibility of this component of the system contributed immeasurably to the system's success. Finally, a Shure M-67 microphone mixer allowed separate gain control settings for each microphone.

To facilitate transcription of the recordings obtained by the system described above, two additional devices were utilized: A Uher F-261 foot control switch eliminated the need for manual operation of the "start", "stop" and "rapid rewind" functions of the recorder. This proved to be a significant time-saving device in transcription and descriptive stages of data analysis. Uher W-214 stethescope headphones were also employed for easier tape audition.

Measures

This study consisted of two main variables: Child"s Communicative Style (CCS), based on diary information regarding his/her early expressive vocabulary, and Mother's Communicative Style (MCS) as determined from the in-home recordings. While, as has been acknowledged previously, mother's communication makes up only a part of the child's total linguistic environment, for purposes of the present study, only mothers' language was analyzed in detail. However, since nearly all tapes contain samples of fathers' communication with their child, and since there is very little data available on father language (Berko-Gleason, 1975; Giattino and Hogan, 1975; Friedlander et al., 1972), this data will be analyzed at a later date.

Child's Communicative Style

Nelson's categories. Each of the child's first 50 words was categorized using a modification of Nelson's classification system. Only Nelson's major categories, and not her subcategories were used. Each word was categorized as one, and only one, of the following:

1. Specific Nominal: refers to a particular object, person, pet, etc., and does not refer to more than a single exemplar of a class. This includes all proper names.

2. General Nominal: refers to more than one member of a category of persons, objects, animals, or substances ("ball," "milk," "doggie," etc.).

3. Pronouns: includes words generally corresponding to pronouns in adult language ("me," "I," "it," etc.). While pronouns were originally considered general nominals in Nelson's study, they are given a separate category status here, since both Nelson and Bloom have identified use of pronouns as a discriminating feature of two patterns of early language development.

4. Action Words: used to describe, demand, or accompany action ("ride," "byebye," "up," etc.), or to demand attention ("hi," "look," "see," etc.). Unlike Nelson's system, words for social action games such as "patty cake" will be included in this category, as suggested by Benedict (in press).

5. Modifier: expresses attribution ("big," "pretty"), state ("hot," "allgone"), location ("there," "outside"), or possession ("mine").

6. Personal social: expresses an affective state ("want," "ouch," "no," "yes"), or social stereotype ("please," "thank you,"

"okay").

7. Function Word: performs a grammatical function such as a question ("what," "where"), or is used only in relation to other words ("for," "is," "to").

Using Nelson's criterion, referential children were those whose 50-word vocabulary contained greater than 50% general nominals; those with less than 50% general nominals were categorized as expressive.

Function Categories. Several authors have discussed the importance of considering pragmatic functions in the investigations of early language development (Halliday, 1975; Bates, 1974, 1975, 1976; Dore, 1975; Rodgon, Jankowski and Alenskas, 1977; Wells, 1974).

According to Halliday, (1975), the children in the current study would be in "Phase II" of language development. Phase II represents the introduction of the level of form, i.e., most meanings are expressed by means of lexical items which have some recognizable phonemic "form." In Phase I meaning was expressed primarily by intonation and gestures. Phase II, which begins at approximately 15 months, is a transition into the adult system of language which consists of three levels: sound, lexicogrammar, and meaning. Halliday reports that in Phase II six different language functions could be identified in the repertoire of his son Nigel: instrumental, regulatory, interactional, personal, heuristic, and imaginative.

Rodgon, Jankowski and Alenskas (1977) presented a three-dimensional coding system for single word utterances: One of these dimensions was referred to as "structural linguistic" but actually consisted of several categories of language use as well.[4] These included naming, getting attention, demanding object, assertion, habitual

association, and so-on.

Wells (1976) has studied language meaning and use in two-year-old children. He suggests that any utterance can be categorized three ways: by its "topic" (i.e., its content), "discourse" organization (i.e., how content is organized), and its "interpersonal" features (i.e., its function, such as asking, commanding, etc.)

While each of these authors has developed a somewhat different categorization system, they all address the developmental aspects of language use in early communication. None of the systems developed by the authors above has been sufficiently well-defined to provide detailed analyses of earliest language development. Thus, the current study has empirically evaluated the uses of each child's first 50 words. The following categories of word use emerged for the sample of children investigated:

1. Label: Child names object or person, without making any demand or request. For example, the child notices a ball lying on the floor, points to it, and says "ball," simply to identify the object.

2. Accompanies action: Any utterance which typically accompanies an action in which the child engages. For example, the child jumps up and down saying "jumping," or rides a rocking horse and says "rock rock."

3. Response to event: Any utterance which is a response to a particular event. For example, after some one else sneezes, the child says "achoo," or each time the child hears an airplane flying

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[4]The impossibility of separating language structure and meaning from its function is again apparent here.

overhead, the child says "plane." (In this case, plane is not a label because he only uses the word following the event of the plane flying over his house. Were the child to see a plane in some other context, the child would not say "plane.")

4. Response to attribute: Child responds to a particular characteristic of the object such as "hot," "cold," "pretty," "all-gone".

5. Response to question: This category includes responses which the child may use to respond to any yes-no question, for example "yes," "no," "okay," "uhuh" etc.

6. Verbal game: A verbal game consists of any rehearsed response to a specific question or statement from the parent. For example, the mother says "what's the cow say?" and the child responds "moo," or the mother counts "one, two," and the child says "three." The child does not produce the word in the absence of the specific prompt.

7. Requests: This final category contains several sub-types. The commonality among them is that they all represent attempts by the child to control or manipulate his/her environment.

   a. Request object: The child uses a word to obtain a desired object. The word used may be the name of the object, e.g. "cookie," or a word such as "that" or "want" accompanied by gestures (e.g. pointing) which make it clear that the child desires a particular object. This category also includes the words "mine" and "more" since in the current sample these words were always used to obtain something the child desired.

   b. Request action: The child uses a word to request that

some action be performed, e.g. "up" for wanting to be lifted up or "outside" when the child wishes to go outside.

c. Request attention: Any word which the child uses primarily to direct attention upon himself is considered a request for attention. For many children words such as "Hi," "see," "Mama" functioned exclusively in this way.

d. Request label: The child uses a word such as "that" or "wha'dis" which functions to request the adult to produce a label for an object.

Mother's Communicative Style

The ways in which one might characterize mothers' communicative style are innumerable. Research on mother-child interaction (e.g. Snow, 1972, 1977; Clarke-Stewart, 1973; Bruner, 1975) has shown that mothers communicate with their children in many different ways, both verbally and non-verbally, and that this communication begins as soon as the child is born. Among the non-verbal factors which have been considered important are eye-contact, joint action (Bruner, 1975), turn taking (Snow, 1977), and immediate responsiveness (Kagan, 1968). Verbal factors which have been investigated can be divided (at least theoretically) into two main categories: the communicative intent or functions of language, and the features of the linguistic code itself. In speech act terminology (Searle, 1969), this might be referred to as the locutionary versus illocutionary force aspects of communication (see also Bates, 1974 and Dore, 1975).

The measures to be used in this study to analyze mothers' communicative style are both linguistic and pragmatic, and have been selected from those reported in the literature which have been found

to be related in some way to child language development.

1. Pronominalization. This measure is the ratio of pronouns to nouns which occur in mothers' child-directed utterances. This measure is included because expressive children in Nelson's study were found to use a greater proportion of pronouns in their early vocabularies than did referential children. Furthermore, Benedict (1978), who has reported two distinct mother-child interaction styles (referential and action-oriented), found that one of the distinguishing features among mothers in a book-reading situation was their noun/pronoun ratio, i.e. the number of nouns used relative to pronouns.

2. Yes-No Questions. Nearly all investigations of mother-child language have examined the role of questions. Several investigators (e.g. Furrow et al., in press) have found that a high rate of yes-no questions in mothers' speech seems to be associated with earlier language development in children, thus suggesting a facilitative effect. This measure will be defined as the percentage of child-directed utterances which ask this kind of question, in any form, including deleted auxiliary ("Ya want some ice cream?"), tag questions ("The doll's going to sleep now, isn't she?"), rising intonation alone ("The dog is in the train?"), as well as the standard subject-auxiliary inversion ("Do you want to go?"). Wh-questions do not fall in this category.

3. Mean Length of Utterance (MLU). This category is included not only because it is probably the most frequent measure used by other investigators in this area, but because there was some suggestion in Nelson's study that the language of mothers of expressive children was characterized by somewhat longer MLU than mothers of

referential children (Nelson, 1973).

4. Noun Type/Token Ratio. This measure, which is the ratio of number of different nouns to total number of nouns used, is intended to reflect lexical reduction. It has been suggested above that mothers of referential children may make more frequent use of nouns relative to other word categories (e.g. pronouns, verbs, modifiers, etc.). Intuitively, one might also predict that, within the noun category itself, mothers of referential children use fewer different nouns than do mothers of expressive children. This might reflect a mother's being careful, in the early stages of language development, to label an object in one, consistent way, and to name it often. There is some evidence supporting this in Benedict's (1978) study of effects of conversational context on mothers' speech (unpublished data), in which one of the most highly variable characteristics of mothers' speech is noun type/token ratio.

5. Single word vs. Multiword utterances. These measures were designed to be more sensitive than MLU to mothers' use of shorter utterances as a facilitating strategy. The number of one-word utterances and the number of utterances which are longer than five words were counted. It was predicted that, since expressive children are more likely to produce multiword utterances as part of their early language, that mothers of these children are more likely to produce long utterances. It was also predicted that mothers of referential children would produce more single word utterances, thus providing these children greater experience with discrete lexical units.

6. Repetitions and Redundancy. Another frequently used measure reported in the literature is one which reflects mothers' use of

repetition (Kobashigawa, 1969; Benedict, 1975). Often, repetitions are defined in such a way as to reflect non-compliance on the part of the child. This occurs when repetition of semantic intent without actual repetition of the surface structure or lexical items themselves is considered a repetition. Using this definition the second sentence in the following sentence pair would be considered an utterance repetition.

a. Get the ball

b. I said get it.

The purpose of considering various types of repetition in the current study is to determine whether there are differences among mothers in their linguistic strategies for increasing redundancy in their communications to the child and whether this is done via the repetition of entire sentences and phrases or via repeatedly identifying the topic noun or action. For this study, in order for an entire utterance or part of an utterance to be categorized as a repetition, the surface features must, except for minor deviations, be retained. The following repetition measures were defined for use in the present study:

a. Utterance repetition: an exact repetition of an entire utterance which occurs within two utterances following its initial occurrence.

b. Partial repetition: any repetition of a <u>part</u> of an utterance consisting of a word-string of three or more words which appears within two utterances following the original occurrence of the utterance.

c. Noun repetition: Any repetition of a noun which occurs

either within the same utterance or within one of the next two utterances.

d. Modifier repetition: Any repetition of a modifier describing an attribute such as "big" "dirty" "hot" which occurs either within the same utterance or within one of the next two utterances.

e. Action repetition: Any repetition of an action word which occurs within the same utterance or within one of the next two utterances.

It is predicted that noun repetitions will be used more often by mothers of referential children, and that utterance and partial repetitions will occur more freqently in mothers of expressive children.

7. Imitations. Some authors have observed a characteristic of mothers speech which appears to reflect her efforts to maintain a conversation or dialogue with her child. Snow (1977), for example, has observed the occurrence of vocalization "turntaking" between mothers and their young infants. Halliday (1975) has discussed the importance of the development of dialogue skills in children. One device which mothers appear to use to develop this kind of interaction is that of imitation. That is, mothers imitate the child's utterance, apparently in an attempt to maintain dialogue with a child who has minimal language skills, and to reinforce his efforts at speech. This measure will simply record the frequency of this phenomenon in the mother's speech.

8. Commands and Prohibitions. Nelson (1975) commented that there seemed to be a tendency for mothers of expressive children to be much more "intrusive," using more imperatives and fewer questions

than mothers of referential children. The measure "commands and prohibitions" is intended to evaluate a non-linguistic as well as a linguistic aspect of interaction style. All imperative sentences, e.g. "Stop that," "Don't," "Give it to me", as well as use of prohibitions such as "No" or "you can't do that" are counted in this category.[5]

9. Object reference. This measure refers to any reference made by the mother to an identifiable object present in the child's immediate environment. The utterance need not actually contain the object name, but must in some way, comment upon or draw the child's attention to the object. For example, "Go get it," or "Isn't that pretty" are object references just as are the utterances "Go get the ball" and "Isn't that a pretty doll."

These measures are designed to assess two levels of mothers' language. The first five (Pronominalization, Yes-No Questions, Mean Length of Utterance, Noun Type/Token Ratio and Single vs Multi-word Utterances) describe surface structure features of mothers' utterances. The last four measures (Repetitions, Imitations, Commands and Prohibitions, and Object References) describe pragmatic aspects of mothers' language and reflect "interaction" or "communication style" in a functional way, i.e. how the mother uses language as she interacts with her child.

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[5]It is true that use of surface features alone may miss those utterances whose illocutionary force is clearly imperative, while the sentence structure is not. For example, "Will you stop that!" has an imperative meaning, while the structure is interrogative. However, the written transcripts used for this particular analysis did not have sufficient information regarding context and intonation to make judgments of semantic intent reliable.

Reliability of Measures

Reliability scores for the measures defined above are presented in Table 1. Because several of the characteristics being identified occurred infrequently in the mothers' speech samples, the use of a correlatonal procedure, such as a Phi coefficient or product-moment correlation, could significantly inflate the reliability scores. Thus, the following calculation was performed on each measure to determine percentage of agreement. This provided a more stringent measure of reliability than would a correlational procedure.

$$\frac{\text{Number of Agreements}}{\text{Number of Agreements + Number of Disagreements.}}$$

All measures and categorizations were first performed by the investigator. A research assistant was then trained on the coding criteria. Six 50-utterance transcripts of the mother's speech, and three children's first 50 word vocabularies were selected randomly for re-coding by the research assistant. The coding procedures which were used on the mothers speech are included in appendix E.

TABLE 1
Coding Reliability for Measures of Mother's
Communicative Style and Children's Word Categories

Mother Communication Style Categories

Imitation	84%
Modifier Repetitions*	
Partial Repetitions	78%
Utterance Repetitions	63%
Noun Repetitons	82%
Noun Types	86%
Noun Tokens	91%
Third Person Pronouns	80%
Commands/Prohibitions	87%
Object Reference	91%
5-Word Utterances	98%
Single Word Utterances	91%
Words per Utterance	96%

Child Communication Style Categories

Nelson Categories (overall)	91%
Use Categories (overall)	96%
General Nominal	89%
Specific Nominal	89%
Action	88%
Modifier	73%
Personal Social	100%
Function Word	100%
Pronoun	100%
Label	90%
Response to Attribute	100%
Response to Event	75%
Verbal Game	67%
Accompanies Action	65%
Requests	96%

Note: $\text{Reliability} = \frac{\#\ \text{Agree}}{\#\ \text{Agree} + \#\ \text{Disagree}}$

*Too few instances of modifier repetitions to determine reliability

RESULTS

The results of this study will be presented in two parts. First, the diary data will be analyzed in order to provide descriptive information about children's early productive vocabulary, both with regard to Nelson's categories, as well as how children actually use their first 50 words. It is on the basis of Nelson's "General Nominal" category that two types of language style--"expressive" and "referential"--will be operationally defined. The subjects whose first 50 words contain greater than 50% General Nominals will be labeled referential while those subjects with fewer than 50% will be labeled expressive (Nelson, 1973).

Second, mothers' communicative styles will be evaluated via results of analyses of the in-home tapes. Mothers of the five most referential and the five most expressive children will be compared with regard to the various measures used to describe mothers' communication with their children.

Children's Communicative Styles

As stated earlier, a total of 19 children were used in this study, ten females and nine males. The average age of the children at the beginning of the study was 15.4 months. The average age at acquisition of 50 words was 18.5 months, with a range of 14.8 to 22.9 months.[6] The average age at the time of the in-home taping was 17.6 months.

Figure 1 presents a summary of all word categories used to describe children's early communicative styles. (These categories were discussed earlier under Method.) While there is some overlap between the two classifications systems (Nelson's and the empirically derived Function categories) there are important differences. Nelson's categories represent a variety of aspects of language, including semantic features (e.g., Function Words), and pragmatic features (e.g., certain sub-types of Action Word category, such as words used to get attention). In order to determine more clearly how children actually use their early vocabulary, (in addition to what particular lexical items are included in that vocabulary) the Function Categories summarized in Figure 1 were developed to characterize the communicative uses of the first 50 words of the current sample of children.

Table 2 summarizes the mean scores in each word category for all 19 subjects. With regard to Nelson's categories, it can be seen from this table that names for people and things (General Nominals and Specific Nominals), on the average, made up well over half of the first 50 words used by the children in this sample. Action Word was the next largest category, accounting for over 20 percent of the total. The remaining categories of Modifier, Personal Social Expressions, Pronouns, and Function Words, were relatively infrequent and

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[6]This finding was approximately one month younger than that found by Nelson (1973) who reported that the average age at 50 words was 19.6 for her sample of 18 subjects. The difference here may be related to the fact that several children in Nelson's sample had siblings. Nelson found that the rate of language development tended to be slower for children with siblings than for only children. This finding is further supported by research by Benedict (1976) whose sample also consisted of only children. Benedict found a mean age which was identical to the one found in the current study of 18.5 months.

Word Category	Definitions	Example
	Nelson Classifications	
1. General Nominal	Refers to more than one member of a category of persons, objects, animals, or substances.	ball, milk, doggie
2. Specific Nominal	Refers to a particular object, person, pet, etc., and does not refer to more than a single exemplar of a class. Includes all proper names.	Daddy, Rover, Susan
3. Action Words	Used to describe, demand, or accompany action or to demand attention. Also includes words for social action games such as "patty cake."	ride, up, go hi, bye, look pattycake
4. Modifier	Expresses attribution, state, location or possession.	big, pretty hot, allgone there, outside mine
5. Personal Social	Expresses an affective state, or social stereotype.	want, ouch, no please, thank you, okay
6. Pronoun	Includes words generally corresponding to pronouns in adult language	me, I, this
7. Function Words	Performs a grammatical function such as question or is used only in relation to other words.	what, where for, is, to

Figure 1
Definitions of word categories used to describe children's first 50 words.

Word Category	Definitions	Example
	Function Classifications	
1. Label	Child names object or person, without making any demand or request. Child simply identifies object.	Child points to ball and says "ball."
2. Accompanies Action	An utterance which accompanies an action in which the child himself is engaged.	Child riding rocking horse "rock rock."
3. Response to Attribute	Child responds to a particular characteristic of an object.	Child touches hot food and says "hot."
4. Response to Event	Child responds to a particular event.	Someone sneezes, and child says "choo."
5. Response to Questions	Includes responses which the child uses to respond to any yes-no type question.	Mother asks question and child says "yeah," "okay," "uhuh," etc.
6. Verbal Game	Any rehearsed response to a specific question or statement. The child does not produce the word in the absence of the specific prompt.	Mother says "what does the cow say?" and child says, "moo."
7. Request for Object	Child uses a word to obtain a desired object. The word used may be the name of the object, a word such as "that" accompanied by gestures, or the words "Mine" or "more."	Child requests cookie by saying "cookie" or "want" accompanied by gesture. Playmate has child's toy; child says "mine!"
8. Request Action	Child uses a word to request that some action be performed.	Child wishes to be lifted and says "up."
9. Request Attention	Child attempts to direct adult's attention toward himself.	Child wants mother to notice him and says "Mama" or "Look."
10. Request Label	Child uses a word which means "What's that" and functions to request the adult to produce a label for an object.	Child points to a picture in book and says "this" and expects parent to name.

Figure 1 (continued)

TABLE 2
Distribution of First 50 Words Among
Word Categories for All 19 Subjects

Word Category	Mean Number Words Falling into Category
(Nelson's Classification)	
General Nominal	24.60
Action Word	11.07
Specific Nominal	6.02
Modifier	3.34
Personal Social	2.86
Function Words	1.12
Pronouns	.84
(Function Classification)[a]	
Label	26.82
Accompany Action	5.25
Request Object	5.16
Response to Event	4.55
Request for Action	3.75
Response to Attribute	2.75
Request for Attention	2.56
Verbal Game	.96
Response to Question	.54
Request for Label	.43

[a]Total of Means in Function categories exceeds 50 because some words were classified as having more than one function.

made up the remaining 16 percent of the first 50 words.

It can also be seen from this table that the most frequent use of the first 50 words was to label, with an average of approximately 27 words being used in this way. An average of 12 of the first 50 words were used to make various requests or demands, and 5 were used to accompany actions. The remaining words were used as fairly stereotypic responses to events, yes-no questions and well-rehearsed verbal games.

As has been pointed out by Nelson, these kinds of classifications of the nature of each of the child's first 50 words does not characterize the frequency with which the child used a given word. For example, while a child's repertoire may contain some 30 or 40 words, it would not be surprising that 80 percent of that child's language output for any given day consisted of a single, potent word such as "Mama" or "look."

While these categorizations give us some sense of the characteristics of children's early vocabulary, in general, the more important question for the current study is how do children differ in the development of early language. The next section addresses this issue and and summarizes the results of comparisons between two groups of children who differ somewhat in lexical development and use of language.

Group Comparisons

Table 2 presents the average number of the first 50 vocabulary words in each of the Nelson categories for the entire group. The number of these first 50 words which were general nominals ranged from 10 to 38 for the 19 subjects. Using the criterion described earlier,

those children who had more than 25 General Nominals in their early vocabulary were labeled expressive. While the average age at acquisition of 50 words was greater for expressive than for referential children ($\bar{x}$ = 19.16 months as compared to 17.67 months), this difference was not found to be statistically significant ($t(17) = .93$, $p > .05$).

Of the 19 subjects, seven were referential and twelve were expressive. It should be noted that, of the seven referential children, the parents of all but one were college educated. The mean number of years of post-highschool education for parents of referential children was 3.14 and 6.72 for mothers and fathers respectively. For parents of expressive children, the number of post-highschool years of education was .91 for mothers and 1.25 for fathers. Product moment correlations between the number of General Nominals in the child's first 50 words, and number of years of parents' post-highschool education were computed for mothers and fathers separately. The results of these correlations suggest a significant positive relationship between education level and use of General Nominals ($r = .58$ and .66 for mothers and fathers respectively). This finding is an important one and will be considered further in the discussion.

Nelson's Categories. Table 3 presents the mean number of words in each of Nelson's categories for the two groups. Significant differences were found between the two groups in the categories of Action Words ($t(17) = 2.91$, $p < .01$), Personal Social Expressions ($t(17) = 3.26$, $p < .01$), Pronouns ($t(17) = 2.30$, $p < .05$), and Function Words ($t(17) = 2.18$, $p < .05$).

Referring again to Table 3a, it can also be seen that the mean

TABLE 3a
Differences Between Expressive and Referential Groups
in Number of Words in Each Nelson Category

	Referential		Expressive		
Category	Mean (n=7)	Proportion of first 50 words	Mean (n=12)	Proportion of first 50 words	t value
General Nominal	30.6	.61	18.6	.37	-----[b]
Specific Nominal	5.14	.10	6.91	.14	1.46[b]
Action Word	8.85	.18	13.3	.27	2.90**
Modifier	2.86	.06	3.83	.08	1.76
Personal Social	1.43	.04	4.30	.08	3.26**
Pronouns	.42	.01	1.25	.02	2.30*
Function Words	.57	.01	1.66	.03	2.18*
Word-Combinations	.57	----[a]	2.50	----[a]	2.57*

[a]Not applicable to word-combinations

[b]Since the number of subjects in the two groups was unequal (referential n=7, expressive n=12) it was necessary to compute t' for those comparisons in which the variances were not homogeneous. Variance homogeneity was determined using a simple test proposed by Hartley as follows: (see Winer, 1971, p. 206)

$$F_{max.\ 95}\ (2,11) = \frac{s^2 \text{ largest treatment variance}}{s^2 \text{ smallest treatment variance}}$$

Because t will either underestimate or overestimate the true t value, depending upon whether the (footnote b continued on next page)

*t(df=17) $<$ .05
**t(df=17) $<$ .01

number of word-combinations which occurred prior to the acquisition of 50 words was much greater for expressive than for referential children (2.50 as compared to .57). Inspection of the raw data suggests that there is a relationship between the use of word-combinations and the categories of Pronoun and Function Word. Of all word-combinations produced prior to acquisition of 50 words, 65% contained either Function Words or Pronouns, or both. Figure 2 presents examples of these types of utterances. Thus, the greater incidence of early word-combinations among expressive group children is at least partially responsible for the greater proportion of Pronouns and Function words.

There is evidence that the term "word-combinations" is inappropriate here. The term "multiword string" will be used to refer to word combinations occurring prior to the acquisition of 50 words. There is little evidence that these early combinations are true

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b, Table 3a (continued) larger sample has the larger or the smaller variance, t' was computed for those categories where variances were found to be unequal. The following computation of t' was performed formed according to Snedecor and Cochran, 1967, 114-116):

$$t' = (\bar{X}_1 - \bar{X}_2) / \checkmark \quad (s_1^2/n_1 + s_2^2/n_2)$$

The significance level of t' is approximately:

$$(w_1 t_1 + w_2 t_2)/(w_1 + w_2), \text{ where } w_1 = s_1^2/n_1,\ w_2 = s_2^2/n_2$$

Unequal variances were found for three categories: Specific Nominal, Verbal Game, and Request for Object. t' was computed for each of these, and the results are presented in Table 4. None of these values reached the .05 level of significance.

What this?	The dog.
What that?	I wanna.
Me too.	I love you.
Where Papa?	Here y'are.
I eat.	Help me.
My Dad.	Where go?
Is it?	Where is it?

Figure 2
Examples of Multi-word Strings Containing
Pronouns or Function Word

syntactic combinations of lexical items. They were essentially used as one-word utterances; and their components were almost never used alone or in combinations with other words.

In summary, then, it can be said that referential children's early vocabularies contain mostly names of things (general nominals), some action words and names of people (specific nominals), occasional modifiers and social expressions, but almost no pronouns, function words, or multi-word strings. Expressive children, on the other hand, were likely to have nearly as many action words as General Nominals, in their first 50 words. Although they too used Pronouns, Function Words and Personal Social expressions relatively infrequently, the used these words twice as often as did referential children. They were also more likely to produce multi-word strings prior to the

acquisition of 50 words than were referential children. Finally, no single category predominated for expressive children to the extent that General Nominals did for referential children.

Function Categories. As discussed earlier, a categorization system of language use was empirically derived using the diary data. Table 3b presents the mean number of words in each of these function categories. Unlike the Nelson categories, it was possible for a word to be categorized in more than one way if a mother reported that the child was as likely to use it one way as another. Interestingly, new vocabulary items seldom had more than one function. Only as the word became well-established as part of the child's language repertoire did it take on new functions. Halliday (1975) also observed this tendency in Nigel's early language development.

The greatest difference between the two groups was in the use of language for labeling. The difference between a mean of 33 for the referential group and 20 for the expressive group was highly significant ($t(17) = 6.51$, $p < .01$). This finding is, of course, not surprising given the definition of the two groups. Most general nominals are used as labels. However, it should be pointed out that the category "Label" used here is not synonymous with Nelson's "General Nominal" category. In Nelson's scheme, General Nominal refers to the meaning, rather than the use of a word. Thus a word which was used only to request an item, e.g. "bottle", would be categorized the same as pointing to a toy and saying "ball." Both are names of things and therefore categorized as General Nominal. In the use categorization system, however, the words "bottle" and "ball" would be categorized differently: while "ball" would be considered a label, "bottle" would

TABLE 3b
Differences Between Expressive and Referential Groups
in Number of Words in Each Function Category

Category	Referential Mean (n-7)	Expressive Mean (n-12)	t value
Label	33.14	20.50	6.51**
Accompany Action	3.85	6.66	2.62*
Response to Attribute	2.00	3.50	2.80*
Response to Event	3.85	5.25	1.27
Response to Question	.43	.66	.62
Verbal Game	.85	1.08	.89a
Request for Object	4.42	5.91	.83
Request for Action	3.10	4.41	1.18
Request for Label	.28	.58	1.76a
Request for Attention	1.71	3.41	2.17*

[a]Value of t'. See Footnote b, Table 3a
*t(df=17) < .05
**t(df-17) < .01

be categorized as a Request for Object.

A significant difference was also found for the category referred to as "Response to Attribute." Responses in this category were mostly "modifiers" which described a particular feature of an object or experience, such as "soft," "pretty," "hot," "dirty," "cold," "etc. An average of 3.5 words were used in this way by expressive children, and 2 by referential ($t(17) = 2.80$, $p < .05$). Inspection of the raw data reveals some interesting differences between the two groups. A major contribution to this category for expressive children was made by negative descriptors such as "dirty," "yuk," "stink," etc. However, these words were almost non-existent among referential children. (The only occurrence of this type of word use in the repertoires of referential children was one child's use of the word "dirty.")

Another category in which a significant difference in language function was found was the category "Requests for Attention." This category included all utterances whose primary purpose was to focus the caretaker's attention directly upon the child. These included such words as "mom," "Hey,", and "Hi." Expressive children used these words significantly more often with a mean of 3.41 out of the first 50 words, as compared with a mean of 1.71 for referential children ($t(17) = 2.17$, $p < .05$).

Three other categories of language function developed in this study are similar to the Request for Attention category in that they reflect children's efforts to control their environment: Request for Object, Request for Action, and Request for Label. While the mean in each of the four Request categories is greater for the expressive groups than for the referential group (see Table 3b), the differences

between the two groups reach significance only in the Request for Attention category. When the data are grouped together under a single category called "Requests", the difference between the group means does approach significance ($t(17) = 1.71$, $p < .10$).

Inspection of the raw data reveals another difference between the two groups related to use of language to control one's environment. This was found in the frequency with which the words "more" and "mine" were used. For the children in this sample, the function of these words is fairly consistent. "More" is a request for more food, and "mine" is an emotional request for an object in someone else's possession. These, together with the word "mama" or "daddy" used to request the presence or attention of a parent or caretaker, are clearly the most effective control words in a child's repertoire. Two referential children (28%) used the word "more", while six of the expressive children (50%) used this word. An even greater difference existed for the use of the word "mine." Only one referential child used this word (14%), while seven of the expressive children (58%) used it. No referential child used <u>both</u> "more" and "mine" while five of the expressive children used both. While it is not reasonable to subject these differences to statistical analysis due to the small and unequal n's, these findings are, nevertheless, suggestive of differences between the two groups.

The final category of language function which revealed significant differences between the two groups was the category referred to as Accompanies Action. This category includes words used to accompany the child's own action. For example, the child says "oh oh" while falling, or says "jump" while jumping, or "beep beep" while

pushing a toy car. As can be seen in Table 4, the mean for the referential group in this category was 3.86. For the expressive group the mean was a significantly greater 5.25 ($t(17) = 2.62$, $p < .05$).

In summary, then, it appears that, while referential children are much more likely than expressive children to use language primarily to label things in their environment, they are less likely than expressive children to use language to request attention, to accompany actions, or to respond to attributes, particularly negative attributes. There is some suggestion that, in general, expressive children make greater use of language to manipulate and control the behavior of people in their environment than do referential children. This is demonstrated by greater use of words like "more" and "mine" used as demands.

Mother's Communicative Styles

As described earlier, mothers' communicative styles were observed via in-home tape recordings. Using the procedure described earlier, a total of 57 tapes should have been produced (three for each of the 19 subjects). However, due to occasional human error, or mechanical malfunction of the recording system, two tapes were blank, and four were of relatively poor quality. Thus a total of 51 usable tapes was produced. Since these tapes ranged from approximately three to six hours in length, producing approximately 250 hours of taped material, it was important to devise some sort of data organization procedure which would allow efficient access to the data. The time required to make actual verbatim transcription of the tapes was approximately four to five hours for every hour of tape. Thus, transcription of all 51 tapes was not feasible. Each of the tapes was, however, audited and

described in its entirety. From these auditions, a catalogue of the contents of each was made. The catalogue recorded the activities and interactions which occurred within sequential intervals of 30 recorder counter units. On a separate sheet, the location, by tape number, of several target events (e.g., breakfast, play, book reading, etc.) was separately recorded. Using this separate sheet, supplemented by the catalogue, all key interactions for each subject could be reliably located for analysis.

In an effort to minimize the time required for data reduction, and to maximize any differences which might exist between the mothers of the two groups of children, tapes of the five most referential and the five most expressive children were selected for analysis of mothers' communicative styles. Nelson's General Nominal category was again used to define the two groups, with those children having the most General Nominals comprising the referential group, and the five children with the fewest making up the expressive group.

Once the ten mothers to be used in the analysis of mothers' communicative styles were identified, a procedure had to be devised which would allow comparisons between the two groups which would be uncontaminated by situational effects. It was thus necessary to find situations which could be operationally defined and which occurred on the second day of taping for each of the ten mothers.[7] It was predicted that two situations which might meet these criteria were a breakfast segment, and mother-child play segment. "Breakfast" was operationally defined as the 50 consecutive child-directed utterances which occurred following the mothers first mention of breakfast.[8] The number fifty was selected because all breakfast segments contained

fifty or more such utterances. In other words, some segments contained no more than fifty appropriate utterances, making fifty the maximum sample size which could be used.

The operational definition of "Play" proved to be somewhat more problematic. Prior to the execution of the study, Play had been defined as a playful interaction between mother and child which a) involved some use of materials, such as toys, etc., b) was not a book reading situation, and c) was one in which the mother's attention was focused exclusively upon the child. It was discovered, however, that any type of mother-child play was a relatively low frequency occurrence for nearly all of the mother-child pairs. Furthermore, play segments of the type described above almost never occurred in some children's homes. This finding becomes even more interesting when the expressive and referential groups are compared with regard to amount of time spent playing with their children. While it is not practical to determine precisely the amounts of time each of the 19

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[7] As stated earlier under Method, the first day of taping (tape one) was not used in the analysis of mother's communicative styles, since it was believed that the effects of the presence of the recording system on mothers' speech would be smaller on the second day (tapes two and three). It was the subjective impression of the experimenter that, in fact, only the first few minutes of tape one were influenced significantly by the presence of the recording system. The nature of the family interactions and communications on the remainder of the tapes was often personal and intimate, suggesting that subjects were reasonably natural in their interaction. In interviews following the taping, several parents reported that they tried to be aware of the recorder's presence, but were unable to. This is probably due to the fact that, in most cases, most of the recording equipment was not visible.

[8] In one tape a totally different activity-dressing-followed the mother's first mention of breakfast. In this case, the fifty utterances following her next mention of breakfast were used which was when the breakfast situation actually took place.

mothers spent playing with her child, it was possible to count the number of 30-unit recorder intervals[9] which contained mother-child play, and thus provide an estimate of the frequency with which this type of activity occurred. Table 4 contains the average number of occurrences for each group for tapes one and two. (Tape three could not be compared due to missing or poor quality tapes.) Any playful interaction with the child in which the mother's attention was focused exclusively upon the child was counted as play. Book reading segments were also considered a type of play, but were tallied separately. These numbers suggest substantial differences between the two groups of mothers in the amount of time spent in these kinds of activities.

TABLE 4
Average Number of 30-Unit Recorder Intervals
in which Play or Book Reading occurred

	PLAY		READING	
	Tape 1	Tape 2	Tape 1	Tape 2
REFERENTIAL GROUP MOTHERS	9.4	4.6	3.2	3.6
EXPRESSIVE GROUP MOTHERS	2.8	.8	.0	.0

Thus, in order to find play segments for the five expressive group mothers, it was necessary to redefine Play to include any kind

[9] It must be pointed out that the actual time required for a 30 counter unit interval on the recorder increases from the beginning to the end of the tape, with an approximate range of one-and-a-half to four minutes. The assumption here, of course, is that there is no difference between expressive and referential groups with regard to whether play segments occur at the beginning or end of a tape. This assumption has not been tested in the current study. At best, this measure offers only a crude estimate of time spent in mother-child play.

of playful interaction such as tickling, teasing, etc. Furthermore, in some situations it was not possible to find a play segment long enough to provide a fifty-utterance sample. When this was the case the remaining number of utterances which were needed to make a total of fifty were obtained from the next play segment which occurred on the tape. Nearly all segments for both Breakfast and Play were obtained from tape two. However, in two cases it was necessary to obtain the Play segment from tape three.

The actual data analyses for this part of the study were carried out on two 50 utterance samples for each of the ten subjects (five mothers of referential, and five of expressive children). A total of 20 measures (summarized in Figure 3) were performed on each 50-utterance sample. A 2 x 2 two-way analysis of variance (group by situation) with subjects repeated on the situation factor, was the statistical analysis used to evaluate differences between the communicative styles of the two groups of mothers, as well as the effects of situation upon communication, for each of the 20 measures.

Table 5 summarizes the results of the analysis of mothers' communicative styles. For most of the measures, the numbers on this table refer to the mean number of occurrences of the particular feature being measured which occurred in a 50-utterance sample. Because both the subject sample size and the linguistic sample size are very small, it was determined, a priori, that a significance level of .10 or better would be considered meaningful for the present study. As Winer (1971, p. 14) points out, "The frequent use of the .05 and .01 levels of significance is a matter of a convention having little scientific or logical basis." He goes on to state that higher levels

may be appropriate, particularly when power of tests is low under lower levels of significance and when type I and type II errors are of equal importance.

While the data from the current study do provide information regarding the nature of mother-child communication in general, this topic has been frequently discussed by other authors (See Snow, 1977 for review of this literature) and will not be considered in the present study. The focus of the current study is upon the differences in mother's speech to their children. These data are summarized in Table 5.

Group Comparisons

Table 5 summarizes the means for the two groups of mothers, for each measure, in two situations, Breakfast and Play. Each of these measures will be discussed below with regard to the differences between mothers of expressive and referential children.

Noun Pronoun Use. Examination of Table 5 indicates that while there is no support for the prediction that expressive group mothers would make greater use of Third Person Pronouns ($F(1,8) = .653$, $p > .10$) or Total Pronouns ($F(1,8) = 1.288$, $p > .10$) than would mothers of referential children, there is fairly consistent support for the notion that mothers of referential children do use more nouns than do mothers of expressive children. Mothers of referential children use more Noun Tokens ($F(1,8)$, $= 4.164$, $p = .07$), than mothers of expressive children. Furthermore, when Proper Nouns (names of people, etc.) are eliminated from the noun count leaving only Common Nouns, the differences are even greater for the two groups ($F(1,8) = 4.017$, $p = .08$, and $F(1,8) = 6.867$, $p = .03$ for Common Noun Types and

Measure	Definition
1. Mean Length of Utterance	This measure, often referred to as MLU, measures the average number of words per mother's utterance for a 50 utterance sample.
2. Noun types	The total number of different nouns used in 50-utterance sample.
3. Noun Tokens	The total number of nouns used in the sample. Thus, if the same noun is used 10 times, this represents one noun type and 10 noun tokens.
4. Noun Type/ Token Ratio	The ratio of total number of noun types to total noun tokens for a 50-utterance sample. The maximum type/token ratio is obviously 1.0 which would indicate that each different noun was used only once. Thus, the smaller this ratio is, the greater is the noun redundancy.
5. Third Person Pronouns	The total number of third person pronouns occurring in a 50-utterance sample. Third person pronouns include the following (as defined by Snow, 197): he, she, it, they, him, her, them, those, these, his, her, hers, its, their, theirs.
6. Total Pronouns	Total number of pronouns occurring within the 50-utterance sample.
7. Noun/Pronoun Ratio	This is actually computed as non tokens/noun tokens + total pronouns. Thus, as the number of pronouns, relative to nouns increases, the ratio becomes smaller.
8. Common Noun Types	This measure eliminates all proper nouns from the noun count above, and measures the number of different common nouns in the 50-utterance sample.
9. Common Noun Tokens	The total number of common nouns used in the 50-utterance sample.
10. Common Noun Type/ Token Ratio	The ratio of common noun types to common noun tokens (see no. 4 above).

Figure 3
Summary of measures used to evaluate Mothers' Communicative Styles

Measure		Definition
11.	Utterance Repetitions	The number of exact repetitions of an entire utterance, which occur within two utterances following its initial occurrence, in the 50-utterance sample.
12.	Partial Repetitions	The number of repetitions of a part of an utterance (consisting of a sequence of three or more words, which appears within two utterances following the original occurrence of the utterance) which occur in the 50-utterance sample.
13.	Noun Repetition	The number of times a noun is used again, either within the same utterance or in one of the next two utterances following the utterance in which the noun first occurred.
14.	Action Repetition	The number of times an action word is re-used, either within the same utterance or in one of the next two utterances following the utterance in which the action word first occurred.
15.	Modifier Repetition	The number of times a modifier is-re-used, either within the same utterance or in one of the next two utterances following the utterance in which the modifier first occurred.
16.	Yes/No Questions	The number of questions, in any form, to which a response of "yes" or "no" would be appropriate which occur in the 50 utterance sample. These include deleted auxiliary types (e.g. "Ya want some ice cream?") tag questions, (e.g., "You want some ice cream, don't you?"), rising intonation alone (e.g., "You do?") and the standard subject-auxiliary inversion (e.g. "Do you want some ice cream?")
17.	Long utterances	The total number of utterances of five words or more which occur in the 50-utterance sample.
18.	Single word utterances	The total number of utterances consisting of a single word which occur in the 50-utterance sample.

Figure 3 (continued)

Measure	Definition
19. Imitations	The number of times the mother imitates an utterance made by the child in the 50-utterance sample.
20. Commands & Prohibitions	The number of imperative sentences (e.g., "get down.") or prohibitions (e.g. "NO" or "You can't do that.") which occur in the 50-utterance sample.
21. Object References	The number of times the mother refers to an object, person, or animal which is present in the child's immediate environment. She may refer to the object without actually naming it, e.g., "put it down."

Figure 3 (continued)

TABLE 5
Mean scores for Mother's Communication Style Measures
By Group and Situation

MEASURES	Breakfast			Play			Statistics		
	R Mean	E Mean	R & E Combined	R Mean	E Mean	R & E Combined	Group F	Situation F	Interaction F
Mean Length of Utterance	3.7	3.2	(3.4)	3.4	2.9	(3.1)	2.172	1.585	.006
Noun Types	14.8	12.2	(13.5)	13.0	9.6	(11.3)	2.594	6.050**	.200
Noun Tokens	36.4	26.2	(31.3)	27.6	18.6	(23.1)	4.164*	9.852**	.053
Noun Type/ Token Ratio	.41	.47	(.44)	.48	.58	(.53)	4.043*	1.819	.114
Third Person Pronouns	4.4	5.6	5.0	8.2	4.2	6.2	.653	.613	2.877
Total Pronouns	33.6	26.6	(30.1)	32.4	25.0	(30.0)	1.288	.182	.004
Noun/Pronoun Ratio	.52	.50	(.51)	.48	.41	(.44)	.374	3.965*	.524
Common Noun Types	11.2	9.2	(10.2)	10.8	7.4	(9.1)	4.017*	1.669	.676

*p < .10
**p < .05
***p < .01

TABLE 5 (Continued)

MEASURES	Breakfast			Play			Statistics		
	R Mean	E Mean	R & E Combined	R Mean	E Mean	R & E Combined	Group F	Situation F	Interaction F
Common Noun Tokens	26.2	19.2	(22.7)	24.0	14.2	(19.1)	6.867**	1.501	.227
Common Noun Type/Token	.44	.52	(.48)	.46	.55	(.41)	3.962*	.080	.005
Utterance Repetitions	1.6	2.4	(2.0)	1.4	6.2	(3.8)	6.453**	4.349	5.369*
Partial Repetitions	3.8	3.8	(3.8)	2.0	1.6	(1.8)	.059	6.202**	.062
Noun Repetitions	9.6	7.4	(8.5)	10.8	5.8	(8.3)	2.284	.008	.415
Modifier Repetitions	2.2	2.4	(2.3)	1.8	1.2	(1.5)	.091	1.600	.400
Yes/No Questions	9.6	9.0	(9.3)	8.4	3.4	(5.9)	4.320*	3.477	1.456
Imitations	1.8	1.2	(1.5)	3.6	1.0	(2.3)	4.452*	1.076	1.681

*p < .10
**p < .05
***p < .01

TABLE 5 (Continued)

MEASURES	Breakfast			Play			Statistics		
	R Mean	E Mean	R & E Combined	R Mean	E Mean	R & E Combined	Group F	Situation F	Interaction F
Single Word Utterances	15.2	14.2	(14.7)	15.0	17.4	(16.2)	.080	.597	.767
Long Utterances	11.0	7.4	(9.2)	10.8	6.0	(8.4)	4.151*	.188	.106
Commands & Prohibitions	7.2	14.0	(10.7)	3.4	9.2	(6.3)	4.178*	4.488*	.061
Object References	25.4	21.6	(23.5)	33.4	14.8	(24.1)	79.64***	.029	4.386*

*p < .10
**p < .05
***p < .01

Common Noun Tokens respectively). There is also a significant difference in the Noun Type/Token Ratios of the two groups, ($F(1,8) = 4.043$, $p = .07$, and $F(1,8), = 3.962$, $p = .08$ for Noun Type/Token Ratio and Common Noun Type/Token Ratio respectively.) As discussed earlier, type/token ratio is a measure designed to reflect the degree of lexical redundancy. The smaller the ratio, the greater the redundancy, or, in this case, the noun redundancy. In both Breakfast and Play situations, the Noun Type/token ratios are significantly smaller for referential than expressive group mothers. In summary then, the results suggest that, with regard to noun use, mothers of referential children make greater use of nouns, especially common nouns, and that they use any given noun more often than do mothers of expressive children.

Repetitions. A significant difference was also found in the frequency of Utterance Repetitions, ($F(1,8) = 6.453$, $p = .03$). As Table 5 indicates, referential group mothers rarely repeated entire utterances in either the Breakfast or Play situation. (See earlier discussion of definition of Utterance Repetitions.) Mothers of expressive children were much more likely to repeat in this manner, particularly in the Play situation where the mean number of Utterance Repetitions in 50 utterances was 1.4 and 6.2 for referential and expressive mothers respectively. It is also interesting to note that there is a statistically significant interaction between group and situation for this measure ($F(1,8) = 5.369$, $p = .04$). While mothers of referential children used slightly fewer Utterance Repetitions in the Play situation than in the Breakfast situation, expressive group mothers used substantially more Utterance Repetitions in the Play situation.

Imitations and Yes/No Questions. Two measures used in this study

which are similar in that they both reflect the mother's efforts at initiating or maintaining conversation with her child are Yes/No Questions, and Imitations. Yes/No Questions require minimal linguistic response from the child and often make use of a rising terminal intonation contour which serves as an attention-getting device. Imitation of the child's utterances provides a simple way for the mother to respond to the child.

It can be seen from Table 5 that mothers of referential children used both these devices more than did mothers of expressive children ($F(1,8) = 4.320$, $p = .07$, $F(1,8) = 4.452$, $p = .06$) for Yes/No Questions and Imitations respectively. These differences are especially apparent in the Play situation where Yes/No Questions were used an average of 8.4 times by referential group mothers and only 3.4 times by expressive group mothers. Imitations were used an average of 3.6 times by referential group mothers and 1.0 times by expressive group mothers in the Play situation.

Utterances of Five Words or More. A significant difference which was in the opposite direction of that which had been predicted was in the use of long utterances of five or more words. It had been hypothesized that mothers of expressive children would produce longer utterances which might help explain the greater incidence of word-combination in the early language of expressive children. However, in both the Play and Breakfast situations, referential group mothers used significantly more long utterances than did mothers of expressive children. ($F(1,8) = 4.151$, $p = .07$)

Commands and Prohibitions. A significant difference was found in the frequency with which mothers used commands and prohibitions,

$F(1,8) = 4.178$, $p = .07$. As can be seen from Table 5, mothers of referential children used significantly fewer commands and prohibitions in both situations than did mothers of expressive children. It is also interesting to note that both expressive and referential group mothers used fewer commands and prohibitions in the Play than in the Breakfast situation.

Object References. The differences between the two groups in the use of object references were very large. Table 5 indicates that for both situations, mothers of referential children used references to objects more often than did mothers of expressive children, $F(1,8) = 79.644$, $p < .0005$). This difference was greater for the Play situation than for the Breakfast situation, with the means in the Play situation being 33.4 and 14.8 for referential and expressive group mothers respectively.

Non-significant Measures. Several measures produced no significant differences between groups. These included partial repetitions, action word repetitions, noun repetitions, noun types, mean length of utterance, pronouns, and noun/pronoun ratio.

Summary of Differences in Mothers' Communicative Styles

In summary it can be said there are several differences between the two groups of mothers. First, mothers of referential children were much more likely to make use of nouns in their communication with their child. Not only did they use more noun types, they also used any given noun more frequently (i.e. more noun tokens). This finding, no doubt, is closely related to the finding that mothers of referential children also use more object reference in their speech. This suggests that these mothers talked more about concrete, easily

referenced things in the environment than did mothers of expressive children.

Another significant difference found was in the use of whole utterance repetitions. Referential group mothers were less likely to repeat an entire utterance when communicating with their children.

Two measures which appear to be related to greater efforts at conversation maintenance on the part of referential mothers were a greater tendency to imitate the child and to elicit response from the child via yes/no questions. Expressive group mothers, on the other hand, were more likely to use commands and prohibitions than were mothers of referential children.

Finally, referential group mothers used more long utterances than did expressive group mothers. This is a finding which was in the opposite direction of that predicted.

Differences in Two Situations: Breakfast and Play

Situation effects were also found for a few of the measures just discussed. These included Noun Tokens, Noun Types, Noun/Pronoun Ratio, Utterance Repetitions, Partial Repetitions, and Commands and Prohibitions. Each of these will be discussed below. None of the remaining measures revealed significant differences between the two situations.

Noun, Pronoun Use. Significant differences between Breakfast and Play were found for Noun Types ($F(1,8) = 6.050$, $p = .03$), Noun Tokens ($F(1,8) = 9.852$, $p = .01$), and Noun/Pronoun Ratio ($F(1,8) = 3.965$, $p = .08$). As can be seen from Table 5 in the column labeled "Expressive and Referential Combined", the Breakfast situation elicited more Noun Types and more Noun Tokens than did the Play situation. No

difference was found in Noun/Type Token ratio, suggesting that mothers were not more redundant in the Play situation.

Another significant difference was in the Noun/Pronoun Ratio, which was smaller for the Play situation than for the Breakfast situation. Noun/Pronoun Ratio was calculated as follows: Nouns/(Nouns + Pronouns). Thus, an increase in nouns relative to pronouns results in a larger ratio. Here again, the results suggest greater relative noun use in the Breakfast situation. As can be seen from Table 5 however, this does not suggest an increase in pronoun use in the Play situation. Total number of pronouns does not change from one situation to the other. Rather, the numbers reflect the decrease in noun usage in the Play situation.

Repetitions. There was a significant difference in the use of Partial and whole Utterance Repetitions. Mothers used more whole Utterance Repetitions in the Play situation ($F(1,8) = 4.349$, $p = .07$), and more Partial Repetitions in the Breakfast situation ($F(1,8) = 6.202$, $p = .03$). It should, however, be noted that, for Utterance Repetitions, there was a significant interaction between group and situation, whereas expressive group mothers used substantially more whole Utterance Repetitions in the Play situation than in the Breakfast situation, referential group mothers used fewer. Thus, it can be concluded that referential mothers decrease the number of whole and partial repetitions while playing with their child. Expressive mothers also decrease their use of partial repetitions, but, unlike referential mothers, they increase their use of whole utterance repetitions in the Play situation.

Commands & Prohibitions. The Breakfast situation elicited

significantly more commands and prohibitions from mothers than did the Play situation. These kinds of utterances occurred an average of 10.7 times in the Breakfast situation as compared to 6.3 times in the Play situation, $F(1,8) = 4.488$, $p = .06$.

Object References. An interesting finding with regard to Object References was that a significant interaction exists for group and situation ($F(1,8) = 4.386$, $p = .07$). Referential mothers use more Object References in the Play situation than in the Breakfast situation (33.4 as compared to 25.4).[10] Expressive mothers use fewer object references in the Play situation than in the Breakfast situation (14.8 as compared to 21.6). Table 5 also shows that actually there is little difference between the two groups in the Breakfast situation, but a substantial difference in their use of Object References in the Play situation.

Summary of Situation Effects. The effects of situation upon mothers' communicative styles can be summarized briefly. Mothers tend to use fewer nouns in the Play situation. This is true with regard to the variety of nouns used (noun types) as well as the frequency of noun use (noun tokens). There is a tendency--for referential group mothers at least--to use fewer repetitions in the Play situation than in the Breakfast situation. (Expressive group mothers, however, use more repetitions of entire utterances in the Play situation.)

Both groups use significantly fewer commands and prohibitions in

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[10] It is interesting to note that this is a case where content and structure of mothers' language is different. While referential mothers make more references to things, in terms of what they choose to talk about in the Play situation as indicated above, they actually use fewer noun types and noun tokens, as discussed earlier.

Play than in Breakfast. Finally, there is a significant difference in the interaction between group and situation in the use of Object References. Whereas expressive mothers use fewer object references in the Play situation than in the Breakfast situation, referential group mothers use more object references in the Play than in the Breakfast situation.

DISCUSSION

The results of the current study suggest the following conclusions.

1. Nelson's "expressive-referential" distinction does appear to be a valid way of categorizing strategies of early lexical development in children. Furthermore, examination of children's early language use via the empirically derived Function categories revealed that referential and expressive children not only develop different types of vocabulary, but that this vocabulary is used in different ways, particularly with regard to labeling.

2. The communicative styles of mothers of referential and expressive children differ significantly in many ways. The difference which probably relates most directly to the child's selection of a referential or expressive strategy of early language development and use is the degree of referentiality in the mother's communication with her child. The concept of referentiality as it is used here refers both to language structure (noun use) and language content (object references). Several other differences were found in the communication styles of the two groups of mothers, including frequency of yes/no questions, imitations, repetitions, and commands and prohibitions.

3. Differences were also found in the frequency and types of play used by the two groups and in the educational background of the parents of expressive and referential children. Neither of these

was actually included as a research question at the time the study was originally proposed.

Each of the above findings will be discussed below. The discussion will first consider differences in children's early language use. Next, differences in communicative styles of mothers will be considered, including discussion of differences in the role of play in mother-child interaction in the two groups. Finally, the relationship between the present findings and previous research in the area of sociolinguistics will be considered.

Children's Communicative Styles

The results of the analyses of 19 children's first 50 words suggest that it is possible to use Nelson's categories of "expressive" and "referential" to characterize children's early communicative styles. The seven children identified as referential in the study did make greater use of General Nominals, used fewer different word categories, and were more aware of word boundaries than were those children identified as expressive. Expressive children used a greater variety of word types, including pronouns, function words, and action words, and were more likely to produce multi-word strings prior to the acquisition of 50 words.

More careful examination of children's early language use, via the empirically derived Function Categories, revealed that referential children were more likely to use language to label the things in their environment than were expressive children. Expressive children, on the other hand, were more likely than referential children to use language to accompany action, and to express negative attributes such as "dirty", and "stink". There was also evidence that, compared to

referential children, a greater proportion of the expressive children's first 50 words was used to manipulate and control their environments, as demonstrated by more words used as requests for attention, and greater use of the words "more" and "mine" as demands. Further support of this notion that expressive children were more apt to use language to control their environments was the fact that expressive children exceeded referential children in their use of words in all Request categories. Although a statistically significant difference was found only in the Request for Attention category, when all Request categories were combined the difference between the two groups approached significance, $t(17) = 1.71$, $p = .10$.

Informal observations throughout the course of the study also suggested this difference in language use. The following hypothetical dialogues[11] characterize this difference in use of language to control others.

Expressive Child

Child: "Please"

Mother: "What?"

Child: "juice"

Mother: "Oh you want some juice?" (hands child juice)

Child: Drinks juice.

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[11]Because children's speech and language at this age is so idiosyncratic, and often understood only by primary caretakers and siblings, it was impossible to make verbatim transcripts of children's utterances from the in-home tapes. Thus, hypothetical examples have been used, based upon the investigator's visits to the children's homes and her informal observations of mother-child interactions, and "on-the-spot" interpretations by mothers.

Referential Child

Child: points to cupboard

Mother: "What do you want?"

Child: points again

Mother: "Oh you want some juice?" (hands child juice)

Child: sees juice and says "juice," then points to picture on juice cup and says "duck!"

While the referential child made it clear that he wanted something, it was only upon actually receiving the object that he produced the word for the object. The expressive child, who would much less frequently name an object just to label it, quite readily used the object name when demanding it. Behaviorally, each child was equally effective in manipulating the evnironment. The difference lies in the extent to which language was used to that end.

As discussed earlier, several investigators— while not directly testing Nelson's hypotheses--have at least anecdotally referred to differences in children's early language strategies which seem to support Nelson's claims. The findings of the present study lend further support to the expressive-referential distinction. In addition, the study demonstrates that there is an important difference in language use between children whom Nelson would identify as expressive and referential, with referential children more likely to use language to label, and expressive children more likely to use language to get attention and manipulate the environment.

Mothers' Communicative Styles

The major question posed by this study was whether there is some systematic relationship between children's early language production

and mothers' styles of language interaction. The results presented here are strongly suggestive of a number of interesting relationships.

Referentiality. Perhaps the strongest relationship was that which was found to exist on what might be referred to as the "referentiality" dimension of both mothers' and children's language. Mothers of referential children not only consistently used more common nouns in their linguistic communications with their children, but they also used far more object references, i.e., they talked more about the "things" in the child's environment than did mothers of expressive children. Thus, it is no surprise that their children used a predominance of labels and names of things in their early language.[12]

Play. Another difference found between the two groups of mothers was in the frequency and types of play in which they engaged their children. Examination of the in-home tapes strongly suggests that mothers of expressive children played with their children much less frequently than did mothers of referential children. These differences will be discussed in more detail below.

It is interesting to note that several assumptions about the role of play in mother-child interaction in general were not supported by the findings of the current study. When all mothers were considered together, play did not provide a vehicle for language teaching, as

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[12]It is appealing to conclude that a high degree of referentiality in mothers' communicative styles causes the child to use a highly referential strategy in his/her early language development. However, the design of the current study does not allow verification of this hypothesis. The possibility must be at least considered that mothers merely respond to children in a highly referential way because the children display some sort of innate preference for such a language development strategy.

might have been predicted. When compared to the Breakfast situation, sentences were not shorter, nor was there greater use of single word utterances; language was neither more referential, nor more redundant; there were not fewer pronouns relative to nouns; there were not more repetitions of words and phrases; there were not more Yes/No questions or imitations of the child's utterances; and there were not more object references in Play than in the Breakfast situation.

It must be pointed out, however, that examination of the data in Table 5 suggests that there were important differences between the two groups of mothers in the extent to which the above statements were true. First, referential group mothers did use twice as many imitations, and significantly more object references in the Play situation than in the Breakfast situation. In most other categories, referential group mothers showed little change in their communicative styles from one situation to the other. Expressive group mothers, on the other hand, actually used significantly fewer object references in the Play situation than in the Breakfast situation. Also, they tended to use fewer common nouns in the Play situation (whereas referential group mothers used about the same number in both situations). Expressive group mothers also used substantially fewer yes/no questions in the Play than in the Breakfast situation (again, referential group mothers used about the same number of yes/no questions in the two situations).

Thus it can be concluded that when the Play situation is compared to the Breakfast situation, referential mothers made relatively few changes in their communication styles. The changes which were made do perhaps suggest somewhat greater efforts at language teaching

in the Play situation on the part of referential mothers. They made greater use of object references and imitations and used fewer commands and prohibitions.

Expressive group mothers displayed a different pattern of interaction in the Play situation. These mothers tended to be even less referential in the Play situation than in the Breakfast situation. Thus, the differences between expressive and referential mothers were actually magnified in the Play situation. This finding, together with the finding that referential group mothers engage in play more often than do expressive group mothers provides an appealing explanation for the greater referentiality in referential children's early vocabularies.

Thus, it seems clear here that some kind of relationship exists between children's early language development strategies and mothers' communicative styles. Given the small sample size, and the small corpus of utterances used for analysis, it must be inferred that there is a difference between the two groups of mothers which is very robust. Because the design of the study was essentially correlational, it is impossible to conclude unequivocally that the direction of this relationship was from mother to child. However, the next section in this discussion, which deals with differences in parent education level between the two groups, generates some interesting questions which may further explicate this relationship.

Parent Education Level

Another finding of the study was one which not only was not predicted, but also one which the study had not been intentionally designed to investigate. As mentioned earlier, a significant

relationship was found between Child's Communicative Style and the education level of the parents, with the most referential children having the most well-educated parents. It is interesting to note that Nelson (1973) reported that in her study all of the first born children of the most highly educated families were referential.

It is possible that education level reflects social class. Several studies have examined the relationships between mother-child interaction style and social class, (e.g., Bee, VanEgeren, Streissguth, Hyman and Leckie, 1969; Hess and Shipman, 1965; Olim, Hess and Shipman, 1967; Kagan, 1968; Freedle and Lewis, 1977; Snow, Arlman-Rupp, Hassing, Jobse, Joosten, and Vorster, 1976; Tulkin and Kagan, 1972; Tulkin and Cohler, 1973; Zegiob and Forehand, 1975b; Wooten, 1974), and the effects of social class upon children's language (e.g., Bernstein, 1960, 1964, 1970; Edwards, 1977; Johnston and Singleton, 1977; Williams, 1970, Jensen, 1968, Williams and Naremore, 1969; Rosch-Heider, 1971; Rosch 1977, Tough, 1974). It has been found that social class differences in mother-child vocal interaction exist in early infancy. Kagan (1968) for example, has reported a difference in the frequency of distinctive vocalizations used by middle and lower class mothers. That is, middle class mothers were more likely to talk or vocalize to their (female) infants in the absence of other input, such as touching, than were lower class mothers. Middle class mothers were also more likely to respond contingently to infant vocalizations than were lower class mothers. Freedle and Lewis (1977), in their study of mother-child vocalization dyads, found that low SES mothers were less likely to initiate vocalization with their infants than were high SES mothers.

Differences have also been reported in studies with older children. Middle class mothers have been found to be more verbal (Bee, et al., 1969; Wooten, 1974), and to use more questions and fewer imperatives to control children's behavior (Hess and Shipman, 1965; Olim, Hess and Shipman, 1967; Bee, et al., 1969; Bernstein, 1960, 1964, 1970; Wooten, 1974; Zegiob and Forehand, 1975; Snow et al., 1976) than did working class or lower class mothers. Snow et al. (1976) reported that middle class mothers used more substantive deixis and modal verbs, and used more expansions. Snow also found that middle class mothers used fewer exact or partial repetitions than did lower class mothers. Wooten (1974) also found that middle class mothers made more attempts to extend dialogue with their children, and made greater use of comments which were neither interrogative nor regulative, e.g., comments describing the parents own activities or intentions.

Some investigators have described socioeconomic status differences in the communication styles of children rather than mothers. Rosch (Rosch-Heider, 1971; Rosch, 1977) and Johnson and Singleton (1977) have found that, in a task requiring children to describe abstract figures, middle class children were more analytical and used more part-descriptive statements (e.g., "The top is pointed."). Working class children used more whole-inferential statements (e.g., "It looks sort of like a ladder"). Tough (1974) found that young working class children were more likely to use language to secure attention and to monitor their own actions.

Bernstein (e.g., 1960, 1964, 1970) has generated a number of controversial theories regarding the nature of social class differences

in language learning and use. He suggests that the underlying cause of the social class differences just reported is related to the effects of the structure of family relationships upon the form and function of language used in the home. He theorizes that middle class families are more "person oriented" while working class families are more "status oriented". In the middle class family, communality of social status is not assumed and the speaker is "forced to expand and elaborate meanings (Bernstein, 1964, p. 63)." Communication in the working class family, on the other hand, is dependent upon "shared assumptions" rather than "verbal elaboration of meaning" (Bernstein, 1964, p. 63)

Finally, Tulkin and Kagan, (1972) and Wooten (1974) have pointed out that there is a difference in child-rearing attitudes between lower and middle class parents. Whereas middle class parents tend to have the view that they can and should influence their child's development, lower class parents believe that the child's "natural talents will tend to emerge irrespective of the social world around him." (Wooten, 1974, p. 294)

It is clear from this brief review that social class differences in mother-child interaction are pervasive. They can be seen in early infancy and throughout childhood. There are indications that their effects on child language development are apparent in pre-schoolers, and continue to be more and more clearly defined. They may eventually be realized in the distinctly different communication strategies reported by Rosch, above.

It may be the case that several of the differences between mothers of referential and expressive children reported by this study

were related to the fact that referential children were from predominantly well-educated middle class families, while expressive children were more likely to be from less well-educated, working class families. Given the design of the current study, the referential and expressive categories were necessarily confounded with education level of parents. Since one of the independent variables was a subject selection variable (expressive and referential group mothers), the design is essentially correlational. Several of the differences found between mothers of expressive and referential children were traits which have been reported to be associated with social class, e.g. use of questions and imperatives.

The results of this study suggest, in addition, that referentiality in mothers--and, thus, the expressive-referential distinction in children--may be related to differences in parent education level.[13] These differences may, in turn, be (at least indirectly) related to social class as well. Rosch (1977) has pointed out that

> In actual fact, accounts of MC (middle class) and LC (lower class) verbal interactions outside of formal settings are largely imaginary extrapolations from limited data; there

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[13]Another possibility is that the referential-expressive difference was not actually in the children themselves, but rather in the parent's interpretation of children's utterances. The methodology employed, which relied solely upon mother's diary records, and the unintelligible nature of children's speech at this age made it impossible to verify the validity of the 50-word vocabularies. Thus it is possible, for example, that highly educated mothers were simply more likely to interpret children's utterances as general nominals than were less well-educated mothers. It was the investigator's strong impression, however, based upon bi-weekly observations of mothers and their children, that there were real differences among children, particularly in how language was used. (See earlier discussion of function categories.)

> have been few ecological studies of actual speech occurrence . . . in LC and MC homes (p. 149).

The current study may very well provide some preliminary insights into differences in naturalistic mother-child interactions in different social classes, to the extent that parent education level reflects social class.

Reports cited above (Tulkin & Kagan, 1972; Wooten, 1974) suggested that middle class parents view their child-rearing roles differently than do lower class parents. Middle class parents believe it is their responsibility to teach their children, and influence their development. The different communicative styles of expressive and referential group mothers in this study seem to reflect this difference in attitudes. The more highly educated mothers of referential children played with their children more, and were more verbally "explicit" in the sense that they provided specific labels for readily identified, concrete objects. There was often a one-to-one relationship between "words" and "things" in the child's environment. This could very well reflect mothers' greater efforts at teaching language to their children.

Wells, (1979) has criticized the investigation strategies of the field of sociolinguistics by stating that studies which begin by selecting a non-linguistic parameter such as socioeconomic status, and then attempt to explain the variations in language development on the basis of such a parameter, have not been successful. Adlam (1979) emphatically states that social class, per se, cannot explain anything.

Wells suggests that a better strategy would be to begin by

grouping children according to some linguistic variable, and then to "work outwards, through variation in their conversational experience, to the attributes of the families associated with different styles of caretaker-child interaction" (p. 407). This is just what has taken place (though not by original design) in the current study. Children were grouped according to degree of referentiality present in their early vocabularies. Differences between the naturalistic mother-child interactions were then examined via various measures obtained on samples of the mothers' child-directed language. Finally, the parent-education levels of the two groups were compared. For the very small sample used in the study, there were distinct differences in levels of education. A similar study should be done with a larger sample to further investigate the relationships between various "family attributes" and parent-child interaction styles.

Conclusions and Implications for Further Research

The results of this study do suggest that there is a relationship between children's early language acquisition strategies, and the communicative styles of mothers. While the direction of this relationship could not be scientifically verified through the study's research design, the preceding discussion suggests that, at least to some extent, the direction is from mother to child. It is quite possible that a mother's attitude toward child rearing in general, and her view of herself as "language teacher" in particular, influence the ways in which she interacts verbally with her child. There is a need for further research which directly investigates this possibility.

Research in the areas of sociolinguistics and mother-child language will, hopefully, merge in an effort to further explore ways in

which the linguistic environment interacts with the child's processes of language acquisition to produce variations in language use, content, and form. In addition, an issue raised in the introduction which has not been addressed by this discussion is the relationship of cognitive style to children's selection of an expressive or referential strategy of language acquisition. Bowerman (1978) reports a study by Rosenblatt (1975) in which referential children were found to engage more in playing with toys than did expressive children. As was stated earlier, Bowerman believes that there is evidence that the expressive-referential distinction is related to "genuine differences of cognitive style" (p. 360). Nelson (1971, 1973) also suggests that the expressive-referential distinction is related to cognitive style.

Just what is meant by "cognitive style" is not clearly defined. A good operational definition of "cognitive style" needs to be generated. It would then be possible to examine relationships between the interaction styles and child-rearing attitudes of parents, and individual differences in cognitive development. There are many interesting hypotheses that might be generated regarding the relationships among such variables as characteristics of the child's social and linguistic environment, cognitive style and early language acquisition strategies.

APPENDICES

APPENDIX A

LETTER TO MOTHERS

AND PHONE INTERVIEW DATA SHEET

Appendix A

Letter to Mothers and Phone Interview Data Sheet

Dear Parent,

Our language development laboratory, which is part of the Michigan State University Department of Psychology, has been studying how very young children learn to talk. We are particularly interested in the early speech of children between the ages of twelve and eighteen months. If your child is in this age range, and is an only child, we would like you to consider being part of our study.

There are two main parts to our study. First, you will be asked to keep a record of the first 50 words your child learns. A printed copy of this record will be yours to keep. Second, we would like to make tape recordings of you and your child during a typical day in your own home in order to learn more about what kind of communication takes place routinely between parents and young children. Later, we may also ask to involve your child in a series of play sessions in order to observe how your child learns new words. We will keep all information gathered in the course of the study confidential, and we will be happy to share results of all aspects of the study with you.

If you are interested in participating in this study and would like more information regarding the project, please call Diane Klein (394-3647). We have found the study of early child language to be fascinating, and we think both you and your child will find the experience to be interesting and enjoyable.

Sincerely,

M. Diane Klein, M.A.
Doctoral Candidate

Helen Benedict, Ph.D.
Assistant Professor of Psychology

Name:_____

PHONE INTERVIEW FOR SUBJECT SELECTION

FAMILY INCOME: 9,500 or less _____
9,500 - 12,500 _____
12,500 - 17,500 _____
17,500 - 20,000 _____
20,000 or more _____

EDUCATION:
Mother: HS _____
College _____ # years: _____
Father:
HS _____
College _____ # years: _____

OCCUPATION:
Mother: _____ # hours/wk: _____
Father: _____

SIBLINGS: _____

SEX: _____

APPROX # WORDS CURRENTLY: _____

NORMAL PREGNANCY & DELIVERY: YES _____ NO _____

DEVELOPMENTAL PROBLEMS: _____

RACE: Black _____ Chicano ____ White _____ Other _____

LANGUAGES SPOKEN OTHER THAN ENGLISH: _____

DO YOU EXPECT TO BE LIVING IN THE LANSING AREA FOR THE NEXT YEAR?

APPENDIX B

DIARY PROCEDURES

Appendix B

INSTRUCTIONS FOR LANGUAGE ACQUISITION DIARIES

Date--Record date when your child uses a new word.

Word--Try to note down as accurately as you can what you understand your child to have said. We would like to list both what the child said, as well as what you think it means. For example, your child may say "woof" and point to the dog, leading you to conclude that "woof" means "dog" to him. In such a case, we would like you to record both your child's actual word and your translation.

Situation--Here again we would like to know what is going on when your child uses a word. We're especially interested in what your child does when he speaks, e.g. does he point to something (like a person, a picture, or a toy); or engage in an action (throw a ball, bounce up and down, climb on something); or perform a gesture (waving bye bye, clapping hands, etc.). Another part of the situation we would like you to record is what was happening when the child used this word, e.g. did someone leave the room, did you ask him a question, etc.

Imitation or spontaneous--When children are first learning words, sometimes they imitate or copy words after they hear them and other times they say words spontaneously. We would like you to try to decide when your child's words are said spontaneously and when he is imitating something he has just heard. A word would be marked "imitation" whenever your child says a word that you (or someone else) has just said. Any word that your child says without having heard someone else say it just before him would be marked "spontaneous." For example, if you said "say bye-bye" and then your child says it, that would be imitation. If he says "bye-bye" when he sees someone leave, without hearing anyone else say it first, then you would mark "spontaneous."

Object present or absent--If your child refers to an object, e.g. "doll," we would like you to record whether the object is present or absent when your child uses the word.

DAILY LANGUAGE ACQUISITION RECORD

Child's name: _____

Date	Word	Situation	I/S	Object P/A

APPENDIX C

ACTIVITY SUMMARY SHEET

AND

IN-HOME RECORDING PROCEDURES

Appendix C

Activity Summary Sheet

Name_____ Day #_____

Morning	Adults	Child
7:00		
8:00		
9:00		
10:00		
11:00		
Afternoon 12:00		
1:00		
2:00		
3:00		
4:00		
Evening 5:00		
6:00		
7:00		
8:00		
9:00		
10:00		

IN-HOME RECORDING PROCEDURES

DAY I.

As soon as your child awakens in the morning, start the tape:

1. Turn tape recorder on (light will come on).
2. Simultaneously depress "start" and "record" buttons.
3. Close wooden recorder box.
4. Let this tape run all day (except for those periods when you wish to have the recorder off).

At the end of Day I, rewind Tape #1:

5. Push left-hand rewind button.
6. Replace this tape in box.
7. Set up Tape #2.

Day II.

As soon as your child awakens in the morning, start the tape, using the same procedure as 1 - 3 above. Just before lunch time, do the following:

1. Rewind Tape #2. (Push left-hand re-wind button)
2. Set up tape #3.
3. Remove Akustomat.
4. Start Tape #3 (Push "start" and "record" buttons).
5. Close wooden cover.
6. Let tape run for remainder of day.

Please fill out the Activities Summary sheet for both days.

If you have any questions or problems, please call me (394-3647)

APPENDIX D

TRANSCRIPTION PROCEDURES

Appendix D

TRANSCRIPTION PROCEDURES

I. Fill out bottom of data sheet.

The back of the tape box will provide the following information:
Child's name
Child's age
Tape #
Date

II. Start tape.

A. Attach white leader tape to take-up reel.

B. Wind tape until beginning of brown magnetic tape is parallel with corner spindle

C. Set recorder counter at 0000.

D. At the beginning of each new page of transcription, record recorder # (the number on the counter) on the bottom of the data sheet.

III. Transcription procedures.

A. Headphones should be plugged into recorder at "Loudspeaker/ Earphone."

B. Footswitch is attached at "Micro/Remote."

C. The volume and tone controls on the left side of the recorder control the quality of the tape playback. When speech is unintelligible, adjustment of these controls may be helpful.

D. In speech by persons other than the child, transcribe only those utterances addressed to the child.

E. Transcribe all child utterances (see also #K).

F. Record only one utterance per line. An adult utterance and a child utterance should not occur on the same line unless they are spoken simultaneously.

G. If the adult speaker is someone other than the mother, identify in the "speaker" column as F (father), OF (other female), OM (other male), or C (other child).

H. Only one utterance should be written on a line. In adult speech, an "utterance" will quite often be a short sentence, e.g. "Give it to me." "What's the matter?" "See the dog?" However, it may be a single word, e.g. "What?" a sentence fragment, e.g. "in there?" or more than one sentence, e.g., "Come here, now put it back." A single utterance which contains more than one sentence is usually identifiable by an obvious absence of any pause between sentences. Many times they take the form of complex sentences with a conjunction deleted e.g. "Don't go outside it's too cold!" ("because" is deleted).

Words such as "oh," "Look," and the child's name are often used at the beginning of an utterance to direct the child's attention. In most cases such words will be considered part of the utterance. In some cases, however, these words are used in isolation or are set off from the main utterance by a major pause, and should be recorded as a separate utterance.

I. Parts of the recording will be unintelligible. If there is a single word which is unintelligible, leave an underlined blank in the sentence, e.g. "Put your _____ back in the toybox." If an entire phrase or utterance is unintelligible use a question mark, e.g. "If you don't come here, I'll ? ." Thus, if a blank appears, it means you are reasonably certain that the untranscribable portion is a single word. A question mark indicates the untranscribable portion is longer than a single word.

J. A word in an utterance which is obviously stressed or emphasized by the speaker should be underlined. E.g. "No, not the car, the ball."

K. In most cases, the child's utterances will not be transcribable. When this is the case, use the following to describe the child's utterances.

1. "Cry" if child is clearly upset and crying.

2. "Whine" Whining is usually shorter in duration, is not as loud, and often has a nagging quality.

3. "Jargon" Child uses unintelligible sound strings with sentence-like intonation.

4. " ? " When child has said something which approximates real speech, but it is unintelligible. These will rarely be longer than 3-4 syllables and are typically

much shorter utterances than jargon.

L. Whenever possible, attempt to identify the situation or activity in the far left-hand column of the data sheet. The Activity Summary sheet with each tape should be of some help here. In addition, many environmental sounds will be identifiable, e.g., sliding chairs, something dropped, food frying, rattling dishes, water running, etc.

M. Use a pencil for all transcription.

N. When there are periods of ten seconds or more in which there are no child-directed or child-produced utterances, these must be recorded in the following way:

1. If the period is greater than 10 seconds but less than one minute, place a wavy line below the utterance which occurred just prior to the time period.

2. If the period is greater than one minute, draw a red line under the utterance which occurred just prior to the time period, and record the total number of minutes just above the red line in the far left coding column, marked "pause." (See sample data sheet).

O. Following each ten pages of transcription, go back and listen to that segment of tape again. Correct any error which have been made.

P. It is extremely important that transcriptions be exact. "What ya trying' to do" should not be transcribed as "What are you trying to do?" "Ya get done?" is not "Did you get done?" and so-on. If the utterance is unintelligible, don't guess.

Q. As you transcribe, not the counter numbers for the following events on a separate sheet of paper:

Breakfast
Diapering
Playing with child
Reading book to child
Father
Bedtime

SAMPLE DATA SHEET

Situation or Identifiable Sound	pause	speaker	Adult Utterance	Child Utterance
BREAKFAST			Are you hungry?	
Spoon drops			Huh?	
				cries
			Mom'll get it, ok?	
				?
			There	
			There	
				Juice
	5 minutes		Ya want some juice?	
refrigerator door opening/closing			There	

Name Jane Smith Age 16 mo Tape # 2 Recorder # 0015 Page 2

APPENDIX E

CODING PROCEDURES FOR MOTHER'S COMMUNICATIVE STYLE MEASURES

Appendix E

Procedures for Mother's Communicative Style Measures

1. Total # Words.
   Count all the words in the 50-utterance sample.
   -Contractions count as one word, e.g., I'll, c'mon, etc.
   -Reduplicated social expressions are counted as two words, e.g., bye bye, night night, etc.
   -"peek-a-boo" is one word.

2. Mean Length of Utterance.
   Total number of words divided by 50. Round to nearest hundredth.

3. Noun Types.
   Count each different noun used in the sample.
   -Suffixes such as "s" and "'s" are ignored. Thus, the following examples are each considered to be the same word.
   dog=dogs=doggie
   mom=mom's=mommie
   Chris=Chrissy
   Etc.

4. Noun Tokens.
   Tally the number of times each difference noun occurs in the sample and obtain a total number of nouns for each sample.

5. Noun Type/Token Ratio.
   Divide the number of noun types by the number of noun tokens for the 50-word sample. Round to nearest hundredth.

6. Third Person Pronouns.
   Count the total number of occurrences of any of the following pronouns: He, she, it, they, him, her, them, those, these, his, her, hers, its, their, theirs.

7. Total Pronouns.
   Count the total number of pronouns which occur in the 50-utterance sample. This includes all pronouns except relative and interrogative pronouns, such as "who", "Which," "What", etc. Indefinite pronouns, such as "one" and "someone" are counted.

8. Noun/Pronoun Ratio.
   Divide the total number of noun tokens in each 50-utterance sample by the total number of pronouns.

9. Utterance Repetitions.
   Count the number of times an utterance is repeated exactly

as one of the succeeding two utterances. For example:

"Get me the ball"
"Amy"
"Get me the ball." (utterance repetition)

10. Partial Repetitions.

Count the number of times a part of an utterance (i.e., phrase of two or more words) is repeated in one of the next 2 utterances. For example:

"Get me the ball."
"Amy"
"The ball." (Partial repetition)

11. Noun Repetitions.

Count the number of times a noun is repeated in one of the immediately following two utterances. For example:

"Do you want your doll?"
"Do you want it?"
"Where's your doll (noun repetition)?"
or
"Put the bear in your toy box."
"The bear goes in your toy box." (two noun repetitions)

-Note: Use of the child's name to get attention is not considered a noun repetition. For example:

"Amy, get your ball."
"Amy, get it."

12. Modifier Repetitions.

Count the number of times a modifier is repeated in one of the immediately following two utterances. For example:

"It's the big ball."
"The big (modifier repetition) one."
"See how big (modifier repetition) it is."

*13. Yes/No Questions.

Count the total number of utterances which are intended to elicit a "yes" or "no" response from the child. This also includes tag questions and utterances which use rising intonation along. The following examples are all considered Yes/No Questions.

"Do you want the ball?"
"Want the ball?"
"The ball's in the box?"
"Huh?"
"Okay?"

14. Single Word Utterances.

Count the total number of one-word utterances which occur in the sample.

15. Long Utterances.

Count the number of utterances in the sample which contain more than five words.

*16. Imitations.

Count the number of times the utterance is an imitatio of the child's utterance.

17. Commands/Prohibitions.

Count the number of imperatives (e.g., "Put that back," "Get me the car.") and prohibitions (e.g., "No, you can't do that.") A sentence which is intended as a command but which is grammatically not an imperative is not counted as a command (e.g., "Can you shut the door.")

22. Object Reference.

Count the number of utterances which refer to a concrete object, person, or animal. The utterance need not actually label the object. For example, "Can you get that?", or "Look at it." are considered referential, as well as those which are more obvious, such as "You have the ball," "The blanket is soft," etc.

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*These categories must be determined from the tape recording, and not from the transcript.

APPENDIX F

THE FIRST 50-WORD VOCABULARY FOR EACH OF THE 19 SUBJECTS

Appendix F

First 50 Words of All Nineteen Subjects

Subject 1	push	kiss	helping	bittycat
kitt	poop	socks	thankyou	cake
doggie	hat	blocks	heavy	car
ball	Rogers	bump	water	boat
light	keys	keys	pretty	booboo
car	cookies	toes	beebop	ring
fish		stuck	nose	muppets
bottle	Subject 2	ride	peaches	bus
broom	ohoh	glasses	towel	pop
shoes	Papa	teeth	bus	bubble
cheese	dog	peek-a-boo	flower	monkey
Daddy	ball	bath	up	clock
hot	hot	duck	Carrie	move
crackers	hat		berries	bye
what	car	Subject 3	blocks	Holly
this	fish	mama	packback	tickle
brush	hello	out	bib	cracker
sock	roundround	book	down	cotton
gone	owl	cookie	walk	cup
tree	bottle	bike	pillow	water
glasses	whoa	kitty		flower
chick	woof	juice	Subject 4	soap
Buda	cheese	eyes	Mom	go
down	chair	Dee	Daddy	away
apple	cold	bye	Christine	me
truck	bug	Pipi	bowwow	too
owl	pool	apple	hot	cards
bone	flower	banana	bird	
nose	cat	blanket	ball	Subject 5
cow	no	ball	hi	Mama
sharp	walk	off	Dee	Daddy
book	cup	mine	bra	ball
poke	book	belly	boot	byebye
hi	cookie	meow	boy	airplane
ruff ruff	byebye	strawberries	girl	balloon
watch	bird	shoes	coffee	puppy
Mommie	light	house	darts	hot
bird	Mama	dog	light	car
bus	bike	bird	diaper	hi
moon	spoon	baby	thankyou	bath
milk	banana	peek-a-boo	here	ohoh
raisins	thankyou	keys	bowling	banana
baby	Brian	rice	outside	cracker
duck	bowl	hi	eye	gum
stuck	eye	toes	balloon	flower

bear
kittycat
baby
drink
Bambi
that
overthere
thankyou
eye
see
pretty
water
boob
Peter
pin
spoon
mouse
snow
more
eat
cold
teeth
tickletickle
milk
key
pop
apple
book
yucko
moose
Ho-ho-ho
go
plug

Subject 6

see
here
rock rock
hot
peek
piggy
belly button
alldone
tree
bird
oh
boom
car
Grandpa
doggie
kitty
Mama
Daddy

hi
Moose
baby
cow
moo
clock
flower
dirty
Mandy
eye
shoe
truck
cookie
ohoh
house
ball
bye
knee
girl
get
down
duck
glasses
apple
ticktock
juice
nose
pass
ear
key
crackers
light

Subject 7

Daddy
Mommy
ball
bow wow
baby
squirrel
dog
bird
Brie
bike
bye bye
hot
drink
more
Papa
kitty
no
teeth
Amy

nite nite
Pete
eye
dollie
bath
Tee
Tom
down
boy
shoe
flower
water
dunno
okay
boom
ducks
uh uh
two
choo choo
hair
nose
plane
ouch
toe
rain
boat
horsie
balloon
Sherrie
cow
outside

Subject 8

Mama
Daddy
shoes
toes
cheese
doggie
Schlitzy
shut up
stop
pretty
ball
there
cracker
hat
cookie
diaper
eyes
yay
book
block

alldone
two
cocka
out
teeth
see
hot
car
ouch
Tom
hi
toast
airplane
hello
nunu
bird
chair
socks
door
oh oh
bath
booboo
juice
she
is
peach
baby
apple
up
bye

Subject 9

hi
there
book
oh oh
hot
turtle
get
down
mole
bye
Dad
water
ball
dirty
dial
moo
duck
quack
whoo
meow
dog

arf arf
bear
hello
yuk
Mama
Tina
egg
nose
eye
butt
no
rock
thankyou
this
button
banana
Niki
pop
key
cookie
shoe
Mandy
monkey
birdie
allgone
baby
toes
cheese
dirt

Subject 10

da
duck
book
baabaa
dog
tea
plug
daddy
what
this
bird
eeee
puff
look
pin
rumrrum
oomoom
cow
mama
oohoohooh
stop
up

back
more
shark
apple
coke
onetwo
bark
moo
bokbok
water
ABC
cookie
bus
bacon
kitty
down
basement
diaper
cowboy
shampoo
guitar
foot
porkchop
cycle
Gordon
fox
flush
wet

Subject 11

kitty
doll
frog
whee
Ali
Mommie
down
dog
thankyou
ball
oh oh
bye bye
pig
banana
hi
telephone
mine
shoe
boom
yeah
Don
papa
outside

bread
uh uh
socks
puppies
baby
Grandma
more
swing
water
book
foot
nonono
Mary
potty
allgone
eyes
where's
push
Ricky
bike
ride
milk
see
sitdown
nose
want
PC

Subject 12

thank you
please
Dad
Mama
woof woof
ball
bye bye
nurse
hot
grandma
puppy
uhuh
apple
grandpa
oh oh
mine
juice
hi
oh boy
baby
dog
horse
allgone
my

rock-a-bye
pineapple
I
eat
cookie
outside
ear
truck
no
spoon
keys
balloon
out
Tigger
BeepBeep
shoe
copter
down
Sue
water
tea
choo choo
door
ow
more
potty

Subject 13

mine
byebye
hi
Mommy
Daddy
Amy
Grandma
cookie
doggie
cracker
ball
bananas
apple
no
ohoh
car
nite
more
cheese
flower
hot
tractor
truck
keys
Sadie

go
outside
whoa
tree
see
later
potty
allgone
toast
Tricia
soccer
milk
peach
Marti
Willie
Lori
teeth
water
horse
drink
c'mere
kitty
up
there
Jurgen

Subject 14

Mama
Daddy
see
no
arf arf
oh oh
mmmm
bye
ball
bottle
hi
that
doin
aw
yes
down
blanket
nose
eyes
boo
meow
who
moo
dog
outside
cheese

shoes
alldone
mine
baby
Jesus
toes
da
cookie
door
water
brrr
toot
hot
hey
rockrock
clock
quack
car
listen
banana
juice
don't
key
cold

Subject 15

hi
Arrow
Daddy
Mama
is
it
no
that
hot
dog
ow
done
down
ear
eye
up
oh oh
Santa
wow
pretty
tree
plane
mouth
milk
jump
ball
nose

bye
hello
juice
hair
go
stop
cookie
ride
book
car
truck
outside
bear
Papa
bite
I
wanna
schoolbus
what
picture
thankyou
birds
Oscar

Subject 16

bow wow
Mommie
arf arf
mmmm
yes
no
Scottie
baby
bird
quack quack
pop
Schatzie
airplane
um
whats
that
Ria
Daddy
cracker
moo
byebye
Pooh
cluckcluck
tractor
fish
clock
shoes
mine

one two three
oh oh
apple
Staci
hi
the
nonono
ice
hot
Matt
hello
potty
up
rock rock
pretty
more
meat
get
down
cheese
Ronni
raisins

Subject 17

bye bye
seeya
hi
Jake
Daddy
Mama
hot
oh oh
up
here
there
nice
allgone
I
love
y'are
help
me
kitty
Susie
uhuh
Grandpa
Sissy
Katie
nite nite
shoes
fire
apple
banana

go
car
pee pee
Amy
don't
no
dog
ruff ruff
meow
ball
sock
where
orange juice
down
mine
juice
hello
water
cracker
hot dog
naughty

Subject 18

Daddy
Mommy
bye
yes
no
Bub
I
come
Amy
damn
here
hi
baby
eye
Art
Barb
more
tickle
mine
outside
Trina
bath
car
Danny
hot
Chrissy
ear
Grandma
uhuh
Lee

yuk
doggie
kitty
stink
thankyou
allgone
ka
hair
oh yeah
puppy
Mert
lights
Santa
cookie
cracker
nite nite
bull
Angie
Jennie
Grandpa

Subject 19

bottle
mmmmm
talk
hot
book
boom
Mommy
byebye
Daddy
baby
Vicki
Bobbie
huh
pretty
hi
keys
rock rock
oh oh
where
is
it
poop
sit
down
bath
horsey
boogie
call
yay
potty
ball

Robin
burger
walk
no
dog
ride
nite nite
minute
owie
Bridgette
what
allgone
hat
I
don't
know
write
good
thankyou

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