Longtin, Susan

THE RELATIONSHIP BETWEEN FUNCTIONAL ORIENTATION AND EARLY LEXICAL DEVELOPMENT

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THE RELATIONSHIP BETWEEN FUNCTIONAL ORIENTATION AND EARLY LEXICAL DEVELOPMENT

by

SUSAN LONGTIN

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7/27/84
date

Margaret Lahey
Chairman of Examining Committee

7/31/84
date

Executive Officer

Margaret Lahey

Louis J. Gerstman

Katherine Nelson
Supervisory Committee

The City University of New York

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CHAPTER I

INTRODUCTION

The child's first use of language is perhaps the most remarkable of all developmental achievements for it is this uniquely human capacity which sets man apart from all other species. One of the earliest ontogenetic manifestations of man's ability as animal symbolicum, to use the philosopher Cassirer's (1944) term, is the onset of lexical development in the young child. Although it is difficult, and perhaps arbitrary, to specify exactly when this milestone is attained, it is known from studies of child language development that this event typically commences sometime around the beginning of the second year of life.

Within the field of child language, the study of early lexical development has been approached from several perspectives. There have been studies of the similarities and differences between first words understood and those spoken (Benedict, 1979; Snyder, Bates & Bretherton, 1981) and there has been an exploration of the asymmetry between the meanings words have for young children as compared with adults (Clark, 1973; Nelson, 1974; Rescorla, 1980). An additional concern has been the makeup of early vocabularies in terms of the types of words that are learned. It has been reported that the number of different types of words children learn vary among children (Nelson, 1973) and that different types of words are produced more frequently in naturalistic contexts at different

developmental points within this early stage (Bloom, 1973). Although there are many descriptions of words acquired in early lexical development, the factors which influence the development of various patterns of early vocabulary acquisition are still not understood.

Several factors could account for the variety and change in types of words acquired in the period of early lexical development. These include the communicative function of the child's utterance, the type of language the child is exposed to, level of cognitive development, and phonological preferences or avoidances. The primary purpose of this dissertation was to examine the relationship of communicative function to the type of early words the child learns in the one-word period of language development.

CHAPTER II

REVIEW OF LITERATURE

Recent views of the nature of language hold that language is a system composed of interrelated syntactic, phonological, semantic, and pragmatic components. This current emphasis on synergy may be viewed as the culmination of trends in research that have taken place over the past three decades in the related fields of language, language development, and language disorders. When viewed from an historical perspective, one can trace a shift in focus of primary research concerns. In the sixties, there was an emphasis on the structural or formal aspects of language; in the early seventies an interest in the area of semantics and in the late seventies a proliferation of research endeavors in pragmatic areas including studies of how language is used. The earlier research on language form, content, and use have laid the necessary groundwork for studies in the eighties which have now begun to examine the interrelationships among the aspects of language.

This development was presaged by Bloom's keynote address to the Stanford Child Language Research Forum in 1976. In that address Bloom stated that "learning language is a synergistic process . . . meaning that the child learns about different aspects of language together " (Bloom, 1976, p. 1). The view that language acquisition is an integrative process which "proceeds horizontally

with multiple aspects of the language system involved together in what the child knows and is learning" (Ibid., p. 13) is reflected in some of the child language research of the past ten years. For example, Menn (1971) and Ferguson & Farwell (1975) studied the interactions between lexical acquisition and phonological development. Bloom, Miller, & Hood (1975) studied the synergy between the semantic and syntactic components of language in the development of early word combinations. Interactions between the semantic and syntactic aspects of language were also reported with respect to the emergence of verb inflections (Bloom, Lifter, & Hafitz, 1980). What these studies have in common is the focus on interactions between at least two components of the linguistic system. Waterson (1978) also advocates research which explores more than one component of language at a time. She believes that to get a fuller understanding of the process of development, at least two aspects of growth should be studied simultaneously. Because no single research endeavor can thoroughly investigate all the theoretically important components and their interactions, "reports covering only some of the aspects will continue to make a contribution" (Waterson, 1978, p. 115).

The major thrust of the proposed dissertation is to investigate the interrelationship between one component of language, function, and another, form, in the period of early language development when the child is acquiring first words. Although the term "function" has varied applications in the study of language (Francis, 1979), it is used here to refer to the purposes for which language is used by the child. The study of the functions of language is a major area of concern of pragmatics, the study of language in context

(Bates, 1976).

Variation in Lexical Development

Variation in early lexical development has been reported in the child language literature. Bloom (1973) found that frequency of use of two word types, substantive words and relational words, varied at different developmental points in the one-word stage in her daughter, Allison. Relational words dominated early in the one-word stage and substantive forms dominated later. Bloom speculated that the learning of object names was dependent on the child's cognitive level, a point to be returned to later.

A major study of children's early vocabulary development was Nelson's (1973) investigation of 18 children's first 50 words. Nelson classified the lexical items of each child's vocabulary into the following categories: specific nominals, general nominals, action words, modifiers, personal-social, and function words. In analyzing the vocabulary data for individual children, differences in the distribution of words across the above categories emerged. Nelson classified subjects as belonging to either one of two designations based on the percent of general nominals (common nouns and pronouns) that appeared among their first 50 words. Specifically, children were considered referential if more than 50% of their first 50 words were general nominals and expressive if fewer than 50% of their first 50 words belonged to that category. Frequency of use was not considered.

Leonard, Schwartz, Morris & Chapman (1981) found that this referential-expressive distinction was predictive of children's

ability to acquire new object names. Eight referential and eight expressive children were selected based on the number of different general nominals they used in a 100 utterance language sample supplemented by parental interview. The children, who had between 20 and 50 words in their expressive vocabularies, were trained on 16 low frequency words not in their repertoires. Half of the words were names for objects (e.g., "badge") and half were names for actions (e.g., "kneel"). The results indicated that in a posttest following ten training sessions, the referential children had learned a greater number of object words than the expressive children. The referential and expressive children did not differ in the number of action words learned. In discussing this result, the authors suggested that the referential children's object word performance did not seem attributable to superior word learning ability and mentioned some alternative explanations for the difference such as maternal influences originating before their study was conducted.

Nelson hypothesized that the lexical style difference between referential and expressive children may be related to what the child views the function of language to be. According to Nelson, the referential designation implies "a largely object-oriented language" (1973, p. 22) and the expressive designation implies "a more self-oriented language" (Ibid.). Thus, she suggests that referential children may view language as a tool for reference whereas expressive children may view language as a tool for social interaction. Nelson seems to be suggesting that the functions for which the child uses language are related to the makeup of the child's early lexicon. The claim is not that the two are necessarily causally related, but that

there is an interaction between the forms the child acquires and the functions for which they are used. Indeed, it seems likely that a child who views language as a tool for reference will acquire a substantial repertoire of object names. On the other hand, a child who views language as a means of interpersonal communication may, in the beginning stage of learning to talk, acquire the names of fewer objects but know and/or use more words of a personal-social nature. Nelson's finding that expressive children had a larger percentage of personal-social words in their vocabularies than did referential children supports this claim.

Conversely, one can make the case against a strong form/function interaction during this stage of language acquisition. For example, words other than general nominals (e.g., adjective modifiers and other relational words such as "more" and "allgone") can be used referentially. Bloom's (1973) data on Allison contains examples of this. For example, Allison used "more" to refer to a second instance of a shoe after referring to a first exemplar of a shoe. It is also the case that nominal forms can be used for non-referential functions. For example, Dore's (1975) category "request for object" which is isomorphic with Halliday's (1975) instrumental function could be coded with a general nominal form although they involve interpersonal communication.

Dore (in preparation) postulates four phases of lexical development which include descriptions of aspects of both the form and function of early, meaningful utterances. The sequence and description of the phases was derived from an analysis of the uses (in speech act terms) and forms which his son produced during the

so-called one-word period. Dore reported that his son stressed interpersonal uses earlier and referential ones later. Not until the last Referential Phase when Dore's son was 20 months old did he begin "to label people and objects without apparent affect or attempting to accomplish an interpersonal act" (Ibid., p. 74). During this same phase of development, Dore also observed an expansion of his son's lexicon. This spurt in vocabulary growth has been reported by others.

For example, Bloom reports that "at about 17 months Allison began to use many more substantive words that referred to objects and events. . . . Such words appeared to occur with no other function than to name or point out objects or persons" (1973, pp. 101-02). This observation seems consistent with more object oriented uses of language later in the single word period. Perhaps this reflects a pattern of individual variation in that some children may emphasize object oriented functions later whereas other children may use more personal-social functions.

Nelson (1973) found that for the majority of her subjects the usual course of vocabulary acquisition was characterized by "a slowly accelerating pace with a strong positive increase at the end. . . . However, there were a small number who never exhibited this marked acceleration, and there were a few who omitted the slow period of growth, beginning with the rapid acquisition phase" (1973, p. 36). Thus, there were differences in rate of acquisition as well as in types of words acquired. To date, there have been few studies of the possible variation in functions that might relate to differences in lexical development.

Snyder, Bates, & Bretherton (1981) studied the makeup and size of the comprehension and production vocabularies of a group of 32 thirteen month old children. Snyder et al. found that in both comprehension and production "vocabulary size was correlated significantly with a high proportion of common nouns" (Ibid., p. 579). They interpret this result as indicative of an early referential style in that some children may discover the concept of reference earlier than others (e.g., Dore reported this development at 20 months in his son). The Snyder et al. notion of early referentiality is consistent with the possibility of a referential, object oriented entry into language for some children. However, only direct examination of the functions that are used at different developmental points within the one-word stage would resolve this controversy.

Interaction between Form and Function

The child language literature contains several recent studies which suggest a developmental interaction between form and function. In a post hoc comparison of the first ten multiword utterances by two of her original referential and expressive subjects, Nelson (1978) enumerates "possible" language functions that the particular utterances could be used for. Nelson used Halliday's Phase I functional categories. The analysis indicated that most of the listed combinations produced by the referential child at 16 months could be used for the object oriented informative or heuristic functions (e.g., "Daddy shoe"; "spoon milk"). In contrast, the multiword utterances produced by the expressive child at the same age could be used for instrumental (e.g., "I want it"), regulatory (e.g., "Don't do it"), or interactive

(e.g., "I love you") functions. It must be emphasized that this analysis does not reflect how the utterances were actually used by the children in context. In the original study from which the sample utterances were derived, Nelson (1973) emphasized the difference among children in early lexical development, but did not empirically examine the interaction between form and function. Rather, Nelson investigated how the styles of early vocabulary growth relate to environmental influences such as maternal input and child's place in the family (i.e., first born vs. later born).

In a study focussing on the relationship between mothers' speech style and the referential-expressive distinction, Klein (1980) categorized children's first 50 words according to their form and function. The codings were based on diaries kept by the children's mothers. Klein reported that there were significant differences in the language used by the two groups of children. Referential children used language primarily to label things in their environment and expressive children were more likely than referential children to use language to control their environment and to get attention. However, all data were grouped so that individual referential and expressive children who did not conform to these patterns of use could not be determined. Despite this methodological consideration, implicit in Klein's results is the notion that the referential children had a more object oriented language and the expressive children a more socially oriented one reflected in both how they used their early words as well as the types of lexical items they acquired. This finding suggests an interaction between form and function that warrants further investigation by directly observing the functions

for which early words are used. A serious methodological problem with Klein's (1980) study was the assignment of the children's lexical items to functions based on the ways the mothers reported their children used their words, rather than by directly observing the children themselves. It is methodologically unsound to assign an utterance to a function without observing its use in context. Although interpretation of intended use is required to assign children's utterances to functions, reliance on maternal interpretation of use is especially prone to problems of reliability.

A longitudinal, observational study of the communicative functions used in the second year of life (Barrett, 1981) provides evidence for an interaction between pragmatic and lexical development. Barrett videotaped two children for a half-hour at biweekly intervals beginning when each had acquired ten different words. Barrett reported individual differences between children in the way they used language over the course of the study. One child, Emily, used language for indicative purposes from the beginning of the single word period and used several lexical items to express this function. The other child, Tina, acquired the indicative function at a later point in her linguistic development, but began to use language from the outset to oppose other people. Emily, on the other hand, acquired the opposition function later in her linguistic development. Barrett suggests that "Emily was more object-oriented than Tina in her use of language. Conversely . . . Tina was more person-oriented than Emily in her use of language" (Barrett, 1981, pp. 291-92). Emily also used language for the imaginative function, the use of language to represent situations which Barrett considers a cognitive, object-related

activity. In contrast, Tina used language in singing which he views as perhaps a more interactional, social activity. These differences in functions were reflected in lexical style as well. Emily acquired a referential vocabulary and Tina an expressive lexicon which included several stereotypical phrases such as "hiya" and "you do it." Barrett relates these style differences to those described by Nelson (1973) and Dore (1973; 1974).

Additional evidence for the form/function interaction in the stage of early language prior to the onset of syntax comes from Dore's (1973; 1974) analysis of the primitive speech acts of two children. He found that they differed with respect to the absolute and relative frequency with which they used certain types of speech acts. One child used more speech acts that involved persons (e.g., requests), whereas the other child had a greater frequency of use of acts that did not involve people (e.g., labelling). In addition to these differences in use, Dore's subjects also varied in terms of the forms each acquired. One child, whose style Dore called "code-oriented," produced more different words, whereas the other, whom he designated "message-oriented," used more varied intonation patterns. Thus Dore's study suggests an intimate relationship between form and function at the very beginnings of language acquisition.

Halliday's (1975) description of the language development of his son, Nigel, also supports a relationship between form and function. Halliday proposed that there was a "constant relation between content and expression" (Ibid., p. 14) in early nonlinguistic utterances, that is, the utterances Nigel used served a particular

function. Halliday extends this notion of a one to one relationship between form and function to the emergence of linguistic structure (vocabulary and early word combinations) as well. For example, he reports that when Nigel began using the word "syrup" in Phase I it was only used instrumentally to mean "I want my syrup" (Ibid., p. 42). Similarly, in Phase II the utterance "more meat" was only used pragmatically to mean "I want more meat" but not mathetically to mean "there's some more meat." Halliday states that "at first . . . each structure is tied exclusively to just one function" (Ibid., p. 47). Halliday does not specify how long each utterance remains unifunctional but claims that eventually utterances become functionally derestricted. His notion that utterances have a unifunctional origin but eventually serve more than one function is relevant to the issue of the relationship between form and function. If words are only used for one function, there is strong evidence for a relationship between these two domains of language. If there is not a one to one relationship between form and function, a weaker claim is made.

Several questions are raised by Halliday's hypothesis. First, what is the nature of the interval between unifunctional and multifunctional use? Halliday does not state whether it is determined by a lapse of time such as several days or a week or if it depends on the child's using the utterance any number of times. Further, was this sequence of unifunctional followed by plurifunctional use of utterances unique to Nigel, Halliday's only subject, or would this developmental pattern be observed in other children as well? Are all forms tied to one function as suggested by Halliday or can some

words be used for more than one function at first? At one point Halliday's claim seems weaker noting that the "majority" of Nigel's new words "are at first restricted to one function only" (Ibid., p. 42).

Data on the two children Barrett (1981) studied supports the weaker claim related to Halliday's hypothesis. These children used some words for only one function and others for more than one function. For example, one of the children used nominals for both requesting objects and for indicating objects. Although Barrett cites this example as evidence against Halliday's (1975) claim of a one to one relationship between form and function, Barrett does not state how long the child had been using the nominal forms. It is also unclear whether Barrett is referring to the child's use of particular words for two different functions since he refers to the use of a category of words (i.e., nominals) for the different functions. This question which has not yet been adequately examined could be explored by examining the functions that particular forms are used for shortly after their emergence.

There have been a few other studies in the child language literature which have attempted to examine form and function in relationship to each other. Using a taxonomy of communicative functions sharing similarities with both Dore's (1974) and Halliday's (1975) systems, McShane (1980) reported that a variety of lexical means were used to express some functions whereas other functions were more limited in the types of words with which they could be realized. Based on the data from six subjects studied longitudinally in their second year of life, McShane noted that the request function, for

example, was realized by using a person's name, an expression of recurrence such as "more," by naming the desired object or action to be performed, or by using a conventional grammatical means of signalling the request such as "I want . . . ." An example of a function restricted in the lexical means used for its expression is his vocative category, analogous to Dore's (1974) calling. Vocatives took the form of a person's name only.

McShane's description of the specific lexical and structural means used to realize particular functions was derived by combining the data from all observations of his six subjects thus obscuring any developmental changes in the way a function is expressed. Although McShane claims to express interest in how the realization of a function varied over time, his account does not achieve that goal in that it is limited to descriptive statements of the way functions were expressed by his subjects and lacks a systematic analysis of the changes that occurred over time.

Whereas McShane's (1980) approach to the study of the interface of form and function is qualitative, Leonard, Camarata, Rowan, & Chapman (1982) took a quantitative approach. In a study involving 14 normal children ages 18 to 24 months seen for one observational session, these investigators derived lexical type token ratios to measure the lexical diversity used in expressing each of McShane's (1980) categories. The ratios were the number of different words used to express the functions divided by total frequency of words used by the children to express the functions. The lexical type token ratios differed across functions as expected but not always in the expected direction. The authors reported that the measure was

artificially conflated in the case of infrequently occurring functions which were served by a single form, such as "thank you" for receiving. A limitation of the type token ratio Leonard et al. employed is that it tells only of the fact of diversity in lexical items used to express a function but does not describe that diversity in terms of individual words or types of words. Further, the method of grouping the data from all the subjects obscures any individual differences in the ways functions were expressed. Because the child language development literature points to differences in both form and in function, one would expect such differences to emerge if the data were analyzed on an individual subject basis.

The studies of both McShane (1980) and Leonard et al. (1982) represent recent attempts to integrate information on early word forms and how they are used by examining the different means used to express different functions. While little is known about the way different functions are realized, even less is known about a related question concerning the range of functions for which forms can be used at the beginning of language development.

Peters (1977) reported variation in one child's use of forms in different types of contexts. Her analysis of the changes that occurred in the forms as a function of communicative context is relevant to the main issue of the interaction of function and language form. Peters found that the child she investigated, Minh, had two distinct strategies he used in different types of speech situations. One strategy, called analytic, was characterized by the production of one word utterances, one or two syllables long. They were clearly articulated and approximated easily identifiable adult targets.

This type of speech was produced in referential contexts such as when "reading" a book. The other style of speech that Minh used was called gestalt. It was characterized by the rapid production of longer units of unintelligible speech accompanied by distinctive intonation contours. (A similar observation was made by Brannigan, 1977.) Minh often produced such "tunes" in communicative interactions with others.

The fact that Minh varied his speech style as a function of the social setting lends further support to the hypothesis that form and function interact in early language acquisition. The finding that Minh used the analytic, referential style in object oriented contexts and the gestalt, expressive type of speech in interactional situations is consistent with the notion of object and personal-social orientations discussed earlier in this chapter. Although based on a single subject, Peters' findings strongly suggest that there are functional differences related to context which influence the form of utterances and that these differences occur within one child.

To date there is a small but growing literature on the relationship between form and function in early language development. However, the majority of these are based on descriptions of only one or two children (Dore, 1973, 1974; Halliday, 1975; Peters, 1977; Barrett, 1981). Further, the reliance on anecdotal records (Halliday, 1975) or parental diaries (Klein, 1980) poses methodological problems related to the reliability of the findings. Systematically obtained videorecorded data is the preferred mode of data collection for the study of language functions. Studies that have used videorecorded observational methodology (McShane, 1980; Leonard,

et al., 1982) have been limited to sampling the child's language in only one context and, as a result, the data may not be representative of the range of forms and functions children use at this level of linguistic development. To more adequately explore the relationship between form and function, children's speech samples should be obtained in a variety of contexts that occur in their lives. It is also necessary to videorecord these samples so that function can be inferred from context, rather from an adult's recollection of the situation in which the child's utterance occurred.

Functional Approaches and the Development of Functions

A major proponent of a functional account of the ontogeny of language is Halliday (1975) who described the development of language in three phases. Halliday's source of data was his son, Nigel. In Phase I, which lasted from $10\frac{1}{2}$ to about 18 months, six functions emerged. The six Phase I functions Halliday identified are the instrumental ("I want" function), the regulatory ("do as I tell you" function), the interactional ("me and you" function), the personal ("here I come" function), the heuristic ("tell me why" function), and the imaginative ("let's pretend" function).

Halliday notes that the functions of Phase I were realized through vocalizations prior to the development of a lexicon. The use of nonlinguistic means such as vocalizations and/or gestures to express some communicative functions has been described by others (Dale, 1980; McShane, 1980). Such behaviors comprise a substantial portion of a child's communicative

repertoire during the prelinguistic stage and make up a substantial part of it even after first words are acquired.

In terms of a developmental sequence for Nigel's functional development, Halliday notes "there is no sign of a developmental progression within the first four functions. . . . What did emerge as some sort of developmental sequence, in Nigel's case, was (i) that the first four functions listed clearly preceded the rest, and (ii) that all others precede the informative" (1975, p. 40). This latter ("I've got something to tell you") function emerged several months later toward the end of Phase II when Nigel was about 21-22½ months old. Thus for Nigel, the instrumental, regulatory, interactional, and personal functions emerged first, followed by the later development of the imaginative and heuristic.

At this point, an important distinction must be made. In contrast to the functions individual utterances serve, such as the use of a particular vocalization for the instrumental function, there are global functional descriptions of the purposes language serves the individual (Rees, 1978). These broad-based accounts invariably include personal-social and object oriented uses of language. The personal-social use of language involves expressing the self or interacting with others. The object oriented use of language involves talking about and representing the world.

Halliday's (1975) account of language development includes descriptions of both the functions individual utterances serve as well as broad-based uses. Further, the individual functional categories can be related to the global characterizations of language use just mentioned. The first four emergent functions, the personal,

interactional, regulatory, and instrumental have a personal-social orientation because they involve the child in expressing the self or interacting with others. The personal function, which the child uses to express his individuality and self awareness, has an exclusively personal orientation. The interactional function is the child's use of language to interact with those around him and both the regulatory and instrumental functions involve the use of language to satisfy the child's own needs. The interactional, instrumental, and regulatory functions involve the child in social interaction. In terms of the broad-based functions mentioned earlier, it seems possible that the majority of the child's nonlinguistic utterances would have a personal-social orientation. This could be determined by examining the frequency with which the child uses individual functions having a personal-social or object orientation.

Toward the end of Phase I at 15-16½ months, Nigel acquired several recognizable conventional words which, according to the data presented in Halliday (1975), coexisted with his nonlinguistic vocalizations. At the end of Phase I, at 16½ months, a rapid increase in vocabulary was observed. Halliday reports that "for Nigel, the main functional impetus behind the move into the lexical mode . . . is learning about his environment" (Ibid., p. 43) noting that Nigel's new vocabulary is used at first in the context of observation and recall as a means of categorizing the world. What is suggested is that Nigel's words, as compared with his nonlinguistic utterances, are first used for object oriented functions.

In Halliday's account, functional development proceeds by the principles of combining and generalizing functions. In Phase II,

there are two functions which are higher order generalizations of Phase I functions. The combination, generalization, and abstraction of functions in the hypothesis provide a vehicle for continuity between the different phases of development, a point to be returned to later in this chapter. In Halliday's hypothesis, the instrumental and regulatory functions of Phase I combine to form the pragmatic or doing function of language; similarly, the personal and heuristic become the mathetic or learning function of language in Phase II. What is suggested by Halliday's use of the terms "generalize" and "combine" is that as the child develops, one can talk about the functions language is used for in a global sense, similar to the broad-based uses of language identified above. Halliday does not suggest that one can no longer identify utterances serving the particular functions used to characterize the earlier Phase I level.

Halliday suggests that while the more object oriented mathetic function of language is the impetus behind the development of vocabulary, the pragmatic function is related to the development of dialogue. According to Halliday, utterances having a pragmatic function (the instrumental and regulatory functions in Phase I terms) provide the motivation for dialogue because they require a response from others. Halliday reports the emergence of dialogue, manifest primarily as answering questions, when Nigel was around 18 months old. Nigel's development of dialogue seems consistent with the use of more social oriented functions later in the single word utterance period. In terms of a developmental sequence, perhaps words were used for more object oriented functions earlier in the second year and for more personal-social functions, or more likely specifically social

oriented ones later. Since Halliday did not examine the frequency of use of utterances having different functions or functional orientations, this suggestion is purely speculative. However, this question of whether object oriented functions are used earlier and personal-social functions are used later in the single word period could be answered if functional development was examined longitudinally in children. To date, there is a small but growing body of data on the development of functions. (For a review see Schwartz, 1982.)

Another issue relevant to development, in general, and to language acquisition, in particular, concerns continuity of development. Halliday's account of Nigel's linguistic development supports the notion of continuity. Halliday used the term "protolanguage" to refer to Nigel's meaningful nonlinguistic vocal output in Phase I. What is stressed in Halliday's use of this word is that although Nigel did not have a lexicon in the conventional sense, his utterances were continuous with language in functional terms. This particular notion would be appealing to those who support a continuity position between prelinguistic and linguistic development (e.g., Bates, Camaioni, & Volterra, 1975; Bruner, 1975). However, Halliday did not empirically test his hypothesis. The case for functional continuity would be strengthened by a demonstration of similar functional emphases for nonlinguistic and linguistic forms.

In Halliday's account, continuity between the major Phases, rather than within a Phase, is stressed. In terms of continuity between the Phases, pragmatic function is a more global way of characterizing the instrumental and regulatory functions of the previous phase, whereas the mathetic is a broader way of capturing the

personal and heuristic functions. The interactional function of Phase I serves both the broader pragmatic and mathetic functions. Halliday reported that in Phase II, pragmatic utterances were characterized by a rising prosodic pattern whereas mathetic utterances had a falling intonation contour suggesting this duality was reflected in suprasegmental form as well as in function.

This duality is continuous into the final stage of language development in Halliday's account, Phase III, where the distinction is made between the ideational component of language, a generalization and abstraction of the mathetic function of Phase II, and the interpersonal component of language, a generalization and abstraction of the pragmatic function of Phase II. Halliday claims that "to reach Phase III, the child has to develop on an awareness level two major zones of meaning potential, one ideational, concerned with the representation of experience, and the other interpersonal, concerned with the communication process as a form and as a channel of social action" (Halliday, 1975, p. 53). The ideational (representational, referential, cognitive) and interpersonal (expressive, conative, social, evocative) distinction in function is consistent with some of the patterns of variation in early language development reviewed earlier such as Nelson's (1973) referential and expressive lexical styles, Dore's (1973, 1974) code-oriented and message oriented styles, and Peters' (1977) analytic style used in referential situations and gestalt style used in social contexts. According to Halliday, this duality is also basic to the nature of language itself.

In discussing the influence of pragmatics on the acquisition of language, Rees (1982) cites Halliday's (1975) account as an

example of how function may be viewed as the motivation for language learning in general, whereas others (Atkinson, 1979; Bates & MacWhinney, 1979) have viewed function as the basis for the development of particular linguistic structures. Each of these accounts gives function a primary role in the development of language.

Bates & MacWhinney propose that grammar originates in pragmatically based functional language categories such as topic-comment. They present both a weak and a strong version of their functionalist view which differ in terms of the evidence needed for their support. For the weak version, they claim that language forms are correlated with communicative functions. Evidence to support this version would be the demonstration of correlations between linguistic forms and communicative functions. The strong version of the hypothesis, on the other hand, claims that forms are both determined and maintained by function. According to Bates & MacWhinney both the developmental emergence of particular functions before the use of particular forms for that function, such as the demonstration of the emergence of the topic-comment category prior to the development of syntax, and correlational data as mentioned above, would be necessary to support the strong version of the hypothesis. Thus, any data on developmental sequence in which form follows function lends support to the strong version of the hypothesis.

As sample evidence to support the strong version of the functional hypothesis, Bates & MacWhinney claim that children have the topic-comment category as early as the one-word stage. They cite Greenfield & Smith's (1976) study of the early semantic development of two children. In addition to examining the semantic content of

the children's one word utterances, Greenfield & Smith also investigated the situations in which certain words are coded and others left unsaid. Greenfield & Smith claim that the principle of informativeness, loosely adapted from information theory, predicts the word choices children make. Greenfield & Smith suggest that single word utterances tend to express new, changing, and/or uncertain information. The claim is made that contextual factors provide children with the implicit topic, what is presupposed. What children code in their one elliptical one word utterances is the comment.

Greenfield & Smith's (1976) study does not provide good evidence for the strong version of the functional hypothesis. In addition, there are several problems with this investigation. One problem results from crediting the child with sentential elements prior to the onset of word combinations, a criticism which applied to earlier accounts and the subsequent rejection of the single word utterance as holophrastic (Dore, 1975). Another problem with this approach is that one can never know what the child takes for granted, and hence presupposes, but rather what adults hypothesize they take for granted. In their analysis, Greenfield & Smith assume, for example, that the child takes proximal objects for granted, but not distal ones. Thus, the principle of informativeness predicts that children will rarely refer to proximal objects, but will frequently code distal ones. Examples from their data to support this prediction include their subjects' use of "no" to reject but object names to demand. The presuppositional analysis of the investigation has been controversial and provided the impetus for recent debate (e.g., Pea, 1979; Greenfield, 1980). As noted previously, it has been cited as an

example of a functional approach to language. However, Greenfield & Smith's application of the notion of informativeness relates to the influence of pragmatic factors on lexical choice rather than acquisition.

Unlike Greenfield & Smith's (1976) study, Atkinson's (1979) work is relevant to the acquisition of linguistic structures rather than to the choices made among linguistic structures already acquired. Like Bates & MacWhinney (1979), Atkinson views pragmatic factors as the basis for the development of particular linguistic structures. Atkinson illustrates how one linguistic form, the subject-predicate structure of simple sentences, originates in two functions, that of obtaining the listener's attention and making a statement. For example, a child whose mother is not present says "mommy" to his father. When the father queries "mommy?" with a rising intonation, the child replies "gone." Atkinson suggests that "a plausible candidate for the function of the initial 'mommy' of the child is that of drawing the father's attention to that individual, and only when the child gets some feedback to indicate that his addressee is suitably attending does he go on and predicate something of mommy" (p. 236). Although this example does seem to illustrate that the child used his utterances for the purposes specified, whether these functions are the basis of the grammatical categories subject-predicate cannot be determined on the basis of the data, but rather is a matter of interpretation. Atkinson's example could be interpreted as an instance of form following function, but is open to the same criticism of crediting the child's single word utterances as being sentential elements. However, the reverse sequence of function following form seems to be the case

in the development of many seemingly pragmatically based grammatical forms such as ellipsis (Bloom, Miller, & Hood, 1975), nominal/pronominal reference (Bloom, Lightbown, & Hood, 1975; Nelson, 1975) and definite/indefinite articles (Warden, 1976). In these cases, children first acquire the forms and eventually learn to use them for the appropriate functional distinctions they code in conversation.

In summary, functional approaches to the development of language in general and to the development of linguistic structure have been identified. Perhaps function can be used to account for the variation described in the development of children's vocabulary. There is some limited evidence in the child language literature to suggest a possible interaction between form and function in early language development.

Other Related Factors

Other factors which could influence lexical development include maternal speech style, the child's level of cognitive development, and phonological preferences and avoidances. Each will be discussed below in terms of a possible influence on the acquisition of first words.

Maternal Speech Style

Dore (1973; 1974) found that the dramatic differences in two children's speech act styles were paralleled by equally distinctive modes of parental interaction. The mother of the code-oriented, word baby intiated most interactions with her child. These interactions often involved direct instruction in language. Dore observed that this mother frequently labelled objects in the environment for her child.

The mother of the message-oriented, intonation baby, on the

other hand, displayed a more laissez faire attitude toward speech. In this dyad, most interactions were initiated by the child rather than the mother. For this mother, direct language teaching was not a primary mode of interaction, and consequently, the labelling of objects in the environment occurred infrequently.

Dore suggested that the differences in both the speech acts and the forms (words vs. intonation) that each child emphasized were possibly influenced by the nature of each mother's input. This position is consistent with the growing body of literature on mother-child interaction (Cross, 1978; Furrow, Nelson, & Benedict, 1979; Garnica, 1978; Newport, Gleitman, & Gleitman, 1977; Snow, 1977) which has attempted to demonstrate the effect of maternal input on the child's developing linguistic system. This recent literature relates to the larger issue of environmental influences.

Several recent studies (Klein, 1980; Mazur, 1982; Della Corte, Benedict & Klein, 1983; Furrow & Nelson, in press) examined the relationship between aspects of maternal speech and lexical development. In a longitudinal investigation, Mazur (1982) studied four mothers' responses to three object related gestures (pointing, extending objects, and open-handed reaching) in their infants from 9 to 18 months. Mazur analyzed the children's nonverbal communicative gestures and noted any words which accompanied them. The mothers' responses to the gestures were categorized along several parameters including whether or not they named the objects involved. The results indicated that the mothers produced labels in response to their children's pointing gestures significantly more than in response to their reaching and extending. This finding suggests, first, that the mothers interpreted

the pointing gesture as serving an object oriented, referential function and second, that the child can influence the input. The results also indicated that the mothers' provision of object names was significantly associated with the number of different object names their children used across the observational sessions. This finding suggests an interaction between one aspect of the linguistic environment, the relative frequency of object naming, and the number of different object names acquired and used.

The role of input frequency in lexical acquisition was directly explored within an experimental paradigm (Schwartz & Terrell, 1981). The twelve children who participated in the lexical training study were at the beginning of the single-word utterance period when the investigation began. Training was conducted over ten sessions in a four month period. The children were taught 16 nonsense names representing a variety of exemplars including both objects and actions. The contrived lexical items were named by one of the investigators either frequently (twice) or infrequently (once) in each session. The results indicated that the children produced either spontaneously or through elicitation (e.g., "What's this? or "What am I doing?") on at least one occasion a significantly greater number of words for frequently presented exemplars than infrequently presented exemplars. While the authors used the term "acquired," the lack of a productivity criterion for considering a word "acquired" in this study is problematic. A single instance of use seems an insufficient number for a word to be considered part of a child's lexicon. Another consideration is related to the methodological differences between experimental and observational studies of child language. One must be cautious in making analogies between

the experimental situation of lexical training to the process of natural acquisition. The lexical training procedure described in this study is different from the language learning environment of the child in that an investigator, rather than the mother or other familiar person provided the models. Nevertheless, the results do lend further support to the notion that the frequency of the input is one of the environmental influences that may affect lexical acquisition or use.

In a naturalistic, observational study, Klein (1980) investigated the speech characteristics of the mothers of children classified as referential and expressive according to Nelson's (1973) distinction. Klein selected the mothers of the 5 most referential and 5 most expressive children from a group of 19 subjects who had reached the 50 word level. Klein analyzed audiorecorded samples of the mothers' speech in two contexts, breakfast and play, to determine whether the mothers of referential and expressive children differed on various language measures. The results indicated that the mothers of the referential children used more common nouns and made more references to objects than did the mothers of the expressive children. Klein interpreted these results as suggesting that maternal speech style may influence the child's lexical orientation.

In a later study, Della Corte, Benedict, & Klein (1983) examined some pragmatic and structural characteristics in audiorecorded samples of the speech of mothers of referential and expressive children during the caretaking contexts, diapering, dressing, and bathing. The mothers' utterances were coded for communicative intent (e.g., labelling, social play), focus of attention (e.g., child oriented, task oriented), and evaluation (e.g., approval, disapproval) to determine whether

speech was serving different functions for the two groups of mothers. Common nouns, noun/pronoun ratio, and noun type/token ratio were among the structural dimensions of the mothers' speech that were measured. Volubility was also of interest since it was hypothesized that the mothers of the referential children would use the caretaking situation for instructional purposes as well as accomplishing the task at hand. Following Klein (1980), the data from the mothers of the five most referential and five most expressive children were analyzed. The results indicated that there was no significant difference between mothers of the referential and expressive children on the structural measures. This finding differs from Klein's (1980) results which indicated that mothers of referential children used more nouns than mothers of expressive children.

In terms of volubility, there were significant differences between the groups of mothers in the expected direction with mothers of referential children talking more than mothers of expressive children. In terms of the pragmatic measures, significant differences were obtained on only two of the communicative intent categories with the mothers of the referential children using significantly more descriptions (i.e., comments about persons, objects, and events), and the mothers of the expressive children using significantly more prescriptives (i.e., commands or directives). No significant differences between the mothers emerged in the focus of attention and evaluation categories. This study, in contrast to that of Klein (1980) found a relative lack of differentiation between the two groups of mothers. The authors suggest that the goal-directed, structured nature of the caretaking contexts may have constrained the types of verbal interactions the mothers

produced. However, despite the situational constraints, the mothers of the referential children spoke and commented more while the mothers of the expressive children were more concerned with directing their children's behavior lending some support to the notion that the mothers' speech has some influence on her child's language development.

As Della Corte et al. (1983) suggest, the situation in which data is collected must be taken into account. Although these investigators used three different contexts, each of the ones chosen involved caretaking and required the mothers to accomplish specific goals. The Klein (1980) investigation, which only used two contexts, one involving caretaking (breakfast) but the other one not (play) allowed more opportunity for potential differences between the two groups of mothers to emerge. The two activities Klein chose for her analysis focussed on different aspects. The feeding context, because of the caretaking involved, emphasized interpersonal interaction. The play context, on the other hand, which involved toys was more object oriented in focus. The orientation of these different contexts, of course, is relative and not absolute. For example, the breakfast situation involves several objects including eating instruments and foods, while play often involves interpersonal interaction. Yet future studies concerned with differences in the speech characteristics of mothers of referential and expressive children should be designed to sample maternal speech in both types of contexts to insure a more representative data base and to maximize the opportunity for possible differences to emerge.

The Nelson (1973) study of early vocabulary development cited earlier also bears on the issue of environmental influences. Nelson found that two factors, the educational level of the family and the

child's birth order within the family, tended to predict whether a child would be designated referential or expressive. Referential children tended to be first borns, whereas expressive children were more often later borns. In terms of educational level, referential children tended to come from more highly educated families than the expressive subjects although all were middle class from the same geographical region. These environmental factors may be associated with particular types of speech inputs.

Another dimension of parental input that seems particularly relevant to early lexical development is the content of the parent's utterances. Perhaps parents who talk more about objects have children with a large number of nouns in their vocabularies. Conversely, parents who more frequently refer to themselves or their children, rather than objects, may have children with fewer nouns but more words of an interpersonal sort. Nelson (1973) coded parent utterances into two overlapping content categories, those which related to objects and those which related to the child. Nelson found that both object and child references were about equally frequent overall. She did not analyze the content for mothers of referential children separately from that of the expressive subjects.

In a recent investigation, Furrow & Nelson (in press) found that what mothers talk about, specifically their references to objects and persons, was related to the nominal-pronominal preferences reported in Nelson (1975). The results of the "nominal shift" investigation indicated that while referential children preferred nouns to pronouns and expressive children showed a preference for pronouns at low MLU's (1.0-2.5) based on language samples taken at two years,

differences were eradicated as utterance length increased. At high MLU's (2.5-4.0), expressive children continued to prefer pronouns, while referential children showed an even greater use of pronouns than expressive children.

Furrow & Nelson (in press) examined the speech of the mothers of the children to determine if two aspects of mothers' speech potentially related to these stylistic differences. They examined the mothers' use of 1) nouns and pronouns and 2) references to objects and persons. These aspects of mothers' speech were chosen for analysis to determine whether children were differentially focussing on the forms (nouns and pronouns) or functions (object references and person references) of their mothers' speech. Furrow & Nelson (in press) argued that if child differences exist because children are learning particular linguistic forms from their mothers, then maternal noun/pronoun differences should predict children's noun-pronoun use. On the other hand, if children's different speech styles are related to the person vs. object oriented functions of their mothers' speech, person-object references should differentiate the mothers of the two groups.

The results indicated that the mothers did not differ significantly in their use of nouns and pronouns. The investigators also found that as the children's MLU rose, mothers of the referential children showed an increase in the relative frequency of use of person references while mothers of the expressive children showed a proportional decrease in the frequency of use of person references. The authors conclude that children are influenced in their noun and pronoun preferences by their mothers' person or object references. Furrow & Nelson propose that "if a maternal shift from objects to persons is responsible for

children's noun to pronoun shift from low to high MLU's, then it can be inferred that this factor may have been at least partially responsible for the original referential and expressive differences." This inference is strengthened in light of Klein's (1980) demonstration of a greater proportional use of object references in mothers of referential children in the period of early lexical development, prior to the acquisition of the first fifty words, the level at which the referential-expressive distinction is made (Nelson, 1973).

The results of these recent studies examining the relationship between mothers' speech and individual differences suggest that maternal speech style must be considered as an environmental factor which could influence lexical development. It could be the case that mothers vary in what they stress in their verbal interactions with their children as found in Dore's (1973), Klein's (1980), and Furrow & Nelson's (in press) investigations. On the other hand, the similarities may be more apparent than the differences, a position consistent with most of the findings of the Della Corte et al. (1983) study.

Cognitive Influences

Another factor that may be related to lexical development is level of cognitive development. Relationships between aspects of language and level of cognitive development have been suggested in the language acquisition literature although the evidence is often inconclusive and sometimes contradictory.

Bloom (1973) speculated that Allison's increase in the number of substantive forms acquired and used toward the end of the single word utterance period may have been due to her development of a concept of a permanent object. Bloom argued that learning object names depends

on the child's ability to conceptually represent the objects to which his words refer. Bloom noted that Allison's increase in substantive forms occurred around the time that object permanence develops in most children, but she did not independently measure Allison's level of object constancy.

Motivated in part by Bloom's argument of a relationship between object permanence and lexical development, Corrigan (1976) examined level of object permanence and language development in a cross-sectional investigation of 30 children, 10 to 26 months. She found no significant correlation between level of object permanence measured by an expanded version of the Uzgiris-Hunt scale (1975) and a measure of utterance length which included both nonlinguistic vocalizations and words. In a longitudinal study (Corrigan, 1976; 1978) involving three subjects, 9 to 23 months, Corrigan found some relationship between language and object permanence. Although she did not find a one to one correspondence between linguistic and cognitive growth, she did find that the attainment of the preoperational level in which the child must solve the problem of three invisible displacements was followed by the largest increase in vocabulary growth demonstrated in the subsequent session. This relationship was consistent for the three subjects and was observed when the children were about 19 months old. This age is consistent with the approximate ages for the spurt in vocabulary growth reported throughout the lexical development literature (Benedict, 1979; Bloom, 1973; Dore, in preparation; Halliday, 1975; Nelson, 1973). In Corrigan's (1976; 1978) study no precise relations were found between object permanence rank and the frequency or endurance of two classes of words, function and substantive forms, defined by Bloom (1973).

In a correlational study of the relationship between cognitive and language development, Bates, Benigni, Bretherton, Camaioni, & Volterra (1977) found that object permanence was a poor predictor of several language measures including the number of words comprehended and produced, the frequency of non-referential and referential speech, and the use of unritualized and ritualized requests and refusals. The different language measures used in the Bates et al. (1977) and Corrigan (1976; 1978) studies could account for the different findings of the studies. In addition, differences in the ages, and by extrapolation, probably cognitive levels as well, could account for the discrepancy in the results. The children in the Bates et al. (1977) study ranged in age from 9 to 13 months old. The children were likely at the beginning of the one-word stage. Corrigan did not find a relationship between object permanence and language until the end of the single word period when her subjects were around 19 months old. Corrigan's finding that the attainment of a preoperational level of object permanence preceded the spurt in vocabulary growth supports Bloom's (1973) position on the relationship between the two domains. However, a problem with the object permanence task at the preoperational level is that it relies on memory (Nelson, personal communication). The object permanence task, therefore, involves more than the assessment of the concept of a permanent object.

Another cognitive domain that has been related to language development but does not rely on memory is means-end ability. For example, Bates et al. (1977) found that means-end ability based on the Uzgiris-Hunt scale (1975) was a good predictor of a language production measure which included among other factors some linguistically and

nonlinguistically realized functions (e.g., requests and refusals) and vocabulary size. In discussing the theoretical importance of and logical relationship between means-end behavior and language, Bates, et al. (1977) suggest that the

> the cognitive capacities involved in imitation and tool use are also . . . involved in . . . language. This does not mean that these are the only capacities involved in language development. For example, some form of object permanence--if only enough to recognize that an object is the same, in order to name it--is clearly prerequisite to language (p. 48).

Snyder (1975) conducted an experimental investigation of the pragmatic and cognitive abilities involving 15 normal children ages 11 to 18 months operating at the single word stage of language development. Snyder examined the children's ability to express two speech acts, declarative and imperative performatives through tasks designed especially for the investigation. Cognitive abilities were assessed through the administration of the six Uzgiris-Hunt (1975) scales. The results "indicated that only one area of cognitive ability was a significant predictor of performative proficiency: the development of means-end relationships" (Snyder, 1975, p. 155). Like Bates and her colleagues (1977), Snyder indicated the logical relationship between means-end behaviors and the ability to use language as a tool to achieve an end. Snyder found means-end ability predicted the child's ability to use both types of speech acts, the imperative, which were requests, and the declarative, which in this study meant the child's ability to use a word (or nonlinguistic signal) to get the adult's attention. Both types of speech acts, as described by Snyder, involved the personal-social use of language. Means-end abilities could be related to the development of a more personal-social oriented expressive vocabulary or to the use of more personal-social functions because of a possible relationship

between using nonlinguistic means to achieve ends and using words to express self and interact with others. Perhaps level of means-end cognitive development would differentiate children with different lexical types and/or functional preferences with expressive personal-social oriented children achieving higher levels of means-end cognitive development than referential object oriented children.

Phonological Influences

Other factors suggested in the child language development literature as influencing the makeup of children's early vocabularies are the processes of phonological selection and avoidance. Several investigators (Ferguson & Farwell, 1975; Menn, 1971) have observed a tendency for children to produce words having certain sounds and avoid others based on the child's phonological system. In addition, experimental studies (Leonard, Schwartz, Morris & Chapman, 1981; Schwartz & Leonard, 1982) provide evidence that support the observational studies in suggesting that phonological influences may be a factor in early vocabulary development. However, this type of evidence concerns the influence of phonological selection and avoidance upon the use of specific lexical items rather than the type or category of words learned. Phonological selection and avoidance could not influence the type of words children acquire unless all the words in a particular category, such as general nominals or action words, had the same syllabic structure and phonemic makeup. It would appear then that phonological selection and avoidance are not likely explanations for lexical style differences.

Conclusion and Need for the Study

There is some evidence from both observational and experimental sources to support a theoretical interaction between form and function in early language development. Functional emphasis has been suggested as a possible influence on early lexical development in particular. Two functional preferences, person-social and object orientation, have been identified as consistent with the language patterns described in the individual differences literature. These patterns may be reflected in the child's entry into the linguistic system and would be manifest both in the early functions the child favors as well as the first words learned. If there is a relationship between pragmatic and lexical development, one would expect children who acquire referential vocabularies to use more object oriented functions than expressive children and expressive children to use more personal-social functions than referential children. To date, there has been limited research on the relationship between functional development and the acquisition of first words. The evidence we do have is limited to descriptions of only a few children as has some of the other methodological problems discussed earlier. The one study that addressed this question directly (Klein, 1980) relied exclusively on the mothers' reports of how their children used their words rather than observation of the children directly. Thus, the question of the relationship between functional development and the acquisition of first words is an unanswered one.

Alternative explanations for the lexical style differences observed in the period of early vocabulary development were considered. Means-end behavior was mentioned as possibly related to the child's ability to use language for more personal-social functions and the

development of an expressive lexical style. To explore the developmental interaction between form and function in early lexical development, children's functional development was studied during the period in which they acquired first words. Specifically, the following questions were asked:

1. Is there a predominance of either personal-social or object oriented functions in the early single-word utterance period, that is, when the child has acquired at least 10 different words? Is there a difference among children in the dominant type of functions expressed?

2. Is there a predominance of either personal-social or object oriented functions in the middle single-word utterance period, that is, when the child has acquired between 20 and 30 different words? Is there a difference among children in dominant type of functions expressed?

3. Is there a predominance of either personal-social or object oriented functions toward the end of the single-word utterance period, that is, when the child has acquired at least 50 different words? Is there a difference among children in dominant type of functions expressed?

4. If there is a predominance of functions, is it the same throughout or does it shift over time?

5. Is there a continuity between the functions for which nonlinguistic utterances are used and the functions for which linguistic utterances are used in the early part of the single-word period?

6. Are lexical styles based on vocabulary counts derived primarily from diary data (that is, referential and expressive, Nelson, 1973) consistent with lexical styles measured by relative frequency

data derived from observation in the period of early vocabulary growth? Are lexical styles based on vocabulary counts consistent with lexical styles measured by the number of general nominal types in this same period?

7. Are general nominals used for more object oriented than personal-social functions at the beginning, middle, and end of the single-word utterance period?

8. What are the most frequently used form/function interactions in the beginning, middle, and end of the single-word utterance period? Do difference exist among children?

9. Do children use words for only one function or can words be used for more than one function in the beginning of the single-word period?

10. Does level of means-end cognitive abilities differentiate children who develop expressive vocabularies from children who develop referential vocabularies? Does level of means-end cognitive abilities differentiate children who use mostly personal-social functions from children who use mostly object oriented ones?

CHAPTER III

METHOD

Subjects

Eight children from white middle class families in the New York metropolitan area served as subjects. The subjects were volunteers whose mothers responded to an advertisement seeking mothers of 10 month old children interested in participating in a home based study of language development. The advertisement was placed in two sources. It appeared in the Mothers' Memos, a newsletter published by the Mothers' Center, a networking organization for mothers of young children. The ad was also posted in a Y.M.H.A. which conducted several infant and toddler programs. Interested mothers contacted the investigator by phone and, from these contacts, four males and four females, four first and four later borns were selected so that two subjects represented each of the four possible gender by birth order groupings. The four gender by birth order groupings used in the present investigation were selected to increase the likelihood of obtaining language style differences among the children. Nelson (1973) found the referential-expressive lexical style differences to be related to gender and birth order.

When the mothers agreed to participate, an initial meeting between the investigator and each mother-child dyad was arranged to introduce the mothers to the study. The children were about 10 months

old at the time of this first home visit. Table 1 lists the eight children in the gender by birth order groupings.

To establish comparability with the child language literature, an additional selectional criterion was established. Both parents were required to have a minimum high school education. In fact, two of the participating mothers held graduate degrees and five had bachelor degrees. The remaining mother completed technical training beyond high school. Based on the occupation of one or both parents, six of the households could be characterized as professional families and the other two as white collar. An additional requirement of the study was that the mother be the child's primary caretaker and not work outside the home more than 10 hours a week. This criterion was established to increase the probability that the mother would be the one to observe her child's emergent vocabulary items and also keep accurate diary records. Four of the participating mothers were employed outside the home on a part-time basis for the duration of the data collection period, but none worked outside the home more than 10 hours a week.

Procedures

The data for the study came from two major sources. First, diary records of each child's lexical development were kept by the mother and supplemented by informal mother-investigator interviews and investigator observations. Second, naturalistic observational data was collected at three points in time in the home during the single word period.

For a child's vocalization to be considered a word, certain phonetic characteristics were considered. Minimally, a vowel or consonant in the

TABLE 1

THE GENDER BY BIRTH ORDER GROUPING OF THE EIGHT CHILDREN WHO SERVED AS SUBJECTS

	First Born	Second Born
Male	Michael	Jeremy
	Steven	Adam
Female	Jamie	Lauren
	Nadine	Rachel

Note: The names of the subjects are pseudonyms.

word had to match the adult equivalent or be explainable in terms of phonological processes (e.g., Ingram, 1976), unless the mother reported or the investigator observed an idiosyncratic production of a particular form. Another requirement for a word was that the form be used consistently across contexts. Vocalizations that did not meet these criteria were considered nonlinguistic.

In the present study, a word was considered part of the child's vocabulary if it was used on at least five different occasions, where occasion is defined as a non-repetitive instance. The decision to require five non-repetitive occurrences of a word, although arbitrary, is consistent with the productivity criterion established in Bloom's (1970) study of semantic-syntactic development. Further, it was felt that five instances of each new word was a reasonable number for the parent-observer to record. Forms used only imitatively were not counted as part of the child's vocabulary.

Parental Reports of Language Development

Mothers served as informants regarding their children's language development. Each maintained a diary of the vocalizations her child used with consistent meaning, whether or not they had equivalent adult forms.

At the initial interview conducted in each child's home, the investigator oriented the parents to the study and explained the diary record keeping procedures to them. The parents were provided with written instructions and a sample diary record sheet with completed entries to aid them in the data collection. The parents were also provided with a booklet, "My Baby's First Words," containing the diary record sheets used for their actual entries.

The instructions and diary record sheets used for the data collection were devised for the purposes of this investigation. Some of the column headings were based on the diary procedures described in Braunwald (1978), Miller (1981), and Nelson (1973). The form used in the present study had 11 columns. Four of the columns were for the entry of information regarding nonlinguistic context. To aid the investigator in determining if the forms were used meaningfully, parents were asked to describe the who, what, and where in which their children's utterances were embedded. With this goal in mind, four of the columns (6, 7, 8, and 9) required somewhat overlapping information regarding context. Following the suggestion of Braunwald & Breslin (1979) redundancy was purposefully built into the diary data collection procedure to increase the likelihood that the parent-observers would provide the investigator with sufficient information to place the words reported in the diaries into a modified version of Nelson's (1973) categories of form.

In addition to those four columns requesting parents to describe aspects of the nonlinguistic context, an additional space, column 10, was used for parents to provide a gloss or possible meaning of the child's utterance. Filling in this information was optional and was usually omitted. The parents were requested to enter the contextual information that accompanied their child's initial use of a form, unless the child's first use of a form was imitative. In these cases parents were requested to complete the contextual information for the first non-imitative use instead. They indicated subsequent occurrences of a form by checking in column 11. (See Table 2.)

Throughout the entire data collection procedure parents were

TABLE 2

A SAMPLE DIARY RECORD SHEET USED BY THE MOTHERS TO RECORD THE DIARY DATA ON THEIR CHILDREN'S VOCABULARY DEVELOPMENT WITH EXAMPLES MADE UP FOR THE MOTHERS PROVIDED WITH THE BOOKLET, "MY BABY'S FIRST WORDS."

Child's Name:					DIARY RECORD					Page:			
1	2	3	4	5	6	7	8	9	10	11			
Date of first use	No.	Child's word as said	Adult's word	Imit. Yes/No	Directed to: person-who object-what nothing apparent	Who was present?	Where was was s/he?	What was happening when s/he said it?	What did s/he mean? (optional)	Said it again?			
1/1	1	ooh-ooh	?	no	a bar of soap	M	in bathtub	It was bathtime. S/he pointed to the soap and said it. I think I missed the 1st use.		✓	✓	✓	✓
1/3	2	hos	hot	yes	M	M	in kitchen	S/he walked past the stove, looked at it, touched it, and I said "hot." Then s/he said it right after me in a whisper.					
1/6	3	t-t-t-t-t	clock	no	nothing apparent	M, F, & some of our friends	in living room	S/he was looking at the clock; we were talking with our friends. S/he seemed to be in a good mood.		✓	✓		
1/7	4	dus	juice	no	F	F	in kitchen near refrigerator	S/he walked to the refrigerator and pointed to it; s/he was whining; F was standing nearby.		✓	✓	✓	

encouraged to enter any additional diary notes they could such as the situations in which a form was subsequently used, whether or not the child continued to use a form beyond the fifth occurrence, etc. The type of information requested of the parents appears in Appendix A, Diary of Vocabulary Development, Procedures for Parents.

Maternal Interview

A maternal interview was conducted biweekly in the child's home. The purposes of the interview were to enable the investigator to review the diary with the mother, give her feedback regarding the entries made, clarify any questionable information, obtain information regarding subsequent uses of forms, and observe the child's linguistic output including the use of previously reported and new forms. The investigator's observations of the children at these biweekly intervals were used to enhance the diaries.

An additional purpose of the interview was to aid the mother in the recall of any additional lexical items her child may have used that were not entered in the diary. This was accomplished by asking the mother if her child said any new words in situations such as feeding, bathing, diapering, dressing, playing, looking at books, or in places such as the store, doctor's office, in the car, stroller, or on any other outings.[1] Some of the situations the mothers were asked

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[1]The investigator would like to thank Jeri Hafitz for suggesting the idea of questioning parents regarding their children's vocabulary in this situationally based way. This contextual method of probing eliminates the possibility of biasing the parent toward particular lexical items which a recognition method (for example, Snyder, Bates, & Bretherton, 1981) seems likely to generate.

The investigator also wishes to thank Fran Feintuch for suggesting some of the specific situations likely to occur in a day in a one year old's life.

about varied depending on individual parent-child routines. For example, mothers whose children were involved in play groups or other programs were asked about their children's use of words in these situations as well. The investigator's questions varied according to the information the mother provided. An example of the type of questions the investigator asked regarding a particular situation are as follows:

1. Did Adam say anything to you when you gave him a bath?
2. Did he say it on his own or did he say it after you?
3. What was going on when he said it?
4. What do you think he meant?
5. Has he said it again?

Forms that the mother recalled through this questioning procedure were entered in the diary if the child said them non-imitatively and meaningfully.

Cumulative Vocabulary Record

This record of the child's first fifty words is referred to as a cumulative vocabulary record. The lexical items which made up this record for each child were derived from four sources of information. The primary source of input to the cumulative vocabulary record was the diary data collected by the mothers over the course of the study. Words not entered in the diaries that the investigator observed during the biweekly home visits and videotaped observations were subsequently entered in the diaries. Finally, words the mother recalled through the questions asked by the investigator at the home visits were also entered into the diaries. Thus, each cumulative vocabulary record was a composite of 1) forms entered in the diary by the mother on her own, 2) those observed by the investigator during the home interviews and

3) videotaped observations, and 4) those recalled through the investigator's questioning the mother about words her child might have used in different contexts. All forms in the cumulative vocabulary record had to meet the same criteria for qualification as a word specified earlier as well as be used five different times.

Videotaped Observations

The children were videotaped in their homes while interacting with their mothers during naturalistic contexts. The observations were primarily of mother-child interactions, but fathers and older siblings were occasionally present for part of the tapings. Other family members were allowed to interact with the child in keeping with regular household routines. A portable video system was used by a research assistant/cameraman who did the taping. The interactions of the investigator and cameraman with the mother and child were kept at a minimum. Both responded naturally if addressed by any household member, but did not initiate interactions with them during the tapings.

Each mother-child pair was observed during six activities which were selected to focus on interpersonal interaction or on objects. The three interpersonal contexts were the caretaking activities of bathing, dispering/dressing, and feeding. The three object oriented contexts were looking at the child's own books, playing with the child's own toys, and playing with a box of toys provided by the investigator. The examiner's box of toys contained fifteen common objects and toys whose names were likely to be in the repertoire of one year olds based on the vocabulary words reported in Nelson (1973). They included a toy dog, cat, duck, car, boat, truck, clock, ball, doll, spoon, cup, keys, hat, a pair of shoes, and a box of blocks. The use of the same objects by

each mother-child pair was aimed at providing some degree of uniformity in one context for the observational procedures, while the use of the children's own books and toys for the other two contexts allowed for individual parent-child stylistic preferences to emerge.

The observational data for each point in time was always collected in one day. On the day of the taping, the investigator and cameraman spent approximately two to three hours in each household. The mothers knew in advance what activities would be taped. The order for each taping was decided by the mother in an attempt to minimize the disruption of the household routines. Occasionally the mother had to rearrange some aspect of her baby's schedule such as bathing. The video equipment was usually shut off between contexts and moved to another room if necessary for the next activity. For example, it was moved from the kitchen for feeding, to the bathroom for bathing, and to the child's room for diapering/dressing. The object oriented activities often took place in the living room or in the child's room. If the mother chose to do these activities sequentially, it was not necessary to move the equipment between these contexts.

The home observational sessions were scheduled at three points in time, referred to as Time I, Time II, and Time III. The observations at Time I took place when the child's cumulative vocabulary totalled at least 10 words. The Time II observation was planned to occur when the record indicated the child had between 20 and 30 words. The Time III session was scheduled when the child's cumulative productive lexicon reached at least 50 items. In practice, as indicated by the first horizontal lines in Appendix B, Time I ranged from 12 to 22 words and Time II ranged from as few as 25 to as many as 40

words. Time III ranged from 51 to 65 words.

Several factors accounted for why the number of words in the children's vocabularies often exceeded the number originally planned. First, some observations were delayed due to events such as child illness, a death in the family, or the scheduling of a family vacation. Such events were beyond the investigator's control. For example, Lauren's first observation was postponed for two weeks because she was ill. Consequently, her diary contained more words than the number planned when the observation was taped.

Secondly, in later transcribing the tapes, the investigator occasionally found words a child used not entered in the diary. If eventually used five times, these words became part of the child's cumulative vocabulary record. Words first observed this way were treated like all other words the child used in that the date the word was first observed was recorded. A word's placement on the list in Appendix B, which is a chronological listing of each child's first fifty words used at least five times, was determined by the date of its first use. Consequently, if a word was first observed at the first videotaped session, it appears above the first line in Appendix B. Similarly, if a word was first used at the second session, it was listed above the second line in the appendix. Thus the appearance of larger vocabularies for some of the children was due to additional words first used during a videotaped observation. For example, in the case of Lauren's first session, the five items above the first line (i.e., "what that" through "pop") were not entered in her diary prior to the taping. However, because these words were first used at Time I they are listed in the cumulative vocabulary record with the words

which emerged prior to the first observation.

A third factor that could account for the larger vocabularies was unpredictable spurts in vocabulary growth that occurred between the time the observation was scheduled and the time that it actually occurred. These factors, either singly or in combination, explain why the children had larger vocabularies than planned. However, because there was no overlap in the number of words in the lexicons for any of the children across the three observations, they were considered distinct time periods approximating the beginning, middle, and end of the single word period.

Because of the reported low volubility of child talk in the single word utterance period (e.g., Greenfield & Smith, 1976), it was felt that a minimum number of utterances for the observational sessions would be unrealistic. Instead, a minimum of approximately 75 minutes of total taping time across contexts was established.

All sessions were recorded with an RCA CC011 color video camera and JVC HR 2200U video cassette recorder. Additional illumination, in spite of the low-light capabilities of the camera, was needed to provide optimum picture quality. The illumination was provided by a 600 watt single source tungsten key light which was manageable while providing the extra light necessary to obtain optimum picture quality.

The camera was hand held at the level of the mother and child so that the videotapes reflected their point of view. This enable the investigator, in later transcribing the tapes, to obtain a better perspective of the situational contexts in which the interactions had occurred. Further, with a hand held, rather than a stationery,

camera, the cameraman was able to follow the mother and more often the child, if they moved out of the immediate surroundings. This allowed mobility for both mother and child contributed to the naturalistic quality of the tapings.

Cognitive Ability

Level of means-end behavior has been suggested as predictive of the child's ability to use language as a tool for social interaction (Bates, Begigni, Bretherton, Camaioni, & Volterra, 1977; Snyder, 1975). In terms of the functional orientation categories used in the present investigation, level of means-end abilities may be related to the use of more personal-social functions and possibly to the development of an expressive vocabulary. To explore these relationships, the means-end portion of the Ordinal Scales of Psychological Development (Uzgiris & Hunt, 1975) was administered within one week of each videotaped observation. Each child was assigned to a sensorimotor level for each observation based on the highest demonstrated behavior.

Transcription

The procedure for transcribing the video recorded data was adapted from the conventions described in Bloom & Lahey (1978). All words that the child produced were transcribed into standard orthography. The occurrence of nonlinguistic forms at Time I were noted on the transcripts, but there was no attempt to transcribe them phonetically. Adult utterances preceding and following child utterances were transcribed in conventional orthography. Aspects of the nonlinguistic context including relevant features of the setting, child and adult actions and behaviors, and orientation and gaze were transcribed for each utterance.

Coding

The first fifty words that made up each child's cumulative vocabulary record and the words each child used during the videotaped observations were coded into categories of form (as adapted from Nelson, 1973). In addition, the observational data was categorized into functions. The procedures for these codings are described below. Following McShane (1980) coding of the observational data was carried out by using the transcriptions in conjunction with the videotapes.

Form

The categories of form used in the present investigation were an adapted and expanded version of those described in Nelson (1973) and differed from Nelson's in several ways. With the exception of pronominals, the first six categories were taken directly from Nelson and the last ones evolved from the data. In her study, Nelson (1973) included pronominals in the general nominal category. However, Nelson (1975) later found that nominal-pronominal differences in early multi-word utterances were related to the referential-expressive distinction. Since this study was also concerned with these same linguistic style differences, it was decided that general nominal and pronominal forms be categorized separately.

Another difference between the categories used in the present investigation and Nelson's (1973) was that Nelson's function category, defined as words that fulfill solely a grammatical function such as "what" and "to," was not used in this study because such words, if they occurred, were better described as formulas. Nelson (1973) did not have a category of formulas, although in a later work (Nelson,

1981) she discussed their significance as early forms of child speech. Similarly, the category of formula fragments,[2] unique to this study, emerged to describe some of the forms used in the observations.

Another difference was the use of categories of multi-word forms. Nelson's system, since it was designed to code individual vocabulary items, did not need to include categories of multi-word utterances. A requirement of the system used in this study was that it be capable of coding forms appearing in the observations as well as in the diaries. Multi-word utterances did appear in the samples.

It was also necessary to code those forms which could be equivocally assigned to more than one category based on the context in which they were observed. Eleven categories of form are defined below and examples from the data follow each definition.

1. Specific Nominal

definition: words, excluding pronouns, used to refer to only one exemplar of a category whether a proper name (that is, a class with only one member) or not.

examples:

a) Adam looks at his reflection in the mirror and says "Adam."

b) Nadine looks at her father and says "daddy."

c) Adam looks at and points to a picture of the character Bert in a Sesame Street book and says "Bert."

2. General Nominal

definition: words, excluding pronouns, used to refer to

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[2]The investigator would like to thank Katherine Nelson for suggesting that the term "formula fragments" be used to describe utterances which seemed to be parts of formulas.

all members of a category whether the category is adult or child defined as in the case of over- or underextended terms.

examples:

a) Nadine says "cheese" as she looks at the cottage cheese on her high chair tray.

b) Lauren says "dog" as she points to the toy dog in the box of toys provided by the investigator.

c) Steven says "car" as he gives a toy car to his mother.

3. Pronominal

definition: words that can stand for general nominals and specific nominals, but do not have stable referents of their own.

examples:

a) Lauren says "here" as she looks at and points to a picture in her book in response to her mother's question "where's the bed?"

b) Adam says "that" as he points to a bowl of noodles on his high chair tray.

c) Steven says "this" as he picks up a book and gives it to his mother.

4. Action

definition: words that describe, demand, or accompany action or that express attention or demand attention.

examples:

a) Adam says "up" as he lifts his arms up.

b) Nadine says "book" as she turns the pages of a book.

c) Rachel says "go" as she holds her doll on top of a toy car.

5. Modifier

definition: words that refer to properties or qualities of things or events.

examples:

a) Michael says "more" as he looks at the juice in his cup.

b) Rachel says "allgone" as she looks at her mother who just cut off Rachel's fingernail.

c) Jamie says "dirty" as she gives her mother a piece of hair from the bathtub.

6. Personal-social

definition: words that express affective states and accompany or are part of interactive routines.

examples:

a) Jamie says "hi" to the cameraman.

b) Jeremy says "no" in response to his mother's question "Are you cold?"

c) Lauren says "bow-wow" in response to her mother's question "What does the doggie say?"

7. Formula

definition: a sequence of two or more words which is an unanalyzed whole in the child's speech. The sequence may be produced without pauses between the words, with reduced phonemic articulation but have a distinct intonation pattern.

examples:

a) Rachel says "thank you" as she takes a piece of pizza from her mother.

b) Steven says "I did that" after he puts a shape into a

form board.

c) Adam points to a toy on a shelf and says "I want this one."

8. Formula Fragment

definition: a word or sequence of words which are part of a formula; they may be derived from songs, nursery rhymes, games, or other verbal routines.

examples:

a) Nadine says "what that" as she looks at a roll of paper towels hung near her changing table.

b) Adam's mother sings the phrase "happy birthday" and he responds by singing "to you."

c) Michael says "pocket" to initiate a game of Ring-around-the-Rosie with his mother. (The fragment is derived from the phrase "a pocket full of posies.")

9. Multi-word Utterance with a General Nominal

definition: a sequence of two or more words, each of which appears or is likely to appear as a single-word utterance in the child's speech and one of which is a general nominal.

examples:

a) Steven says "blue car" as he touches a toy car.

b) Jamie says "nice kitty" as she touches a toy cat.

c) Rachel says "more block" as she points to the blocks located a few feet from her.

10. Multi-word Utterance without a General Nominal

definition: a sequence of two or more words, each of which appears or is likely to appear as a single-word utterance in the child's

speech and neither of which is a general nominal.

examples:

a) Nadine empties water from her cup while in the bath and says "more this" while extending the empty cup to her mother.

b) Rachel says "Rachel up" as she extends her arms to her mother.

c) Nadine says "no more" as she puts the cover on the box of toys provided by the investigator.

11. Equivocal

definition: words which on the basis of context could be assigned to two of the categories of form.

examples:

a) Nadine and her mother are saying a nursery rhyme; Nadine shifts her gaze from her mother to the cameraman and says "haircut." (general nominal or action)

b) Michael looks at his mother and says "daddy" which can refer to either the cameraman present in the context or the child's father absent from the context. (specific nominal or general nominal)

Function

In the present investigation, the term "function" is defined as the purpose for which an utterance is used. Twenty-two categories of function, designed to span the entire second year, were identified. This taxonomy was constructed via the -etic to -emic process described in Bloom & Lahey (1978). The functional distinctions were designed to reflect especially Halliday's (1975) and Dore's (1974) categories,

although McShane's (1980) were considered as well.

The child's vocalizations that contained at least one consonant-like or vowel-like segment, but did not contain words (as defined earlier, pp. 44-46), were considered nonlinguistic. Crying, vegetative, or other physiological sounds the child produced were excluded. The utterances containing words were considered linguistic and were coded into the functional categories for the three observational sessions. The nonlinguistic utterances were transcribed and coded into the functional categories for Time I only.

Utterances were coded into the functional categories based on their relationship to the linguistic and nonlinguistic context including the child's actions and behaviors, the adult's actions and behaviors, the adult's prior utterance, and aspects of the nonlinguistic setting.

Two global orientation categories, personal-social and object oriented, which are broad-based uses of language, are defined and the specific functions of particular utterances subsumed under each broad category follow. The specific functional categories are then defined, the behavioral manifestations that accompany them are provided, and whether a function could be realized linguistically, nonlinguistically, or both ways are indicated for each. Examples from the data are provided for each function realized nonlinguistically and linguistically.

Personal-social functions

The use of language to express the feelings or activities of the speaker or to engage in interaction with others is personal-social in orientation. The following functions were considered personal-social.

1. Instrumental (Halliday, 1975)

definition: the child expresses desire for an object.

behavioral manifestations: the child attends to object; directs gaze to either the desired object or adult or shifts gaze from one to the other; may point to desired object and await adult response; utterance may be accompanied by whining or fussing.

realized through: nonlinguistic or linguistic form.

examples:

a) The child, seated in his highchair, gazes and points to a piece of chicken out of his reach on the kitchen table, vocalizes and shifts his gaze to his mother.

b) The child says "bottle" as she points to her bottle on a shelf and then looks at her mother.

c) The child says "mommy" while looking at her mother and pointing to a bottle of ketchup out of her reach on the kitchen counter.

2. Regulatory (Halliday, 1975)

definition: the child expresses desire for an adult to carry out an action.

behavioral manifestations: child attends to object or event; gazes at adult or object to be acted upon or shifts gaze between them.

realized through: nonlinguistic or linguistic form.

examples:

a) The child, standing in front of and touching apartment door, whines and shifts her gaze from door to her mother and vocalizes.

b) The child says "up" to his mother while he holds up

his arms.

c) The child says "mommy" as she gives her mother a toy which she has had difficulty operating.

3. Determination (McShane, 1980)

definition: the child expresses an action he is just about to carry out or might conceivably carry out.

behavioral manifestations: child attends to object or event; directs gaze to object or event; does not await adult response.

realized through: linguistic form.

examples:

a) The child says "boom" before he knocks down block tower.

b) The child says "I do" before he climbs the stairs of his slide.

c) The child says "out" before he takes a small figure from his clubhouse toy.

4. Doing (McShane, 1980)

definition: the child expresses an action he is performing, has just performed, or has attempted but was unable to perform.

behavioral manifestations: the child attends to an object if involved in the action; may not attend to adult; does not await adult response.

realized through: linguistic form.

examples:

a) The child says "bang" as he crashes two toy cars together.

b) The child says "go" as she releases a toy animal to go

down a slide.

c) The child says "can't" after failing to open a box of blocks she attempted to open.

5. Personal (Halliday, 1975)

definition: the child expresses his feelings regarding an event or state of affairs.

behavioral manifestations: child may not attend to adult or object; does not await adult response; child may exhibit non-vocal signs of affect.

realized through: nonlinguistic or linguistic form.

examples:

a) The child vocalizes as he struggles to climb on top of his sister's bed. He grimaces and sounds distressed as he vocalizes.

b) The child says "oh" as she clasps her hands together as she looks into a box of novel toys.

c) The child says "uh oh" as she stands at the top of a slide looking toward the bottom, then slides down head first.

6. Protest/Rejection (Dore, 1974; McShane, 1980)[3]

definition: the child expresses objection to the adult's actions, behaviors, requests, and suggestions.

behavioral manifestations: child attends to and addresses adult; directs gaze at adult or object; child resists or withdraws from adult's actions.

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[3]Dore's (1974) category was called Protesting. McShane (1980) used two separate categories, Refusal and Protest, for this function.

realized through: nonlinguistic or linguistic form.

examples:

a) The child's mother is dressing her, trying to put a shirt over the child's head. As the mother reaches for the shirt, the child produces a whining vocalization and gazes to the shirt her mother holds.

b) The child yells "no" as her mother tries to put on the child's shoes.

c) The child's older sister took one of her books. The mother extends another book to the child saying, "Here, Rachel, you could have this one." Rachel shakes her head, looks at her mother, and says "no."

7. Affirmation/Denial

definition: the child expresses compliance, agreement, or disagreement with the truth value of a prior adult comment, question, statement, or directive.

behavioral manifestations: child attends to prior adult utterance; may gaze to and address adult; child may nod or shake his head.

realized through: nonlinguistic or linguistic form.

examples:

a) The child and her mother are playing with blocks. The mother says "put one back!" The child then puts a block in the box, vocalizes and nods.

b) The mother is seated next to her child who has been rapidly turning the pages of her book. The mother says "you go through books fast." The child looks at her mother, nods, and says "yeah."

c) The mother is standing next to her child whom she has just dressed. The mother asks, "Jeremy, are you cold?" Jeremy looks at his mother and answers "no."

8. Interactional (Halliday, 1975)

definition: the child solicits attention or contact with another (excluding calls and greetings) or responds to another's soliciting attention or contact from him (excluding routines).

behavioral manifestations: the child attends to and directs gaze and utterance to adult; the child's utterance often precedes or follows the adult's.

realized through: nonlinguistic or linguistic form.

examples:

a) The child sits on her changing table and vocalizes while looking at her mother. The mother responds "what."

b) The child sits next to her mother looking at a book and says "mommy." The mother responds "what."

c) The child sits on a large stuffed animal moving back and forth. She looks at her mother and says "go." The mother then says "ready, set-."

9. Routine

definition: the child's utterance is a response to an adult's utterance including questions which express a game, nursery rhyme, song, or other "set interaction."

behavioral manifestations: the child responds to a prior adult utterance; the child may gaze to and address the adult.

realized through: linguistic form.

examples:

a) The child says "meow" in response to the adult question, "What does the cat say?"

b) The child says "three" in response to the adult's utterance, "one two."

10. Call (Dore, 1974)

definition: the child addresses another by uttering his name loudly.

behavioral manifestations: the adult is located some distance brom the child prior to the child's utterance; the child awaits the adult's response; the adult may attend to or answer the child and may change his orientation after the child's utterance.

realized through: linguistic form.

examples:

a) The child is seated in her highchair for lunch. The mother (off camera) is getting some food out of the refrigerator. The child utters "mommy" loudly. The mother says "what" and then walks over to her child.

b) The child and her mother are seated in the grass in their backyard. Their pet dog, Cacamun, is several feet away (off camera) in the neighbors backyard. The child orients herself in the direction of the dog and gazes toward him uttering "Caki" loudly. The mother then yells in the direction of the neighbor's yard, "Caki, come here."

11. Greeting (Dore, 1974)

definition: the child expresses a conventional greeting form to interact with a person or an object.

behavioral manifestations: the child attends to the adult or

object; the adult may respond to the child's greeting by issuing a greeting.

realized through: linguistic form.

examples:

a) The child says "bye" while waving to her mother.

b) The child picks up her shoe and says "hello" while gazing at it.

12. Show/Give/Take

definition: an utterance spoken while showing, giving, or receiving objects from another person. (This category was assigned only if there seemed to be no other purpose of the utterance such as labelling while showing, commenting while taking, etc.)

behavioral manifestations: the child extends or exchanges an object with an adult; the adult may acknowledge, take, or give the object to the child depending on the specific situation.

realized through: nonlinguistic or linguistic form.

examples:

a) The child picks up his toy train, walks toward the investigator, and vocalizes while giving her the train.

b) The child says "here" to the investigator (off camera) as she extends her pizza to the investigator.

c) The child picks up a doll shoe and says "this" as he extends it to his mother.

13. Answering (Dore, 1974; McShane, 1980)

definition: the child's utterance is a response to a prior adult question. (Linguistic utterances which were answers were double coded.)

behavioral manifestations: the child attends to the prior adult utterance; gazes to and addresses the adult.

realized through: nonlinguistic and linguistic form.[4]

examples:

a) The mother looks at her child who is holding a toy duck and says, "what's that?" The child gazes at her mother and vocalizes.

b) The mother and child are seated on the floor with blocks. The mother gazes to the child and says, "you wanna make something with me↑" The child picks up a block and vocalizes while gazing at her mother.

c) The mother looks at her child and says, "what's this↑" while holding a truck. The child looks at his mother and says, "car."

Object oriented functions

The use of utterances to represent or describe some aspect of the world was considered object oriented. In the present investigation, the following six functions were considered object oriented.

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[4]Linguistic utterances which were answers were double coded as answers and as the category of function they would be if self-initiated. For example, answers which were comments were coded as comments as well as answers. One exception to this double coding procedure was in the case of routines, some of which involved answers to questions. In one recurring type of routine, for example, the mother would ask "What does the duck say?" and the child might produce an animal sound. All such child utterances were coded as routines only, but all other linguistic answers were double coded. The child's nonlinguistic answers, on the other hand, were coded only as answers since their lack of content made it impossible to assign them to a second category.

14. Indicative

definition: the child's utterance refers to a present object without using its name.

behavioral manifestations: the child attends to an object; he gazes at the object or shifts his gaze between the object and an adult; the utterance may be accompanied by pointing to the object.

realized through: nonlinguistic or linguistic form.

examples:

a) The child vocalizes while gazing to and touching a toy car.

b) The child gazes and points to the light on the video equipment and says "this."

c) The child says "oh" while looking at a water toy which she holds in the bathtub.

15. Label (Dore, 1974)

definition: the child's utterance refers to a present object or person by name.

behavioral manifestations: the child attends to and gazes at the object or person; may shift gaze between the object or person referred to and another person in the context.

realized through: linguistic form.

examples:

a) The child picks up a duck, looks at it and says "duck."

b) The child seated in her highchair looks at the cameraman and says "daddy." Her mother replies "No, that's not daddy/Victor/Daddy's not here right now."

16. Comment (Bloom, 1970)

definition: the child refers to an observable aspect of an object or event including descriptions, actions, locations, and possessions.

behavioral manifestations: the child attends to the object or event; gazes at the object/event or adult or shifts gaze between them.

realized through: linguistic form.

examples:

a) The child extends a blue cup to his mother and says "blue."

b) The child picks up a truck, looks at it, and says "whee."

c) The child pushes her doll off of the coffee table so that it falls onto the floor. Her mother asks "what happened to the dollie?" The child, gazing and pointing to the floor then shifting her gaze to her mother, says "down." Her mother replies "down/dollie went down."

17. Heuristic (Halliday, 1975)

definition: the child refers to or seeks unknown information about an object or event including requests for names.

behavioral manifestations: the child attends to an object or event; gazes at the object/event or adult or shifts gaze between them; the utterance may be accompanied by pointing and a rising intonation.

realized through: nonlinguistic or linguistic form.

examples:

a) The child touches the Mickey Mouse figure on her Poppin Pals toy and vocalizes with a rising intonation while looking at her mother who replies "Mickey Mouse."

b) The child looks at and picks up a toy boat and says "what that↑" Her mother responds "that's a boat."

c) The child looks at and points to a boat and says "car↑" His mother picks up the boat and says "that's not a car/ what is this↑/a boat."

18. Informative (Halliday, 1975; McShane, 1980)

definition: the child refers to a nonpresent object, person, or event.

behavioral manifestations: the child attends and directs gaze to adult.

realized through: linguistic form.

examples:

a) The child looks at his mother while in the bath holding a water toy and says "dad." The mother replies "dad's not here."

b) The child points to the window and says "police." The mother replies "police car/you hear a police car↑" (No sirens or other vehicular sounds were audible in the context.)

19. Imaginative (Halliday, 1975)

definition: the child's utterance is used for pretend play or make believe.

behavioral manifestations: the child may not attend to anyone or anything in particular; interactions with objects that accompany the utterance may be symbolic.

realized through: nonlinguistic or linguistic form.

examples:

a) The child vocalizes while holding the telephone to his ear.

b) The child vocalizes while rocking a doll in her arms.

c) The child says "okay" while pretending to talk on the telephone.

d) The child stands in the tub and extends a boat to her mother and says "teddy" while smiling. The mother replies "it's not teddy/you're silly."

e) The child stands in front of her play stove pretending to cook. She gazes at and lifts the cover of her pot and says "hot."

Other functions

The following three categories were useful in coding some of the data, but they were not relevant to either of the global orientation categories.

20. Repeating (Dore, 1975)

definition: the child's imitative[5] utterance serves none of the above functions.

behavioral manifestations: the child attends to the adult utterance before his utterance, may not address the adult, and does not await response. A change in the context is unlikely as the utterance,

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[5]The definition of imitation used in this study was adapted from Bloom, Hood, & Lightbown (1974). In this study, an utterance was considered imitative if it contained all or part of a preceding utterance said by someone else and did not add to the model utterance. Further, no more than five utterances from the child or others could intervene after the model. Spontaneous and elicited imitations were not distinguished in the present investigation.

rather than the situation, is focussed on.

realized through: linguistic form.

examples:

a) The mother touches the letters on the wall hanging situated near the child's crib labelling each one in turn "ABC." The child gazes at and touches a toy train on the ledge of his crib and says "B."

b) During breakfast the child's older sister instructs her to "say woof-woof." The child sitting in her highchair says "woof."

c) The mother pours juice into the child's cup and say "what do you say↑" The child, holding the cup to her mouth, gazes to her mother and says "what you say."

21. Equivocal

definition: the child's utterance, on the basis of its relationship to the context, can plausibly be coded into any two of the above categories.

realized through: nonlinguistic and linguistic form.

examples:

a) The child, who just finished dinner, vocalizes and points to his bib which his mother holds. The mother responds "that's your bib." (The child's utterance could be instrumental or indicative.)

b) The child vocalizes with a rising intonation while climbing the stairs to his slide and is looking at the cameraman. The mother replies "that's a camera." (The child's utterance could be interactional or heuristic.)

c) The child looks at her mother and says "Howie," her father's name. The mother replies "Howie/I'm not Howie." (The child's utterance could be informative referring to her absent father or a label in which the child has over-generalized her father's name to her mother.)

d) The child gazes to and touches the door of a toy car, picks up the car and says "key." (The child's utterance could be a comment describing the relationship between car and key or instrumental expressing that the child wanted the keys for the car. Toy keys were among the objects present in this context.)

22. Ambiguous

definition: an utterance whose form is interpretable, but whose function cannot be discerned from the linguistic and/or nonlinguistic context.

realized through: nonlinguistic and linguistic forms.

examples:

a) The child vocalizes while lying on her back on the changing table while her mother changes her diaper.

b) The child vocalizes while touching his boat to the water dock while taking a bath.

c) The child vocalizes while climbing up his slide with gaze to the steps as he climbs.

d) The child says "up" while gazing to and holding the doll's shoe to the doll's foot.

e) The child says "oh" while sitting on the changing table after her father brushed her hair. Both parents block the child's visibility during the utterance.

It was sometimes difficult to make the distinctions among the categories. There were fine lines between many of them such as the instrumental and regulatory. The guidelines presented here were used to enable the investigator to make the best possible choices.

Reliability

The reliability of the codings was determined for approximately 10% of the data by having a trained observer code 30 minute segments of six different videotapes arranged so that one boy and one girl from each of the time periods and a variety of contexts were represented in the samples. The rater followed the procedures of the investigator by a) coding from the tapes in conjunction with the transcripts, b) coding nonlinguistic utterances in Time I for function, and c) coding linguistic utterances in all three time periods for form and function. Reliability was measured by percent agreement of the codings for the a) functions of nonlinguistic utterances in Time I, b) functions of linguistic utterances for all three observations, and c) forms of linguistic utterances for the three observations.

Results of the reliability codings were calculated separately for the nonlinguistic and linguistic utterances. The reliability of the transcript was determined by the percent agreement between the number of utterances transcribed by the investigator and trained observer. This percent of agreement was .97 for the number of nonlinguistic utterances and .95 for the number of linguistic utterances. The reliability of the codings of form for the linguistic utterances ranged from .89 to .97 with a mean of .93. The reliability of the codings of function of the linguistic utterances ranged from .78 to .85 with a mean of .83. The reliability of the codings of function of the nonlinguistic utterances

was .70 and .72 for the two Time I observations.

Analyses

The following analyses of the data were performed to answer the ten research questions presented earlier.

Personal-social and object oriented functions

The first three research questions are concerned with whether or not there is a predominance of either personal-social or object oriented functions in the child's linguistic utterances at Times I, II, and III, respectively. To answer this question, utterances were coded into the individual functional categories. The absolute and proportional frequencies of utterances in the individual functional categories and global functional orientation categories were determined for each subject. Any significant difference between the proportion of personal-social and object oriented functions was considered indicative of a predominant functional orientation for that observation. Chi square (Guilford & Fruchter, 1973) was used to determine significance.

In this study, answers were the child's responses to questions posed by the adult with whom the child was interacting in a particular context. The child's answer is an utterance elicited by another, usually the mother in the present investigation. One can argue that answers, because they are responses to another's input rather than being self-initiated, reflect the inclination of the child's interlocutor more than that of the child himself. Since this study was primarily concerned with the inclinations of the child toward using one group of functions over another, it was felt that in addition to determining the functional orientation of each child with answers absorbed into their respective

categories, for example, coding answers which were labels as labels, the data should also be analyzed with answers separated out from the self-initiated utterances to determine whether or not the children's functional preferences were being influenced by the mother's questions. The data relative to the first three research questions only were analyzed these two ways.

Continuity between nonlinguistic and linguistic utterances

The fifth research question concerns continuity between the functions of nonlinguistic and linguistic utterances at the beginning of the single-word utterance period. To answer this question, nonlinguistic and linguistic utterances at Time I were coded into one of the individual categories of function.

If both a nonlinguistic and linguistic form occurred within the same utterance boundary, the utterance was coded as linguistic only. The rationale for coding such utterances this way was that the study was primarily concerned with the child's use of words and there was a greater volubility of nonlinguistic than linguistic utterances at Time I.

The absolute and proportional frequency of personal-social and object oriented functions realized through nonlinguistic and linguistic utterances was determined. Chi squares reflecting the proportional frequency of use of personal-social and object oriented nonlinguistic and linguistic utterances were obtained. There were two criteria for a continuous relationship:

1) The same functional orientation category had to account for the majority of the child's nonlinguistic and linguistic utterances.

2) The chi square value reflecting the difference between the

proportion of personal-social and object oriented functions realized nonlinguistically as compared with linguistically had to be non-significant ($p > .05$). There were two criteria for a discontinuous relationship:

1) a difference in which of the two functional orientations, personal-social or object oriented, accounted for the majority of a child's use of his nonlinguistic as compared with linguistic utterances at Time I, and

2) a significant different ($p < .05$) in the relationship between the proportion of personal-social and object oriented functions realized nonlinguistically as compared with linguistically.

General nominal use and lexical style

The sixth research question concerns the relationship between lexical style (that is, referential and expressive, Nelson, 1973) and the frequency of use of general nominals when the child has a vocabulary of about 50 words. For each subject, the percent of general nominals in the cumulative vocabulary record and in the third videotaped session were compared. The data from the cumulative vocabulary records represented individual lexical items or "types." The number of multi-word utterances containing a general nominal was added to the number of general nominal single-word forms to yield the total number of general nominals for each subject for the Time III session since that was the only sample by which the child had used at least 50 different words.

The proportion of general nominal types in the cumulative vocabulary records was compared with 1) the proportion of general nominal

tokens and 2) the proportion of general nominal types used at Time III. For the percentages from these different data bases to be considered consistent with each other, the percent of general nominals in both the cumulative vocabulary record and third observational session had to be either greater or less than 50% and the difference had to be non-significant ($p > .05$) based on the Z Test for Independent Proportions (Guilford & Fruchter, 1973).

General nominal use and functional orientation

To determine if general nominals were used for more object oriented or personal-social functions, with respect to the seventh research question, the variables form and function were cross-tabulated for each subject for the three observations. The absolute and proportional frequency of use of general nominals used for object oriented and personal-social functions were compared.

Form and function

To determine the most frequently used form/function combinations in the single-word period, the concern of the eighth research question, all the categories of form described earlier were cross-tabulated with the individual functional categories for each subject for the three observations. The absolute and relative frequency of each form/function combination was computed for each subject for each time period. A productivity criterion for a form/function combination to be reported in the Results was established at a minimum of five occurrences. A form/function combination occurring fewer than five times was reported if it accounted for at least 10% of an

individual subject's data. For each subject, the three most frequently used form/function combinations were reported in the Results. Less frequently occurring form/function interactions were listed in an appendix.

Unifunctional and multifunctional interactions

The ninth research question explores the question of form/function interaction in terms of unifunctional or multifunctional uses of words. The investigator determined if particular words were tied to particular functions for individual children, as suggested by Halliday (1975), or if words were used for more than one function. This question was examined for Time I only since that was the approximate developmental level for which Halliday had suggested a one to one relationship between form and function. The investigator computed the number of different functions realized by a particular word produced at least two times in the sample. The number of words serving one function was compared with the number of words serving more than one function for each child and for the group.

Cognitive development

The tenth research question concerns the relationship between level of means-end cognitive abilities and both lexical and functional style. The sensorimotor cognitive levels for each child were examined in terms of the 1) referential or expressive designations based on each child's cumulative vocabulary record and 2) type of functions, either personal-social or object oriented, which accounted for the majority of each child's utterances at each observation.

Maternal speech style

A post hoc analysis of a portion of maternal speech was performed for the mothers whose children demonstrated a predominant functional orientation that was consistent for the three observations. The data for this analysis was taken from a ten minute time sampled segment derived from 5 minutes of an interpersonal context, bathing the child, and 5 minutes of an object oriented one, playing with the box of toys provided by the investigator. The mother's sample was taken from the Time I observation to determine if features of a mother's speech at an early point in lexical development were related to the lexical style her child developed at the 50 word level.

The mother's utterances were coded as to the presence or absence of features designed to reflect the degree to which the mothers' talk is focussed on objects. The codings of the mother's speech and examples are provided below.

1. Utterance with a general nominal

The mothers' utterances were coded as to whether or not they contained general nominals. A general nominal is defined as a word other than a pronoun used to refer to all members of a category.

examples:

a) where's your washcloth/

b) see the hat/

2. Utterance refers to an object

The mothers' utterances were coded as to whether or not they referred to objects.

examples:

a) what's in there/

b) can you open the box/

3. Utterance with an object oriented function

The mothers' utterances were coded as to whether or not they served an object oriented function such as indicating objects, labelling, commenting, describing objects, requesting labels and information about objects.

examples:

a) what's that/

b) the light is dangerous/

Each utterance was coded for all three features. Maternal utterances such as "thank you" and "oh, look" which did not contain the features were included in the totals. The absolute and proportional frequency of the above codings was computed for mothers whose children had a consistent functional style throughout the study. The degree of object orientation in the mothers' language in terms of these three measures was analyzed for consistency with the degree of object orientation in their children's functions and early vocabulary. The Z Test for Independent Proportions (Guilford & Fruchter, 1973) was used to determine if any of the differences between the mothers on the three measures was significant.

The reliability of these codings was determined by having a trained observer code 10% of the utterances of any mother on whom the post hoc analysis was performed. Half of the utterances were taken from the bath context and half from the play situation. Reliability of these codings was 1.00.

CHAPTER IV

RESULTS

The observational data for the present study consisted of a total of 4,067 utterances, 1,533 nonlinguistic ones obtained during the Time I observation and 2,534 linguistic ones obtained from Times I, II, and III. The distribution of utterances across the three observations for the eight subjects, the duration of the videotaped observations, and the volubility for each session appears in Table 3. For all children, there was a greater volubility of nonlinguistic than linguistic utterances during the Time I observation. In terms of the linguistic utterances, volubility increased from the first to the last session for all children, although for five of them, volubility decreased from Time I to Time II.

Personal-social Vs. Object Oriented Functions

The first three research questions are concerned with whether or not there was a predominance of either personal-social or object oriented functions during the beginning, middle, and end of the one-word stage as defined in this study. To determine the frequency of use of functions in these two global categories, utterances were first assigned to one of the twenty-two functional categories described in the Procedures. The absolute and proportional frequencies for the individual functional categories for each subject are listed in

TABLE 3

THE DISTRIBUTION OF NONLINGUISTIC AND LINGUISTIC UTTERANCES PRODUCED BY EACH CHILD DURING THE THREE OBSERVATIONS, THEIR DURATIONS, AND THE VOLUBILITY FOR EACH SESSION

Subject/Observation	Number of Utterances	Duration in Minutes	Volubility (Utterances/ Minutes)
Michael I			
nonlinguistic	232	74	3.14
linguistic	33	74	.45
Michael II	137	81	1.67
Michael III	144	83	1.73
Steven I			
nonlinguistic	255	78	3.27
linguistic	116	78	1.49
Steven II	115	84	1.37
Steven III	238	84	2.83
Jeremy I			
nonlinguistic	183	76	2.41
linguistic	30	76	.39
Jeremy II	12	82	.15
Jeremy III	162	81	2.00
Adam I			
nonlinguistic	161	111	1.45
linguistic	27	111	.24
Adam II	20	92	.22
Adam III	103	79	1.30
Jamie I			
nonlinguistic	146	78	1.87
linguistic	21	78	.27
Jamie II	104	87	1.20
Jamie III	217	85	2.55
Nadine I			
nonlinguistic	145	80	1.81
linguistic	131	80	1.64
Nadine II	88	84	1.04
Nadine III	349	90	3.88
Lauren I			
nonlinguistic	152	84	1.81
linguistic	47	84	.56
Lauren II	33	90	.37
Lauren III	103	84	1.23
Rachel I			
nonlinguistic	259	85	3.05
linguistic	56	85	.66
Rachel II	116	91	1.27
Rachel III	132	84	1.57

Table 4. In analyzing the results, proportions were rounded to the nearest hundredth. Consequently, proportions reported throughout the results do not always add up to 1.00. For the first observation, the beginning of the single word utterance period, five of the children used their words for more object oriented functions, however the difference was statistically significant for only two of them (see Figure 1). The other three children displayed more personal-social uses of words, but the difference was statistically significant for only one of them. Thus, significant differences in the frequency of use of personal-social and object oriented functions were obtained for only three of the children. The difference was not significant for the other five. With respect to the first research question, some children displayed a predominant functional orientation in the beginning of the single word utterance period and for most of them, there was a tendency toward more object oriented uses of words.

In the second observation, when the children had between 25 and 40 words, personal-social uses of language accounted for the majority of functions for six of the children with statistically significant differences for four. The other two children had more object oriented utterances, but the difference was statistically significant for only one of them. In answer to the second research question, significant differences in the use of personal-social and object oriented functions occurred in five of the children's observations indicating that some children displayed a predominant functional orientation in the middle of the single word period. Further, there was an increase in the proportional use of personal-social functions

TABLE 4

THE ABSOLUTE AND PROPORTIONAL FREQUENCY OF EACH CHILD'S USE OF INDIVIDUAL FUNCTIONS FOR THE THREE OBSERVATIONS

Function	MICHAEL Nonlinguistic	MICHAEL Linguistic			STEVEN Nonlinguistic	STEVEN Linguistic		
	I	I	II	III	I	I	II	III
Personal-social								
Instrumental	52 (.22)	3 (.09)	19 (.14)	37 (.26)	26 (.10)	6 (.05)	5 (.04)	23 (.10)
Regulatory	13 (.06)	1 (.03)	21 (.15)	11 (.08)	9 (.04)	3 (.03)	2 (.02)	1(.01)
Determination			1 (.01)	1 (.01)				
Doing			9 (.07)	8 (.06)			10 (.09)	6 (.03)
Personal	13 (.06)		1 (.01)		18 (.07)	3 (.03)		1(.01)
Protest/Rejection	21 (.09)			2 (.02)	9 (.04)	2 (.02)	1 (.01)	15 (.05)
Affirmation/Denial				2 (.02)	7 (.03)	2 (.02)	6 (.05)	7 (.03)
Interactional	11 (.05)		16 (.12)		20 (.08)	1 (.01)	3 (.03)	
Routine			3 (.02)	7 (.05)		2 (.02)		1(.01)
Call		1 (.03)	3 (.02)	5 (.04)				1(.01)
Greeting						3 (.03)	1 (.01)	10 (.04)
Show/Give/Take	39 (.17)		1 (.01)		22 (.09)	3 (.03)	9 (.08)	3 (.01)
Answering	12 (.06)				7 (.03)			
Sub-Total	161 (.69)	5 (.15)	74 (.54)	73 (.51)	118 (.46)	25 (.22)	37 (.32)	68 (.29)
Object-oriented								
Indicative	27 (.12)				67 (.26)	53 (.46)	23 (.20)	8 (.03)
Label		10 (.30)	31 (.23)	39 (.27)		11 (.10)	37 (.32)	88 (.37)
Comment		7 (.21)	12 (.09)	9 (.06)		3 (.03)	3 (.03)	30 (.13)
Heuristic	6 (.03)		3 (.02)	9 (.06)	8 (.03)	16 (.14)	14 (.12)	22 (.09)
Informative		4 (.12)	1 (.01)	2 (.01)		1 (.01)		8 (.03)
Imaginative	1(.01)						1 (.01)	5 (.02)
Sub-Total	34 (.15)	21 (.64)	47 (.34)	59 (.41)	75 (.29)	84 (.72)	78 (.68)	161 (.68)
Other								
Repeating	1 (.01)	7 (.21)	9 (.07)	11 (.08)				3 (.01)
Equivocal	14 (.06)				19 (.08)	2 (.02)		3 (.01)
Ambiguous	22 (.10)		7 (.05)	1 (.01)	43 (.17)	5 (.04)		3 (.01)
Sub-Total	37 (.16)	7 (.21)	16 (.12)	12 (.08)	62 (.24)	7 (.06)	0 (.00)	9 (.04)
Total N of Utterances	232(1.00)	33(1.00)	137(1.00)	144(1.00)	255 (.99)	116(1.00)	115(1.00)	238(1.01)

Function	JAMIE Nonlinguistic	JAMIE Linguistic			NADINE Nonlinguistic	NADINE Linguistic		
	I	I	II	III	I	I	II	III
Personal-social								
Instrumental	27 (.18)	1 (.05)	9 (.09)	13 (.06)	1 (.01)	6 (.05)	1 (.01)	8 (.02)
Regulatory	7 (.05)		4 (.04)	19 (.09)	2 (.01)	3 (.02)	1 (.01)	28 (.08)
Determination			5 (.05)	2 (.01)		1 (.01)	1 (.01)	3 (.01)
Doing		2 (10)	6 (.06)	21 (.10)		3 (.02)		25 (.07)
Personal	5 (.03)		2 (.02)	2 (.01)	20 (.14)	22 (.17)	4 (.05)	6 (.02)
Protest/Rejection	33 (.23)	1 (.05)	13 (.13)	10 (.04)	25 (.17)	3 (.02)	8 (.09)	44 (.13)
Affirmation/Denial			1 (.01)			2 (.02)	6 (.07)	31 (.09)
Interactional	3 (.02)		2 (.02)	1 (.01)	18 (.12)	6 (.05)	7 (.08)	5 (.01)
Routine			7 (.07)					17 (.05)
Call			7 (.07)	5 (.02)				8 (.02)
Greeting		6 (.29)	11 (.11)	41 (.19)		19 (.15)	9 (.10)	13 (.04)
Show/Give/Take	7 (.05)		1 (.01)	8 (.04)	3 (.02)		3 (.03)	3 (.01)
Answering	10 (.07)				4 (.03)			
Sub-Total	92 (.63)	10 (.45)	68 (.65)	122 (.56)	73 (.50)	65 (.50)	40 (.45)	191 (.55)
Object-oriented								
Indicative	20 (.14)	3 (.14)	4 (.04)		26 (.18)	15 (.12)	11 (.13)	
Label		1 (.05)	16 (.15)	43 (.20)		16 (.12)	22 (.25)	91 (.26)
Comment		2 (.10)	5 (.05)	24 (.11)		8 (.06)	11 (.13)	29 (.08)
Heuristic		2 (.10)		7 (.03)	1 (.01)	10 (.08)	2 (.02)	7 (.02)
Informative				3 (.01)				6 (.02)
Imaginative			1 (.01)		22 (.15)	8 (.06)	1 (.01)	6 (.02)
Sub-Total	20 (.14)	8 (.38)	26 (.25)	77 (.36)	49 (.34)	57 (.44)	47 (.53)	139 (.40)
Other								
Repeating			1 (.01)	3 (.01)		2 (.02)		3 (.01
Equivocal	11 (.08)	3 (.14)		2 (.01)	6 (.04			
Ambiguous	23 (.16)		9 (.09)	13 (.06)	17 (.12)	7 (.05)	1 (.01)	16 (.05
Sub-Total	34 (.23)	3 (.14)	10 (.10)	18 (.08)	23 (.16)	9 (.07)	1 (.01)	19 (.05
Total N of Utterances	146(1.00)	21(1.00)	104(1.00)	217(1.00)	145(1.00)	131(1.01)	88(.99)	349(1.00

JEREMY

Nonlinguistic	Linguistic		
I	I	II	III
11 (.06)	3 (.10)	1 (.08)	
5 (.03)	3 (.10)		3 (.02)
			1 (.01)
	1 (.03)	9 (.75)	16 (.10)
14 (.08)	1 (.03)		
16 (.09)	4 (.13)		55 (.34)
			6 (.04)
14 (.08)	7 (.23)		10 (.06)
		1 (.08)	4 (.03)
	2 (.07)	1 (.08)	
	1 (.03)		
27 (.15)	6 (.20)		2 (.01)
21 (.12)			
108 (.59)	28 (.93)	12(1.00)	97 (.60)
48 (.26)			1 (.01)
			31 (.19)
	1 (.03)		29 (.18)
	1 (.03)		
1 (<.01)			
49 (.27)	2 (.07)	0 (.00)	61 (.38)
11 (.06)			4 (.03)
15 (.08)			
26 (.14)	0 (.00)	0 (.00)	4 (.03)
183(1.00)	30(1.00)	12(1.00)	162(1.00)

ADAM

Nonlinguistic	Linguistic		
I	I	II	III
20 (.12)	8 (.30)	5 (.26)	14 (.14)
17 (.11)	4 (.15)	5 (.26)	13 (.13)
	1 (.04)	1 (.05)	3 (.03)
			4 (.04)
39 (.24)			
12 (.08)			18 (.17)
			1 (.01)
4 (.03)			
			1 (.01)
			4 (.04)
			4 (.04)
2 (.01)			3 (.03)
1 (.01)			
95 (.59)	13 (.48)	11 (.58)	65 (.63)
29 (.18)	3 (.11)	3 (.16)	3 (.03)
	5 (.19)	3 (.16)	15 (.14)
	1 (.04)		16 (.15)
13 (.08)	5 (.19)	2 (.11)	3 (.03)
			1 (.01)
42 (.26)	14 (.52)	8 (.42)	38 (.37)
1 (.01)			
1 (.01)			
22 (.14)			1 (.01)
24 (.15)	0 (.00)	0 (.00)	1 (.01)
161(1.00)	27(1.00)	19(1.00)	104(1.01)

LAUREN

Nonlinguistic	Linguistic		
I	I	II	III
18 (.12)	2 (.04)	2 (.06)	7 (.07)
2 (.01)	1 (.02)	3 (.09)	6 (.06)
	1 (.02)		1 (.01)
	10 (.21)	3 (.09)	2 (.02)
13 (.09)	2 (.04)	1 (.03)	
15 (.10)		1 (.03)	13 (.05)
2 (.01)	1 (.02)	1 (.03)	3 (.11)
8 (.05)			
		4 (.12)	12 (.12)
		3 (.09)	2 (.02)
	1 (.02)	1 (.03)	6 (.06)
4 (.03)	1 (.02)		1 (.01)
10 (.07)			
72 (.47)	19 (.40)	19 (.58)	53 (.51)
29 (.19)	1 (.02)	2 (.06)	5 (.05)
	6 (.13)	1 (.03)	22 (.22)
	6 (.13)	2 (.06)	4 (.04)
2 (.01)	15 (.32)	1 (.03)	10 (.10)
2 (.01)		1 (.03)	5 (.05)
33 (.22)	28 (.60)	7 (.21)	46 (.45)
2 (.01)		4 (.12)	
1 (.01)			
44 (.29)		3 (.09)	4 (.04)
47 (.31)	0 (.00)	7 (.21)	4 (.04)
152(1.00)	47(1.00)	33(1.00)	103(1.00)

RACHEL

Nonlinguistic	Linguistic		
I	I	II	III
23 (.09)	2 (.04)	8 (.08)	11 (.08)
4 (.02)	2 (.04)	6 (.05)	3 (.02)
	1 (.02)		3 (.02)
	1 (.02)	8 (.07)	5 (.04)
6 (.02)	1 (.02)	3 (.03)	5 (.04)
18 (.07)		3 (.03)	11 (.02)
	1 (.02)	4 (.03)	1 (.01)
25 (.10)		1 (.01)	4 (.03)
	10 (.18)	14 (.12)	5 (.04)
		4 (.03)	4 (.03)
	1 (.02)	3 (.03)	11 (.08)
27 (.10)	2 (.04)	3 (.03	5 (.04)
17 (.07)			
120 (.46)	21 (.38)	57 (.49)	68 (.52
83 (.32)	3 (.05)		
	9 (.16)	17 (.15)	29 (.22)
	18 (.32)	15 (.13)	16 (.12)
		2 (.02)	1 (.01)
			1 (.01)
2 (.01)	1 (.02)	5 (.04)	
85 (.33)	31 (.55)	39 (.34)	47 (.36)
2 (.01)	4 (.07)	18 (.16)	15 (.11)
16 (.06)			
36 (.14)		2 (.02)	2 (.02)
54 (.21)	4 (.07)	20 (.17)	17 (.13)
259(1.00)	56(1.00)	116(1.00)	132(1.00)

Fig. 1. The absolute and proportional frequency of linguistically realized functions in the personal-social and object oriented categories and the significance of the difference between them based on chi square. (df = 1)

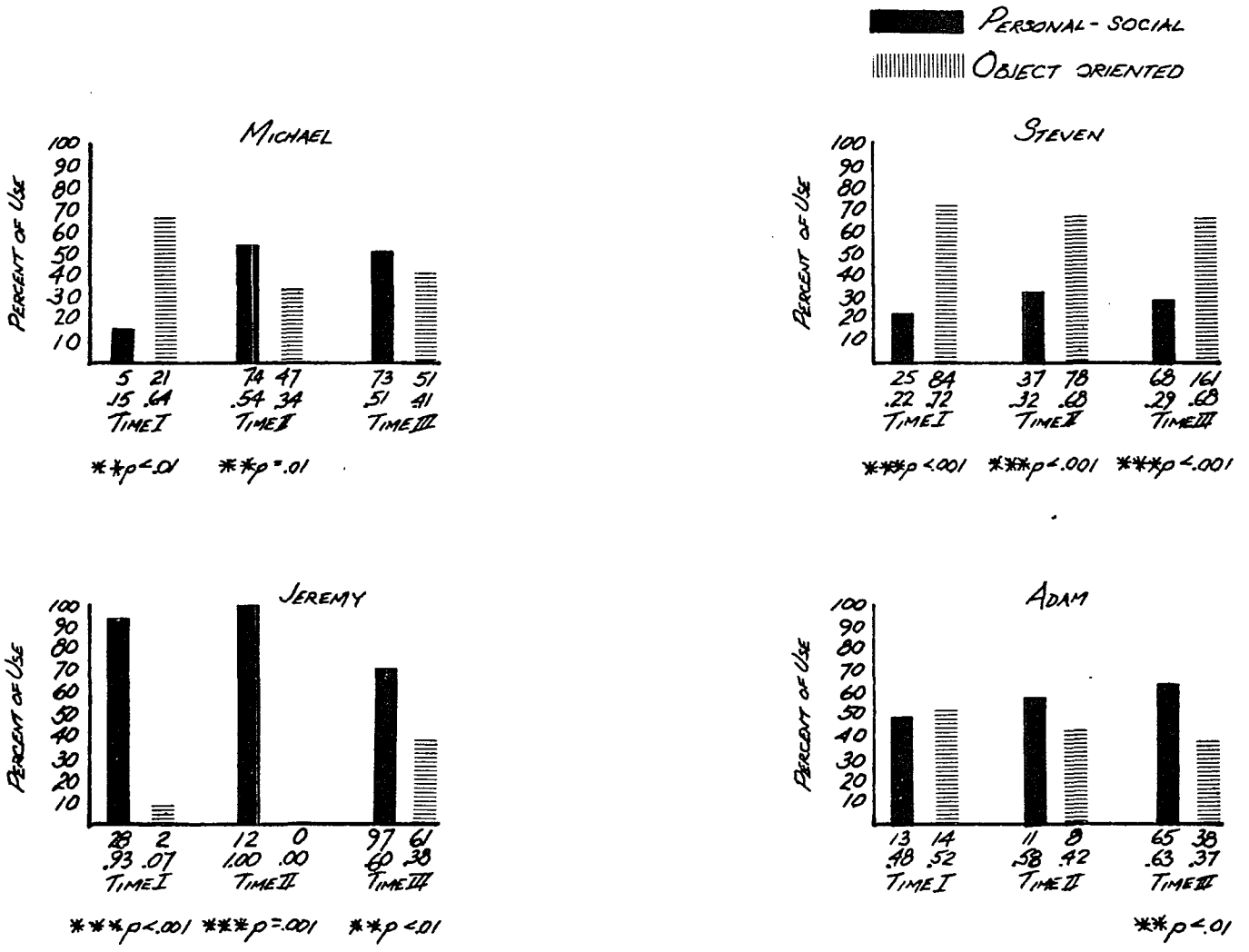
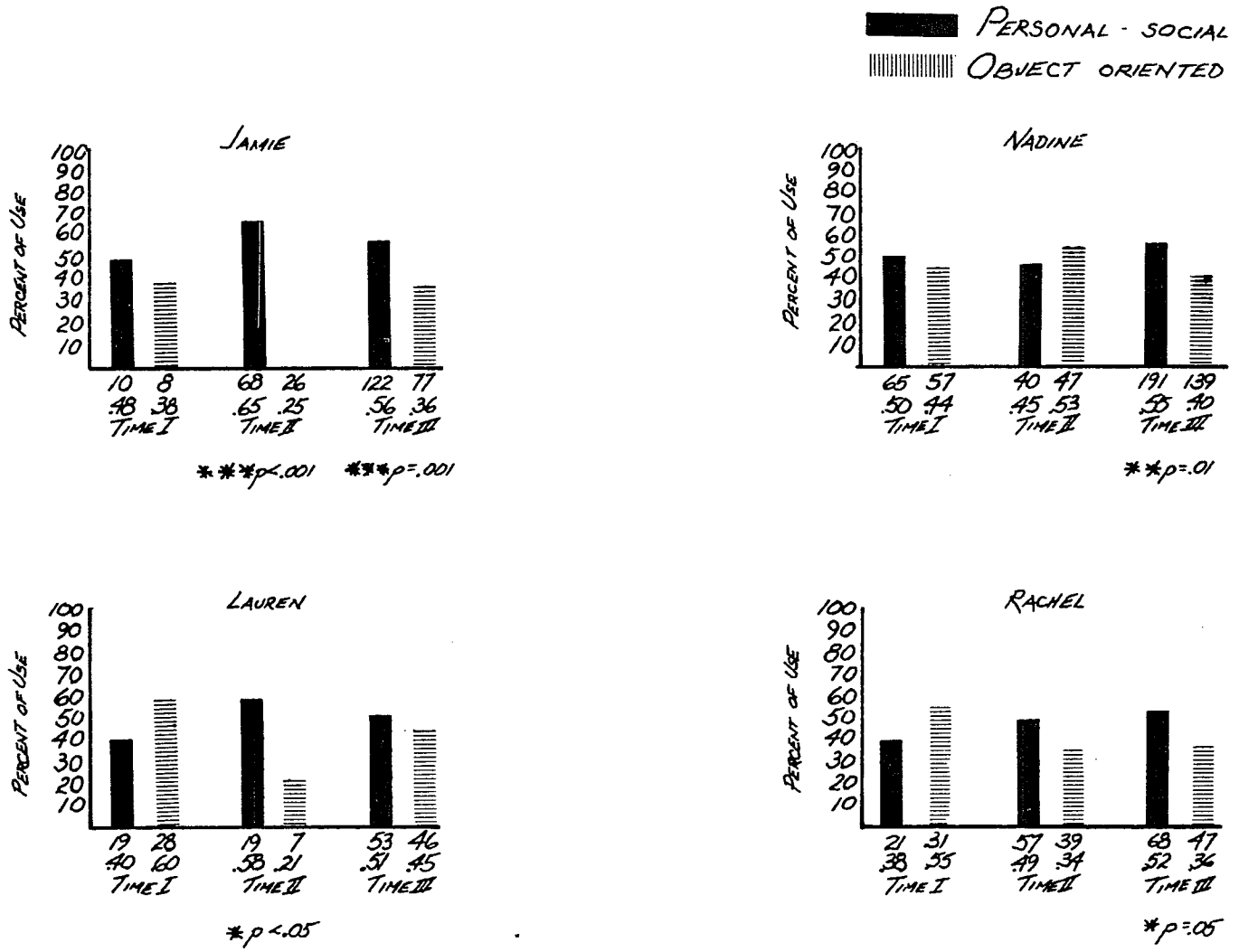


Fig. 1 - Continued



over Time I for all but one child suggesting a tendency toward more personal-social uses of words at that time.

For the last observation, when the children had at least 50 words, personal-social functions accounted for the majority of language uses for seven of the children with statistically significant differences for six. Only one child used mostly object oriented functions and the difference was significant. In terms of the third research question, significant differences emerged in six of the samples indicating that most of the children had a predominant functional orientation. Further, the tendency at Time III, as in Time II, was toward more personal-social uses of language.

The data as a whole suggest variability in language functions throughout the entire single word utterance period. In answer to the fourth research question, two of the children had a predominance of the same type of functions for all three observations, one child displaying an object oriented style and the other, personal-social. However, most of the children's functional development was characterized by a shift from more object oriented to more personal-social uses of language over time. There was also a tendency toward more significant differences between the two functional orientation categories over time with only three in the first observation, five in the second, and six in the third.

Personal and Social Oriented Functions

Five of the children used mostly object oriented functions in the beginning of the single-word period and mostly personal-social functions at the end of the single-word period. To more fully explore this pattern of shift in functional emphasis over time, a post hoc

distributional analysis was performed in which the personal oriented functions were separated from the social oriented ones (see Table 5). For this analysis, the determination, doing, and personal functions were considered personal in that these three functions involve the child's talking about his own feelings or actions. The remaining personal-social functions were considered social in that they involve the child in social interaction. The results indicated that four of the five children displaying a shift in emphasis from object oriented to personal-social had a steady increase in the social uses of language over time (see Figure 2). The pattern for the other child, Michael, showed an increase in the social uses of language from Time I to Time II and a slight decrease from Time II to Time III. This trend in increased social uses of language over time was significant ($p<.01$) based on χ^2_r, the Friedman two way analysis variance by ranks (Siegel, 1956).

The results for the personal oriented functions did not reflect an increase over time (see Table 5). There were increases, decreases, and no change in their frequencies which seemed randomly distributed among the children and not to follow any consistent developmental pattern. In conclusion, the results of the post hoc analysis indicate that the pattern of functional preference observed in the five children who shifted from an object oriented to personal-social functional emphasis was related to their increasing use of language for social purposes.

The Influence of Answers on the Data

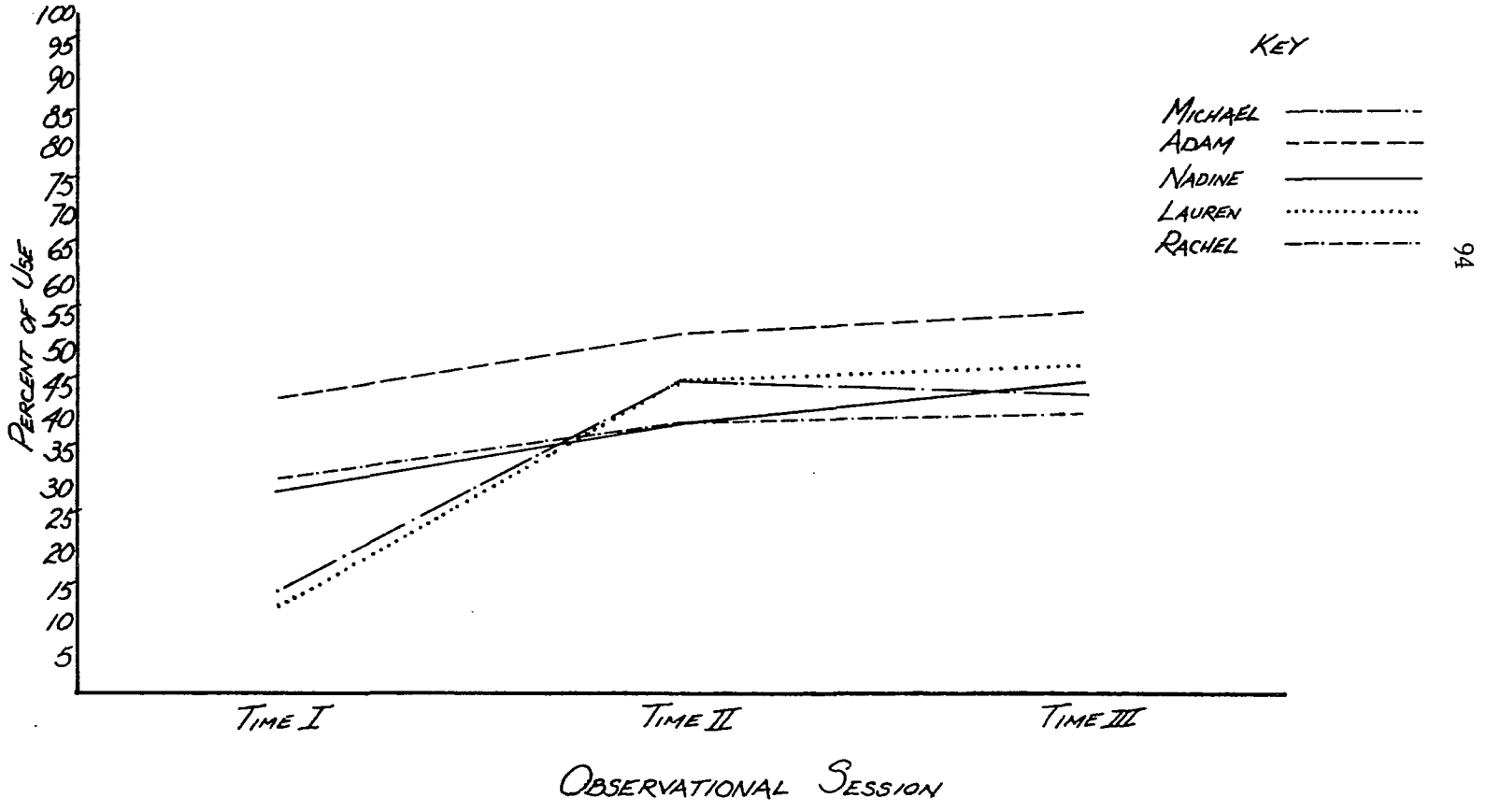
To obtain a corpus of utterances most representative of the child's non-elicited functions, the data were analyzed with answers

TABLE 5

THE ABSOLUTE AND PROPORTIONAL FREQUENCY OF PERSONAL AND SOCIAL FUNCTIONS FOR THE FIVE CHILDREN WHO SHIFTED FROM A MAJORITY OF OBJECT ORIENTED FUNCTIONS AT TIME I TO A MAJORITY OF PERSONAL-SOCIAL FUNCTIONS AT TIME III

	Time I		Time II		Time III	
Subject	Personal	Social	Personal	Social	Personal	Social
Michael		5(.15)	11(.08)	63(.46)	9(.06)	64(.44)
Adam	1(.04)	12(.44)	1(.05)	10(.53)	8(.42)	58(.56)
Nadine	26(.20)	39(.30)	5(.06)	35(.40)	34(.10)	157(.45)
Lauren	13(.28)	6(.13)	4(.12)	15(.46)	3(.03)	50(.49)
Rachel	3(.05)	18(.32)	11(.10)	46(.40)	13(.10)	55(.42)
Mean	$\overline{X}$	.27		.45		.47

Fig. 2. The proportional frequency of social oriented uses of language for the five children who shifted from an early object orientation to a later personal-social orientation in linguistically realized functions.



to questions separated from other functions. The distributional frequency of answers for each subject across time appears in Table 6. For the nonlinguistic utterances at Time I, the relative frequency of answers ranged from a low of 4% for Michael to a high of 18% for Jeremy. None of Jeremy's words, however, were used as answers in the same time period. Of all the children, Michael and Adam had the highest proportion (15%) of linguistic answers in Time I. For the second observation, the relative frequency of answers ranged from a low of 6% for Lauren to a high of 37% for Adam. At Time III, the relative frequency of answers accounted for a low of 10% of the data for Michael to a high of 38% for Jeremy. Thus, the distribution of answers varied among the individual children.

In terms of developmental trends, there was an increase in the relative frequency of answering over time for all of the children except Michael and Adam. Their highest proportion of answers appeared in their second observations. Both boys, however, showed an increase in the frequency of answering from Time I to Time III.

Table 7 lists the absolute and proportional frequency of functions in the personal-social and object oriented categories when answers were separated out from the rest of the data. Comparison of these data with the proportion of personal-social and object oriented functions in Table 4 indicates that when answers were separated out, the functional orientation categories did not change. Although the same tendencies in functional orientation prevailed for all observations for the eight children both with and without answers, changes in the distribution of personal-social and object oriented functions exerted a statistical effect in the data from Jeremy's third

TABLE 6

THE ABSOLUTE AND PROPORTIONAL FREQUENCY OF UTTERANCES WHICH WERE ANSWERS AND THOSE WHICH WERE NOT FOR ALL CHILDREN FOR THE THREE OBSERVATIONS

	Nonlinguistic	Linguistic		
	Time I	Time I	Time II	Time III
Michael				
answers	10(.04)	5(.15)	20(.15)	14(.10)
not answers	222(.96)	28(.85)	117(.85)	130(.90)
Steven				
answers	16(.06)	4(.03)	16(.14)	37(.16)
not answers	239(.94)	112(.97)	99(.86)	201(.85)
Jeremy				
answers	33(.18)	0(0.0)	1(.08)	61(.38)
not answers	150(.82)	30(1.0)	11(.92)	101(.62)
Adam				
answers	13(.08)	4(.15)	7(.37)	18(.17)
not answers	148(.92)	23(.85)	12(.63)	86(.83)
Jamie				
answers	25(.17)	2(.09)	13(.13)	30(.14)
not answers	121(.83)	19(.91)	91(.88)	187(.86)
Nadine				
answers	8(.06)	8(.06)	12(.14)	62(.18)
not answers	137(.95)	123(.94)	72(.86)	287(.82)
Lauren				
answers	20(.13)	2(.04)	2(.06)	26(.25)
not answers	132(.87)	45(.96)	31(.94)	77(.75)
Rachel				
answers	24(.09)	3(.05)	16(.14)	19(.14)
not answers	235(.91)	53(.95)	100(.86)	113(.86)

TABLE 7

THE ABSOLUTE AND PROPORTIONAL FREQUENCY OF USE OF PERSONAL-SOCIAL AND OBJECT ORIENTED FUNCTIONS EXCLUDING ANSWERS FOR ALL SUBJECTS FOR THE THREE OBSERVATIONS

	Nonlinguistic	Linguistic		
	Time I	Time I	Time II	Time III
Michael				
personal-social	147(.63)	4(.12)	70(.51)	69(.48)
object oriented	34(.15)	17(.52)	31(.23)	49(.34)
Steven				
personal-social	104(.41)	22(.19)	31(.27)	51(.21)
object oriented	72(.28)	83(.72)	68(.59)	142(.60)
Jeremy				
personal-social	83(.45)	28(.93)	11(.92)	55(.34)
object oriented	41(.22)	2(.07)	0(.00)	42(.26)
Adam				
personal-social	86(.53)	9(.33)	8(.42)	55(.53)
object oriented	38(.24)	14(.52)	4(.22)	30(.29)
Jamie				
personal-social	67(.46)	10(.48)	58(.56)	116(.54)
object oriented	20(.14)	6(.29)	23(.22)	54(.25)
Nadine				
personal-social	69(.48)	63(.48)	28(.32)	146(.42)
object oriented	45(.31)	52(.40)	47(.53)	122(.35)
Lauren				
personal-social	58(.38)	18(.38)	17(.52)	42(.41)
object oriented	27(.18)	27(.57)	7(.21)	31(.30)
Rachel				
personal-social	98(.38)	21(.38)	48(.41)	59(.45)
object oriented	83(.32)	28(.50)	32(.28)	38(.29)

session and Nadine's last two. In Jeremy III, the removal of answers changed the difference from a significant to a nonsignificant one. For Nadine, the removal of answers from her Time II data yielded a significant difference where one had not been obtained. The removal of answers had the opposite effect in her third session yielding a nonsignificant difference where one had been reached. In conclusion, the separation out of answers to questions, a possible source of conflation of the findings, did not change which of the two functional orientations accounted for the majority of utterances any of the children used, but exerted a statistical effect in the results for three observations.

Linguistically and Nonlinguistically Realized Functions

Nonlinguistic utterances served significantly more personal-social functions for all the children at the beginning of the single word period (see Figure 3). However, differences existed among the children regarding the type of functions for which the majority of their linguistic utterances were used in this same period. Two of the children used significantly more object oriented functions and one used significantly more personal-social functions. Three of the nonsignificant differences tended toward object orientation and two toward the personal-social. There was a reversal in the direction of the greater of the two distributions which was statistically significant, the criteria for discontinuity, for five of the children. For two of the remaining children, there were more personal-social than object oriented functions realized linguistically as well as nonlinguistically. Although statistical significance was reached, this difference was not a practical one

Fig. 3. The absolute and proportional frequency of Time I personal-social and object oriented functions realized through nonlinguistic and linguistic forms and the significance of the difference between them based on chi square. (df = 1)

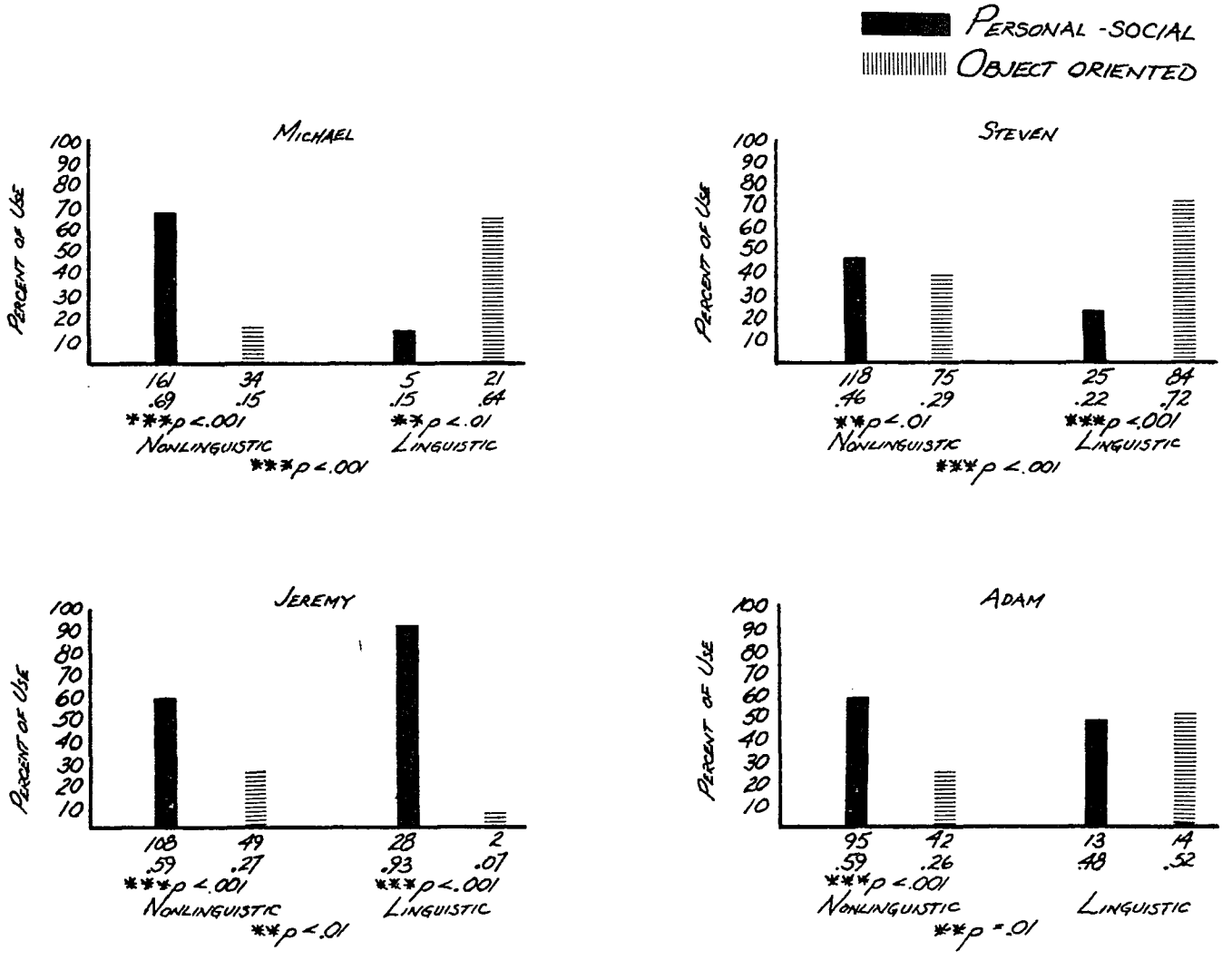
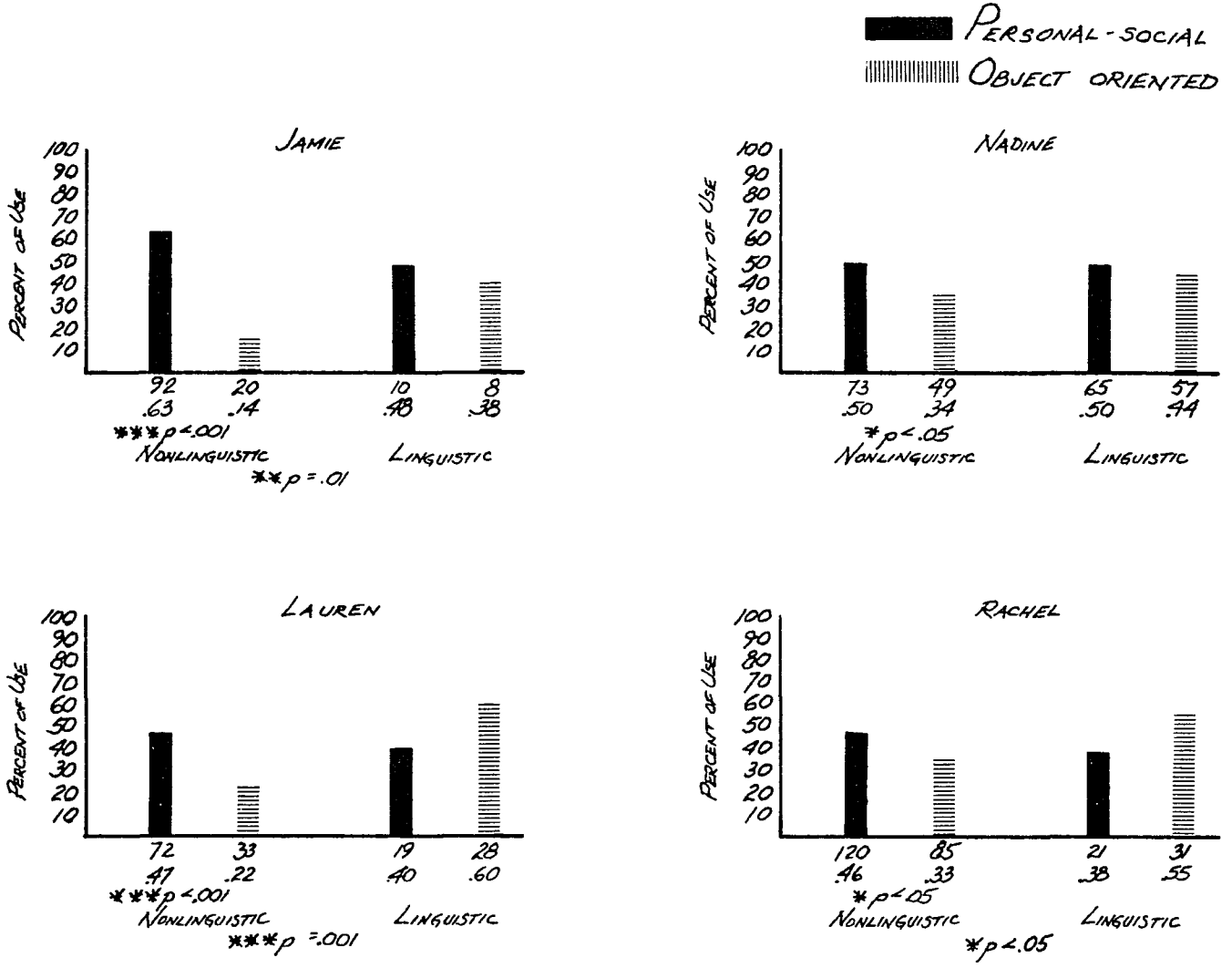


Fig. 3 - Continued



because personal-social functions accounted for the majority of uses for both their nonlinguistic and linguistic utterances. The remaining child also used more personal-social than object oriented functions in both her nonlinguistic and linguistic utterances, one of the criteria for continuity. The difference, which was not significant, fulfilled the other criterion for continuity. In terms of the fifth research question, these findings suggest that while nonlinguistic utterances are primarily personal-social, the relationship between the distribution of nonlinguistically and linguistically realized functions can be either continuous or discontinuous and varies with the child's pattern of linguistically realized utterances.

General Nominal Use and Lexical Style

The sixth research question concerns consistency between lexical style (that is, referential and expressive, Nelson, 1973) based on the number of general nominals in the children's cumulative vocabulary records and the frequency of use of general nominals when they had at least 50 different words. The cumulative vocabulary records of the eight subjects appear in Appendix B. The absolute and relative frequency of use of all the categories of form for the Time III observation are shown in Table 8. The table also lists each subject's designation as referential or expressive according to the modifications of Nelson's (1973) procedures described earlier.

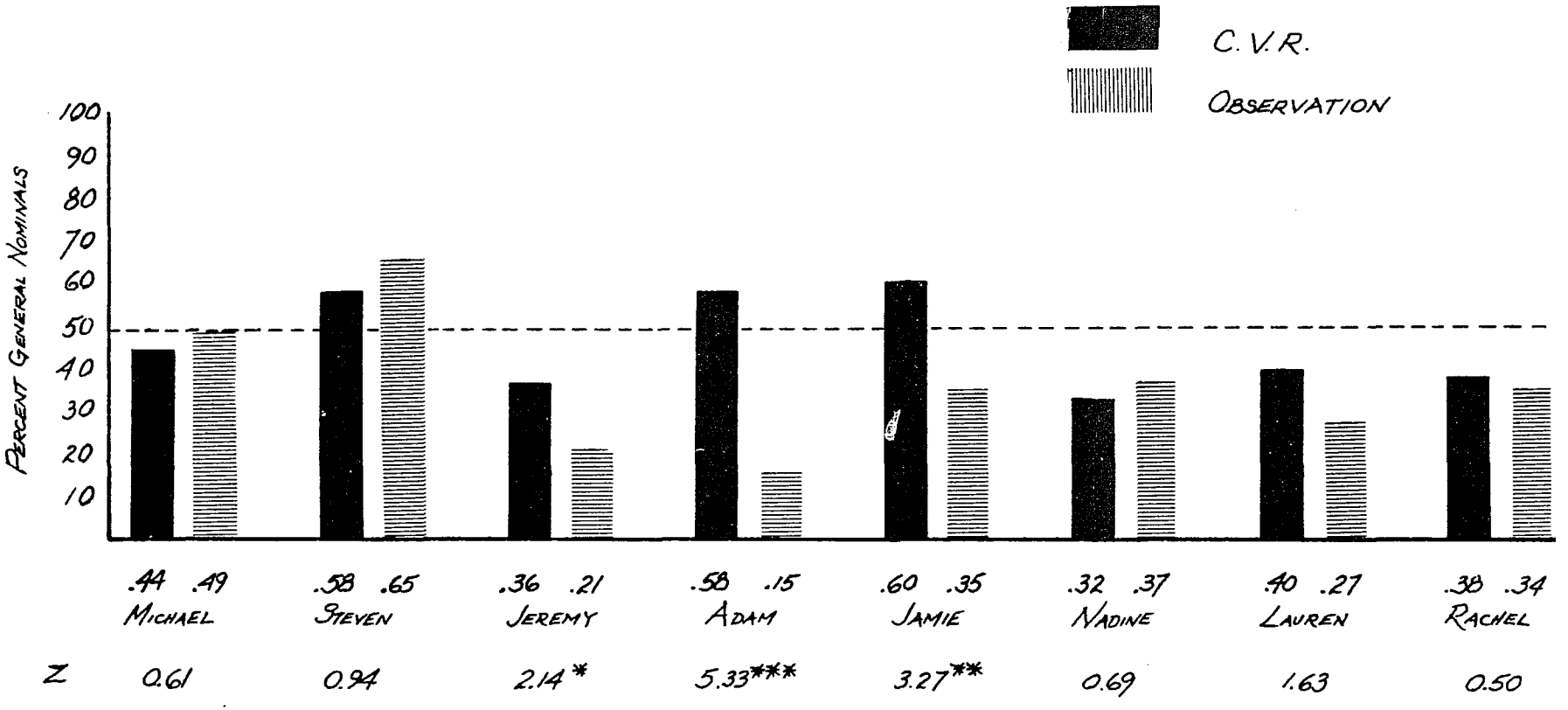
The percent of general nominal types in the cumulative vocabulary records was consistent with the proportion of general nominal tokens in the third videotaped sessions for five children according to the criteria specified in the Procedures (see Figure 4). The percent

TABLE 8

THE ABSOLUTE AND PROPORTIONAL FREQUENCY OF USE OF FORMS IN THE TIME III OBSERVATIONAL SESSION FOR EACH SUBJECT WITH REFERENTIAL/EXPRESSIVE DESIGNATION BASED ON THE CUMULATIVE VOCABULARY RECORD (C.V.R.)

	Referential Based on C.V.R.			Expressive Based on C.V.R.				
Form	Steven	Adam	Jamie	Michael	Jeremy	Nadine	Lauren	Rachel
specific nominal	2(.01)	16(.15)	13(.06)	17(.12)	2(.01)	14(.04)	3(.03)	15(.11)
general nominal	136(.57)	17(.16)	70(.32)	71(.49)	35(.22)	139(.40)	29(.28)	37(.28)
pronominal	13(.06)	20(.19)	8(.04)	7(.05)	3(.02)	41(.12)	11(.11)	4(.03)
action	12(.05)	15(.14)	28(.13)	20(.14)	22(.14)	9(.03)	9(.09)	12(.09)
modifer	19(.08)	17(.16)	16(.08)	17(.12)	17(.11)	95(.27)	4(.04)	9(.07)
personal-social	32(.13)	17(.16)	53(.24)	9(.06)	79(.49)	14(.04)	32(.31)	27(.21)
formula			7(.03)	1(.01)			2(.02)	7(.10)
formula fragment		2(.02)	5(.02)	1(.01)	2(.01)		12(.12)	8(.06)
multi-word nominal	22(.09)		5(.02)			1(.01)	1(.01)	8(.06)
multi-other	2(.01)		12(.06)	1(.01)	2(.01)	32(.09)		5(.04
Total number of utterances	238	104	217	144	162	349	103	132

Fig. 4. The proportion of general nominal types in the cumulative vocabulary records (C.V.R.) and tokens in the Time III observations with contrasts for each subject.



Note: Contrasts were performed using the Z test for the significance of the difference between two proportions.
*p < .05, **p<.01, ***p<.001, two-tailed

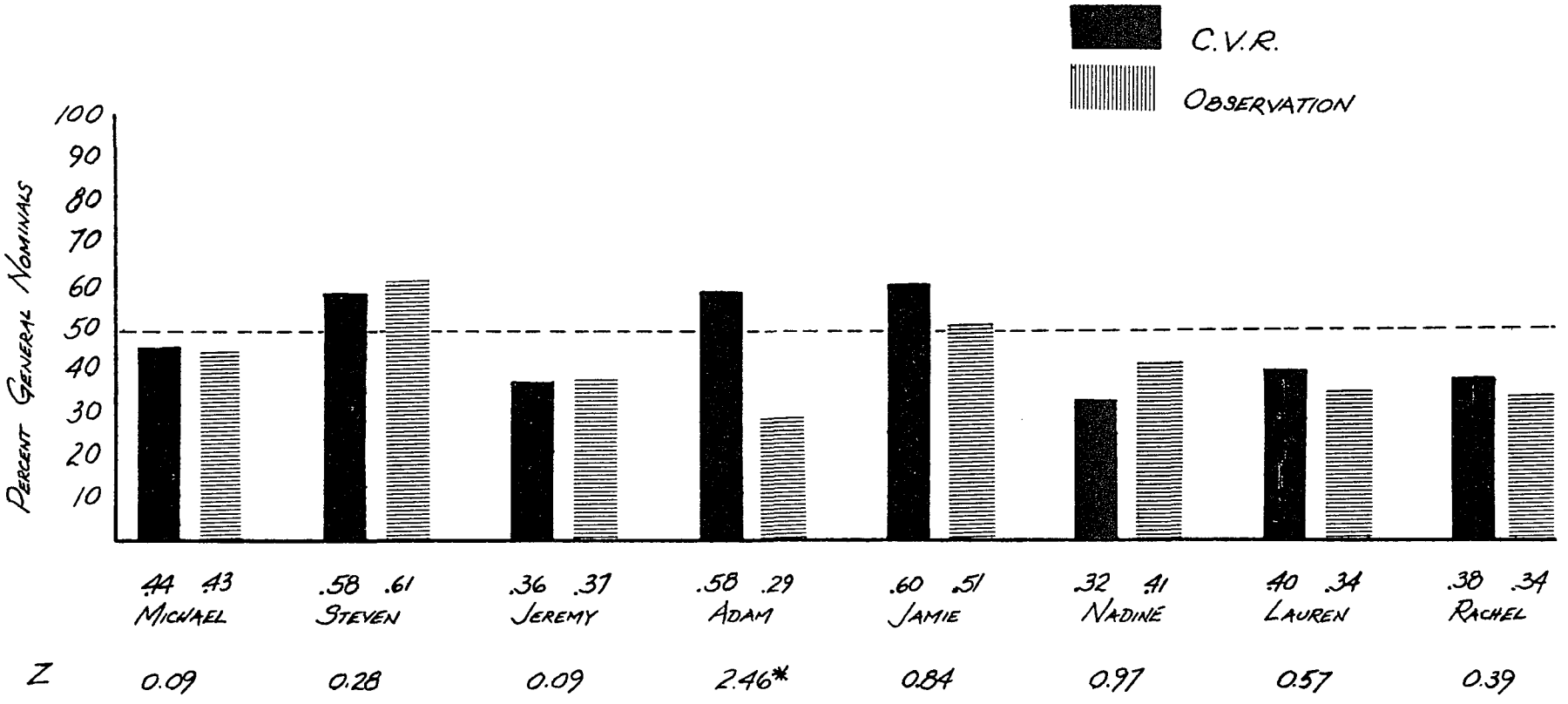
of general nominals in the cumulative vocabulary records and observational data were both greater or less than 50% for six children, but the difference between the two proportions was significant for only one. The two remaining children had significant differences with more than 50% general nominals in their cumulative vocabulary records but less than 50% use of general nominals in their third sessions. A commonality among the three children who had significant differences was a tendency toward a larger percent of general nominals in their cumulative vocabulary records than was observed in the videotaped observations.

The referential-expressive lexical style designations based on the proportion of general nominal types in the cumulative vocabulary records and third observations were the same for seven of the children (see Figure 5). The only difference occurred in Adam's designation. This difference was significant ($p < .05$). He was referential based on the proportion of general nominal types in his cumulative vocabulary record, but expressive based on the proportion of general nominal types in his videotaped session.

Form and Function in the Single-word Utterance Period

General nominals were used for more object oriented than personal-social functions (see Table 9). This pattern emerged for all three time periods. The only exception to this finding occurred in Jeremy's first two sessions. However, Jeremy's use of general nominals for more object oriented functions in Time III is similar to the pattern the other children displayed for all three time periods. Adam did not use general nominals at all during his second session. However, his

Fig. 5. The proportion of general nominal types in the cumulative vocabulary records (C.V.R.) and Time III observations with contrasts for each subject.



Note: Contrasts were performed using the Z test for the significance of the difference between two proportions.

*$p < .05$, two-tailed

TABLE 9

THE ABSOLUTE AND PROPORTIONAL FREQUENCY OF GENERAL NOMINALS USED FOR PERSONAL-SOCIAL, OBJECT ORIENTED, AND OTHER FUNCTIONS FOR EACH SUBJECT FOR THE THREE OBSERVATIONS

	Time I			Time II			Time III		
Subject	Personal-Social	Object Oriented	Other	Personal-Social	Object Oriented	Other	Personal-Social	Object Oriented	Other
Michael	3(.17)	15(.83)		7(.15)	29(.62)	11(.23)	20(.28)	45(.63)	6(.09)
Steven	5(.16)	25(.81)	1(.03)		43(1.0)		21(.15)	109(.80)	6(.04)
Jeremy	2(1.0)			1(1.0)			1(.03)	34(.97)	
Adam	2(.29)	5(.71)					1(.06)	16(.94)	
Jamie		3(1.0)		7(.23)	14(.47)	9(.30)	18(.26)	49(.70)	3(.04)
Nadine		14(.93)	1(.07)		22(1.0)		17(.12)	115(.83)	7(.05)
Lauren	1(.13)	7(.88)		1(.13)	2(.25)	5(.63)	5(.17)	23(.79)	1(.03)
Rachel	1(.07)	11(.79)	2(.14)	7(.19)	26(.70)	4(.11)	3(.08)	30(.81)	4(.11)

pattern for the other two observations is consistent with the patterns that emerged from the data for the other children.

The results of the crosstabulation of form by function for individual children appear in Table 10 in descending order of frequency of occurrence. The interactions reported on the table occurred at least five times in a sample or accounted for at least 10% of the data for the observation. There were other less frequently occurring form/function combinations which accounted for between 5% and 9% of the utterances in individual children's samples. These are listed in Appendix C. The results reported below are organized by the categories of form and the different functions for which they were used by the children in this study.

General Nominals

Of all the different form/function combinations reported in Table 10, the most common was the use of general nominals for labels. This interaction occurred in 19 of the 24 samples. Four of the children, Michael, Steven, Nadine, and Rachel, demonstrated this combination in all three observations. Three of the children, Adam, Jamie, and Lauren, demonstrated this interaction in two of their sessions. Jeremy displayed this combination in his last session only. The use of general nominals to label was a commonality that linked all of the children in that it was the only frequently occurring form/function combination used by all the children at least once.

Whereas labelling can only be realized through general nominals, general nominals can serve several different functions. In the present investigation, Rachel used them for the imaginative function. Steven used general nominals for the instrumental and heuristic functions.

TABLE 10

THE ABSOLUTE AND PROPORTIONAL FREQUENCY OF THE THREE MOST FREQUENTLY USED FORM/FUNCTION COMBINATIONS FOR INDIVIDUAL SUBJECTS FOR THE THREE TIME PERIODS

	Time I		Time II		Time III	
Subject	Form/Function	n(%)	Form/Function	n(%)	Form/Function	n(%)
Michael	gen.nom./label	10(.30)	gen.nom./label	27(.20)	gen.nom./label	39(.27)
			action/regulatory	16(.12)	gen.nom./instrumental	20(.14)
			form.frag./interactional	10(.07)	spec.nom./instrumental	10(.07)
Steven	pronominal/indicative	45(.39)	gen.nom./label	37(.32)	gen.nom./label	84(.35)
	gen.nom./heuristic	12(.10)	pronominal/indicative	23(.20)	gen.nom./instrumental	20(.08)
	gen.nom./label	11(.10)	pronominal/show/give/take	9(.08)	per.social/protest/rej.	13(.06)
			pronominal/heuristic	9(.08)		
Jeremy	spec.nom./interactional	7(.23)	action/doing	9(.75)	per.social/protest/rej.	52(.32)
	spec.nom./show/give/take	4(.13)			action/doing	30(.19)

TABLE 10-Continued

Subject	Time I		Time II		Time III	
	Form/Function	n(%)	Form/Function	n(%)	Form/Function	n(%)
	spec.nom./instrumental	3(.10)			modifier/comment	16(.10)
	spec.nom./protest/rej.	3(.10)			gen.nom./label	16(.10)
Adam	gen.nom./label	5(.19)	action/regulatory	5(.26)	gen.nom./label	14(.14)
	action/regulatory	4(.15)	pronominal/indicative	3(.16)	per.social/protest/rej.	12(.12)
	pronominal/indicative	3(.11)	spec.nom./label	3(.16)	pronominal/instrumental	11(.11)
	form.frag./heuristic	3(.11)	pronominal/instrumental	3(.16)		
Jamie	per.social/greeting	6(.29)	gen.nom./label	13(.13)	gen.nom./label	43(.20)
	pronominal/indicative	3(.13)	per.social/greeting	11(.11)	per.social/greeting	37(.17)
			spec.nom./call	7(.07)	action/doing	15(.07)
			gen.nom./instrumental	7(.07)		
			per.social/routine	7(.07)		

TABLE 10-Continued

Subject	Time I Form/Function	Time I n(%)	Time II Form/Function	Time II n(%)	Time III Form/Function	Time III n(%)
Nadine	per.social/personal	21(.16)	gen.nom./label	21(.24)	gen.nom./label	91(.26)
	per.social/greeting	19(.15)	per.social/greeting	9(.10)	per.social/affirm./denial	28(.08)
	gen.nom./label	13(.10)	per.social/protest/rej.	7(.08)	per.social/protest/rej.	24(.07)
Lauren	form.frag./heuristic	12(.26)	per.social/routine	4(.12)	gen.nom./label	22(.21)
	action/doing	10(.21)			per.social/protest/rej.	12(.12)
	gen.nom./label	5(.11)			form.frag./routine	7(.07)
Rachel	per.social/comment	10(.18)	gen.nom./label	17(.15)	gen.nom./label	27(.21)
	form.frag./routine	10(.18)	form.frag./routine	11(.10)	per.social/greeting	10(.08)
	gen.nom./label	9(.16)	gen.nom./imaginative	5(.04)	per.social/protest/rej.	8(.06)
	action/comment	6(.11)				

Jamie also used them instrumentally in her second session.

Specific Nominals

Specific nominals were used for several different functions. They were especially prevalent in Jeremy's first session in which they served several personal-social functions including the regulatory, interactional, show/give/take, and protest/rejection. Both Jeremy and Michael used specific nominals instrumentally as well. In his second session, Adam named himself while looking at his reflection in the mirror after his bath.

One sex-related difference that emerged from the data was that the males used specific nominals for a greater number of different functions than did the females. This depended on the males' using "mommy" for a greater number of functions than the females. Jamie, for example, restricted her use of "mommy" to only one function, calls. In her second session, she said "mommy" to call her mother from the living room while the latter was in the kitchen preparing lunch. The only other sex-related difference in the use of forms occurred with personal-social words (see p.112).

Pronominals

The most common use of pronominals in the present study was to indicate objects, for example, "that" said while pointing to a shoe. This was an early appearing interaction observed in the Time I sessions of Steven, Adam, and Jamie. Steven and Adam displayed this combination at Time II as well. Adam also used pronominals for the instrumental function, for example, "that" said while pointing to desired objects out of his reach on a shelf. Steven used pronominals

heuristically, for example, "this" said while pointing to a cookie cutter. The use of pronominals at the 50 word level was not related to the referential-expressive distinction as Nelson (1975) found later.

Action

The use of action words for the regulatory function occurred in Michael II and in Adam I and II. The use of action words for doing utterances appeared in Lauren I, Jamie III, and Jeremy II and III. Rachel used action words for comments in her first session, for example, she said "down" to describe the location of a toy on the floor.

Modifiers

Jeremy III was the only session in which the use of modifiers for comments was a relatively frequent interaction. For example, he said "blue" to describe a blue strip on a boat and also overgeneralized the term in reference to a red block. Other children used modifiers to comment, but at lower frequencies. The modifier "more" was also used by several of the children for the instrumental and regulatory functions.

Personal-social

The second most frequent form/function combination in the data was the use of personal-social words such as "no" to protest/reject. This was generally a later appearing interaction observed in the last session only for Steven, Jeremy, Adam, Lauren, and Rachel. Nadine displayed this interaction for her last two sessions. Jamie also used this combination in Time II, but it was not among her three most frequent (see Appendix C). The use of personal-social words to protest/reject was a regularity that linked most of the children.

Further, the girls used personal-social words for a greater number of different functions than did the boys in this study. Personal-social words figured prominently throughout all of Nadine's observations. She used them to express the personal function at Time I, for example, she said "oh" to express delight upon first being presented with the box of novel toys used throughout the study. She also used them for affirmation/denials in Time III (for example, "yes" and "no"). She, Jamie, and Rachel also used the forms for greetings (for example, "hi" and "bye"). This combination occurred in all three sessions for Jamie, the first two for Nicole, and in only the third for Rachel. Jamie and Lauren also used personal-social words for routines in their second observations. Rachel I was the only session in which they served an object oriented function, commenting.

Formulas and Formula Fragments

Formulas were not used for particular functions at frequencies high enough to be reported, but formula fragments were. Michael used a formula fragment for the interactional function in his second session when he persisted in trying to get his mother to play "Ring-around-the-Rosie" with him by uttering "pocket" derived from the phrase "a pocket full of posies." Formula fragments also featured in Rachel's first two sessions and Lauren's third in which they were used in routines. Lauren and Adam used them to express the heuristic function in their first observations as well. For example, Lauren said "what that" while picking up and looking at the blocks that were in the box of novel toys provided by the investigator.

Multi-word Utterances

Although no multi-word forms combined with particular functions frequently enough to be reported in Table 10, a few occurred at lower frequencies (see Appendix C).

Individual Differences

The majority of combinations of form and function that occurred in the data are further evidence for individual differences. In Table 10 there were 28 different combinations of form and function, 16 of which were observed in single subjects. Jeremy was the most unique in this regard in that he displayed five interactions not used by any of the other children. His use of specific nominals to protest/reject is an example. Steven and Rachel each displayed three stereotypical combinations; Adam and Nadine two. Jamie had one unique combination. The evidence for individual variation is further substantiated by the less frequently observed interactions. Of the eleven combinations in Appendix C not appearing in Table 10, nine were used by single subjects. Commonalities in form/function combinations among the children were quite rare. The only two outstanding ones were general nominals used to label and personal-social words to protest/reject.

Individual Subject Profiles

Because patterns of preference in both form and function emerged in the individual subject's data, a summary of each child's profile will highlight these differences.

Michael

Reaching the 50 word level at 16½ months, Michael, a first born,

was the most precocious male in the study. Object oriented utterances dominated in Michael's first observation when labelling was his most frequently used function. Two of the personal-social functions, specifically the instrumental and regulatory, accounted for a large proportion of his utterances in the last two observations. Like most of the children in the study, labelling was a high frequency function for Michael at Time III. In Michael's data the dominance of object oriented functions over personal-social ones for Time I contrasts sharply with his patterns for Times II and III which were characterized by a majority of personal-social functions. Michael had 44% general nominals among his first fifty words which designated him expressive. His Time III observation had 49% general nominal tokens, a consistent proportion. In terms of function, the majority of his uses of language were personal-social in the same time period. Thus, the data for Michael indicate interrelationships between pragmatic development and lexical acquisition and use.

Steven

This first born male had a dominance of object oriented uses of language throughout the study. The specific functions Steven used most often were to indicate and label objects. This object oriented preference in function was reflected in his early lexical development as well with the acquisition of a referential vocabulary comprised of 58% general nominals. Steven used general nominal forms at almost exactly that same relative frequency (57%) in his last observation. The tendency toward more frequent general nominal use in his single word utterances was reflected in his developing word combinations as well. The consistent preference of object oriented functions in conjunction with a relatively high frequency of use and acquisition of general

nominals in this child are evidence that form and function interact from the beginning stage of language development.

Jeremy

In contrast, this second born male used his words predominantly for personal-social functions throughout the study. The distribution of his linguistically realized functions at the beginning of the single word period, with a greater proportion of personal-social than object oriented functions, was similar to the pattern in the nonlinguistic data of the other children. In contrast to the others, his use of language for object oriented functions was minimal until the last session with the emergence of labels and comments. Although rate of lexical development was not of primary interest in this investigation, it should be noted that his data collection period was the most protracted as he did not reach the fifty word criterion until two years. Jeremy had the lowest volubility at Time II and in several of the home visits during the middle of the data collection period was observed to use little or no language. His volubility, however, increased substantially by the last observation.

Adam

The investigator judged this second born male to be the least intelligible child in the study. Adam's mother concurred with this impression as she reported that she also found him difficult to understand. Further, his overall linguistic volubility was the lowest of the children.

Like most of the children in the study, the majority of his linguistic utterances at Time I were used for object oriented functions.

The majority of linguistic utterances at Times II and III had personal-social functions. A steady increase in personal-social functions and decrease in object oriented ones over time characterized his pragmatic development. His early nonlinguistic utterances were used most often for the personal function. In all of Adam's observations, the instrumental and regulatory functions were among his most frequently used suggesting that Adam saw language as a tool to satisfy his needs. By the third observation, Adam was using a greater variety of functions than he had demonstrated previously.

In terms of form, general nominals accounted for 40% of the utterances in his Time III observation. Adam used pronominals more than any other type of form and more often than did any of the other children in the study. Adam's cumulative vocabulary record consisted of 58% general nominals, whereas he used general nominals at significantly lower levels (15%) in the videotaped session. This discrepancy may be due in part to the ease in picking out the referents for general nominal forms in this unintelligible child's language. Despite this difference for the findings across data bases, the results for his observational session alone yield consistent form/function interactions. In the third observation he used few general nominal forms which is consistent with his personal-social preference in function.

Jamie

This first born female used a majority of personal-social functions for the three observations. Her most frequently used functions in the earlier two sessions were protest/rejection and greeting and labelling in the last.

General nominals accounted for 32% of Jamie's utterances in

her Time III observation, a finding consistent with her functional preference for personal-social over object oriented functions. Most of the general nominals she did use were to label objects. Jamie's cumulative vocabulary record contained a relatively larger proportion of general nominal types (60%) than general nominal tokens (35%) in her third observation. However, the type-type comparison of the proportion of general nominals in her cumulative vocabulary record and third observation both yielded a referential designation. Jamie, like Adam, had consistency in the degree of use of general nominal forms and object oriented functions in the Time III observation, but a discrepancy between the proportion of general nominal types in her cumulative vocabulary record and general nominal tokens observed in the third videotaped session.

Nadine

This first born female was the most precocious child in the study in terms of rate of vocabulary growth. She reached the criterion for the third observation at 15 months. She also had the highest linguistic volubility overall and in the first and last sessions in particular. The data for Nadine were nearly equally divided between the two functional orientation categories although she displayed a tendency toward more personal-social uses of language during the one word stage. Nadine's most frequently used linguistic functions were the personal at Time I and labelling at Times II and III.

Nadine's cumulative vocabulary record consisted of 32% general nominals designating her as having an expressive lexical style. Consistent with that style, her vocabulary was comprised of a relatively large proportion (28%) of personal-social words. In the Time III

observation, general nominals accounted for 37% of her utterance tokens, a proportion consistent with the vocabulary record. The functional orientation of her utterances, in conjunction with the forms used to express the functions, are further evidence of an interaction between the two domains of language when children are beginning to talk.

Lauren

Object oriented functions dominated in this second born female's first and personal-social in her last two observations. Lauren's most frequently expressed linguistic functions for each session were the heuristic at Time I, repeating and routines at Time II, and labelling at Time III. Lauren's pragmatic development was characterized by shifts in functional preference with an increase followed by a decrease in personal-social functions and a decrease then an increase in object oriented ones.

The makeup of her early vocabulary, with 40% general nominals, resulted in an expressive designation. Her vocabulary was also comprised of several formulaic expressions (e.g., "what this," "who that") which accounted for 14% of the forms she used in the last session. She used general nominals in that observation 28% of the time resulting in a consistency between the vocabulary record and Time III observational data with respect to form. Further, the results of the functional analysis of her data suggest that there is an interaction between form and function in the period of early vocabulary growth.

Rachel

This second born female was the slowest ($17\frac{1}{2}$ months) to reach

the criterion for the first videotaped session. However, once that level was reached, her lexical development rapidly increased. She had the shortest duration (3 weeks) between her last two observations indicating her accelerated rate of vocabulary growth toward the end of the investigation.

For Rachel, object oriented functions dominated only in Time I when comments accounted for the largest number of her utterances. She had a steady increase in the relative frequency of use of personal-social functions over time. Among these, she used routines most often. Like many of the other children in the study, Rachel labelled more in Time III than in the earlier two sessions.

Because Rachel had 38% general nominals in her cumulative vocabulary record, she was designated expressive. Her Time III observational data, yielding 34% general nominal tokens, was consistent with the vocabulary record. The data for Rachel also support the notion that form and function are interrelated in the period of early vocabulary growth. This interaction seems strongly substantiated by the data as a whole.

Unifunctional and Multifunctional Interactions

Only one child used individual lexical items for a single function. The other seven children used individual lexical items both unifunctionally and multifunctionally. Six of these seven had more multifunctional than unifunctional lexical items; the other child had an equal number of unifunctional and multifunctional forms (see Table 11). These results indicate that words are not necessarily tied to one function at the beginning of the single word utterance period. Some

TABLE 11

THE NUMBER OF DIFFERENT WORDS PRODUCED AT LEAST TWO TIMES IN THE TIME I SAMPLE USED FOR ONLY ONE AND MORE THAN ONE FUNCTION BY EACH CHILD

Subject	Number of Different Words Used for Only One Function	Number of Different Words Used for More Than One Function
Michael	4	5
Steven	5	6
Jeremy	0	2
Adam	2	4
Jamie	4	0
Nadine	8	11
Lauren	3	3
Rachel	4	7
Total	30	38

words may be used for one function (for example, "hi" for greetings by Steven and Jamie; "no" to protest/reject by Nadine), but others serve more than one function for individual children (for example, "cup" for the instrumental, regulatory, and comments by Steven; "down" for the regulatory, determination, doing, routines, and comments by Rachel). Further, words which are unifunctional for one child may be multifunctional for another (for example, Jamie used "whee" only for comments, but Nadine used "whee" for the personal and interactional functions as well as for comments). These results suggest that both unifunctional and multifunctional uses of words co-exist at the beginning of the one word period.

Cognitive Development

The sensorimotor level that each child achieved on the means-end portion of the Ordinal Scales of Psychological Development (Uzgiris & Hunt, 1975) appears on Table 12. Each child's chronological age and functional orientation are also listed for the three time periods. At Time I all the children achieved stage 5 on the means-end scale, whether or not they used more object oriented or personal-social functions. At Time II, one personal-social and one object oriented child achieved stage 6 and the others, five object oriented and one personal-social remained at stage 5. At Time III, all but one child, who used mostly personal-social functions, reached stage 6.

In terms of lexical style based on the cumulative vocabulary records, all of the referential children reached stage 6 by Time III and all but one of the expressive children did. Level of means-end abilities did not differentiate the children in the present investigation in terms of types of forms acquired nor types of functions expressed. The most

TABLE 12

THE MEANS-END COGNITIVE LEVELS, CHRONOLOGICAL AGES, TYPES OF FUNCTIONS EXPRESSED MOST FREQUENTLY BY THE EIGHT SUBJECTS FOR THE THREE OBSERVATIONS AND THEIR REFERENTIAL/EXPRESSIVE DESIGNATIONS BASED ON THE CUMULATIVE VOCABULARY RECORDS

		Time I			Time II			Time III		
Subject	Referential/ Expressive	Age	Cognitive Level	Functions	Age	Cognitive Level	Functions	Age	Cognitive Level	Functions
Michael	expressive	1;1;18	5	object oriented	1;3;15	5	personal-social	1;4;26	6	personal-social
Jeremy	expressive	1;3;0	5	personal-social	1;5;10	5	personal-social	2;0;13	6	personal-social
Lauren	expressive	1;1;2	5	object oriented	1;2;26	5	personal-social	1;6;7	6	personal-social
Rachel	expressive	1;5;16	5	object oriented	1;7;2	5	personal-social	1;7;27	6	personal-social
Nadine	expressive	1;0;14	5	personal-social	1;1;24	5	object oriented	1;3;15	6	personal-social
Adam	referential	1;1;1	5	object oriented	1;4;0	5	personal-social	1;5;20	5	personal-social
Jamie	referential	1;2;13	5	personal-social	1;4;13	6	personal-social	1;6;11	6	personal-social
Steven	referential	1;3;10	5	object oriented	1;5;25	6	object oriented	1;7;20	6	object oriented

consistent finding was that means-end abilities improved with age for all but one child who remained at stage 5 throughout the entire study. These results suggest that level of means-end cognitive abilities, as measured by the Uzgiris-Hunt scale (1975), does not influence lexical style or functional orientation.

Maternal Speech Style

A post hoc analysis of the speech of the mothers of the two children who displayed consistent, dominant functional orientations for the three observations was performed (see Table 13). The mother of the object oriented child used more general nominals, object references, and object oriented functions than the mother of the personal-social oriented child. The differences between these mothers on the three measures were significant. Further, each mother's language appeared consistent with her child's in that the mother of the object oriented, referential child had more than 50% frequency of occurrence on the three object related linguistic measures whereas the mother of the personal-social, expressive child had less than 50% frequency of occurrence on the same measures. The results of this preliminary analysis indicate that children who demonstrate a consistent functional orientation throughout the single word utterance period have mothers whose linguistic style match that of their children.

To rule out the possibility that the greater frequency of use of general nominal forms in the referential child could be attributed to his mother's tendency to elicit labels, the number of attempts the mothers made to elicit labels and the number of labels each child produced in response to the mother's elicitation was calculated for the same time sampled segments used for the analysis of the mother's

TABLE 13

THE ABSOLUTE AND PROPORTIONAL FREQUENCY OF THREE MEASURES OF OBJECT-RELATED LANGUAGE IN A TEN MINUTE TIME SAMPLED SEGMENT OF THE SPEECH OF THE TWO MOTHERS WHOSE CHILDREN DEMONSTRATED A CONSISTENT, DOMINANT FUNCTIONAL ORIENTATION IN THE THREE OBSERVATIONS. THE MOTHERS' SPEECH SAMPLES WERE DERIVED FROM TWO CONTEXTS, BATHING THEIR CHILDREN AND PLAYING WITH THE TOYS PROVIDED BY THE INVESTIGATOR, IN TIME I

	Utterances with a General Nominal		Utterance Refers to an Object		Utterance with an Object Oriented Function		Number of Utterances in the Sample	
Context	Steven's Mother	Jeremy's Mother	Steven's Mother	Jeremy's Mother	Steven's Mother	Jeremy's Mother	Steven's Mother	Jeremy's Mother
Bath	8(.21)	12(.22)	7(.18)	12(.22)	7(.18)	15(.28)	39	54
Toys	68(.62)	15(.38)	82(.75)	24(.62)	82(.74)	18(.46)	109	39
Total	76(.51)	27(.29)	89(.60)	36(.39)	88(.59)	33(.35)	148	93
Z	3.363***		3.134**		3.582***			

Note: Contrasts were performed using the Z test for the significance of the difference between two proportions.
**$p < .01$, ***$p < .001$, two-tailed

speech. Steven's mother made five attempts to elicit labels and Jeremy's mother three (for example, "what is that") and in no instance for either child did the mother's attempt to elicit a label result in the production of a label on the part of the child. This result indicates that Steven's greater use of general nominals cannot be attributed to responses to his mother's attempt to elicit labels at least in the segment analyzed.

Summary

The results of this study are summarized as follows:

1) More personal-social than object oriented functions were expressed nonlinguistically by all the children.

2) Differences existed among the children in the predominant functions expressed linguistically at the beginning, middle, and end of the single word utterance period with two emergent developmental patterns.

a) Two of the children had a consistent style with the same type of functions dominating throughout the entire period. Another child tended toward a particular style although she did not meet the criteria established for this study for having a consistent style.

The post hoc analysis of the speech of the two mothers whose children had a consistent style throughout yielded significant differences in the expected direction on the number of general nominals, object references, and object oriented utterances. These data suggest a possible interaction between the mothers' and children's speech styles.

b) The five other children had different types of functions dominate at different points in time with a trend in their data for growth in personal-social functions and a proportional dimunition of

object oriented ones from the beginning to the end of the single word period.

To more fully explore the trend toward increased use of personal-social functions over time for the five children displaying this pattern, personal oriented functions were separated from social oriented ones for the three observations. The frequency of use of the personal oriented functions did not follow any discernible pattern. However, there was a consistent increase in the use of the social oriented functions over time for the five children suggesting a developmental trend in more social uses of language.

3) Both referential and expressive lexical styles emerged from the cumulative vocabulary records. The percent of general nominal types in these records and the Time III observations were consistent for seven of the children. The one inconsistency which occurred was a referential designation based on the cumulative vocabulary record and an expressive designation based on the observational data.

The proportion of general nominal types in the cumulative vocabulary records and general nominal tokens in the observations were consistent for five of the children. Where there was inconsistency between the data bases, there was a tendency toward a larger percentage of general nominals in the cumulative vocabulary records than in the observations. These data also indicate a tendency for general nominals to account for less than 50% of the child's utterances at the 50 word level.

4) There was more variability than similarity in the children's most frequently used form/function combinations. In terms of commonalities among the children, all used general nominals to label and most

used personal-social words to protest/reject. The boys used specific nominals for more varied functions than the girls and the girls used personal-social words for more varied functions than the boys.

5) The children in this study used words both unifunctionally and multifunctionally in Time I suggesting that words are not necessarily tied to one function even at the beginning of the single word utterance period.

6) Level of means-end cognitive abilities did not differentiate children who acquired referential vocabularies from those who acquired expressive vocabularies. Nor did level of means-end cognitive abilities distinguish children who used mostly personal-social functions from those who used mostly object oriented ones.

CHAPTER V

DISCUSSION

The results indicated that more personal-social than object oriented functions were expressed nonlinguistically at Time I, a pattern which was consistent for the eight children. This regularity in the data may be attributed to the fact that more of the personal-social than object oriented functions could be expressed nonlinguistically. Specifically eight of the thirteen categories of personal-social functions (i.e., nearly two-thirds of them), could be realized without the use of words. For example, the interactional function could be expressed nonlinguistically but calls could not. In contrast, only three of the six object oriented functions (i.e., only half of them) could be expressed nonlinguistically. For example, the indicative function could be expressed nonlinguistically, but labels could not. Since more of the personal-social than object oriented functions could be realized nonlinguistically, it was not surprising that at Time I, when the children only had about ten words, personal-social functions occurred more frequently than object oriented ones for all eight children.

This finding is consistent with Halliday's (1975) description of Nigel's use of protolanguage for the instrumental, regulatory, personal, and interactional functions (all considered personal-social in this study) prior to the more object oriented heuristic and

imaginative functions. Although Halliday's anecdotal data does not include frequency of use of the different functions, there is a connection between his order of emergence data and the frequency of use data of this investigation. The eight children who participated in this study used most of their early nonlinguistic utterances for the same functions which emerged first for Nigel.

Similarly, in McShane's data (1980) functional categories which could be considered as having a personal-social orientation were also realized nonlinguistically. He reports that requests, analogous to the instrumental and regulatory categories used in this and Halliday's (1975) investigations, were expressed more often without words than through words earlier in the single word period. McShane also reported that at the beginning of the single word period nonlexicalized utterances were used more frequently than lexicalized utterances to protest. Protesting was another function considered personal-social in this study. The vast majority of the children's utterances were nonlinguistic in the data obtained from the earlier observational sessions of McShane's (1980) longitudinal study. This was also the finding in the Time I data of the present investigation.

Whereas there was a single trend for all children in the nonlinguistic data, there were both individual differences and patterns of regularity in different children's use of words. In the linguistic data, the majority of children shifted their functional preferences over time. The children who demonstrated such a change used more object oriented functions at Time I and shifted to more personal-social uses of words at Time II or III.

In the first observation, the object oriented function that

occurred most frequently overall was the indicative function. Rees (personal communication) views indicating objects as an early example of the symbolic function (Werner & Kaplan, 1963), the capacity for reference. Along similar lines, Greenfield & Smith (1976) claim that the use of words to indicate objects is the earliest manifestation of language proper. They report that, for the two children they studied, using words to indicate objects occurred earlier than to demand desired objects. This sequence seems consistent with an earlier object oriented use of words. Frequent occurrence of the indicative function seems likely at the beginning of the single word period in that children can represent a variety of referents at a time when their lexicons are limited to just a few words. The children who used this function did so mostly through the pronominals "this" and "that" to indicate many different objects. Two of the children used the personal-social word "oh" in addition to the pronouns "this" and "that" for the indicative function.

Labelling was the second most frequently occurring object oriented function overall at Time I. Similarly, Halliday (1975) reported that Nigel's first words, as distinguished from his protolinguistic expressions, were used in the context of observation and recall as a means of representing his world. Halliday's account of Nigel's earliest uses of a lexicon seems consistent with the object oriented uses of language in the present investigation. This early object oriented preference in functions also echoes the notion of "early referentiality" that Snyder, Bates, & Bretherton (1981) described for some of their 13 month old subjects who had a high proportion of object names in their lexicon. In the present investigation, all of the children who

displayed a majority of object oriented functions at Time I used the few general nominals they had more often to label objects than to request objects. Thus, they too displayed an early referentiality.

To label an object, the child has to apply a name. On the other hand, to request an object with a name, the child has to apply a name as well as interact with another person. It may be more difficult for the child just beginning to talk to use words for functions which require social interaction with others than those which do not. Thus, early words were used more frequently for the object oriented functions. None of the functions considered object oriented in the study required the child to interact at the same time.

It may be more difficult for the child to coordinate the activities of talking and interacting, than to perform one activity, talking or interacting. This notion of complexity in coordinating two events, as compared with engaging in a single activity, has been used to explain a sequence of nonlinguistic communicative development (Sugarman, 1973). Sugarman (1973) found that prior to one year, the infant interacts with persons or objects, but not both simultaneously. Then, at about one year of age, the infant coordinates interactions with both persons and objects on a nonlinguistic level. This sequence of separate interactions followed by coordinated interactions on the nonlinguistic level is similar to the results of the present study. At the beginning of the single-word period, most of the children in this study used the majority of their words for functions that did not involve interaction. Nonlinguistic utterances were used in interaction. Then, later in the single word period, the children used words and simultaneously interacted with others.

By the second or third observation, the five children who used words for mostly object oriented functions at Time I used words for mostly personal-social functions. In the post hoc analysis in which personal functions were separated from the social oriented ones, four of the five children displaying this pattern had a steady increase in the social uses of language over time. In contrast, there were no consistent developmental trends for the use of personal oriented functions. In addition, the one child who was significantly object oriented in the use of language throughout the study also showed this same trend of increased social functions over time. The data from the remaining two children did not display steady increases in social functions over the three time periods, but some increase in social functions was noted. The child who was significantly personal-social throughout used increased social functions from Time II to III. The other child, who was significantly personal-social in the last two sessions and had a non-significant majority of personal-social functions in the first session, showed increased social functions from Time I to III. Thus, this trend of increased social uses of language over time characterized most of the data on the development of functions.

One child, Jeremy, used more social functions at the beginning of the study than at the end. Earlier it was suggested that it is easier to use words for functions which do not require interaction with others than for those functions which do. However, this factor alone (the use of a word for functions which involve social interaction) does not account for the data from Jeremy's first session in which the majority of his words were used for social functions. Jeremy was unlike the other children at Time I in that he was able to talk and

interact at the same time. Jeremy's ability to perform these acts simultaneously can be explained in terms of notions borrowed from the adult information processing literature. Shatz (1977) has used aspects of information processing theory to account for variation in preschool and school-aged children's conversational skills.

The information processing approach is based on the assumption that humans are limited capacity processors who use information handling techniques as a means of dealing with cognitive workload. Shatz argues that "a particular skill will be revealed most readily when other cognitive demands are minimized. Conversely, the performance of a skill will be most degraded when the task which requires it makes other heavy processing demands" (1977, p. 8). Shatz notes that children often do not display the full range of their linguistic abilities when they have to word hard at the more basic aspects of a task. She proposes "the critical subtask argument" to explain "variation in the complexity of children's utterances" (Ibid., p. 10) in communication tasks. When children are given an easier communication task, their linguistic performance improves. Conversely, when the communication task is harder, their linguistic performance worsens.

At first glance the data for Jeremy does not appear to follow the complexity hypothesis. But at closer inspection of the data, Time II does not contradict the hypothesis because .75 of Jeremy's personal-social functions were doing utterances which were considered personal oriented as compared with social oriented functions. These doing utterances did not require interaction with another. Jeremy's data for Time I, however, needs further consideration.

At Time I, Jeremy used the majority of his utterances for social

purposes. Earlier in the discussion it was suggested that the task of using language for social interaction is harder than using language for non-interactive purposes. Shatz's notion of workload interactions can be used to explain Jeremy's ability to use words for social purposes at Time I. It is suggested that Jeremy adopted a strategy at the lexical level to compensate for the increased demands at the functional level in using words for social interaction. This strategy was to reduce the lexical diversity of his utterances as evidenced by the low type token ratio (the number of different words divided by the number of words) at Time I. In his first observation Jeremy used 7 different words in a 30 utterance sample (type token ratio = .23). This was the lowest type token ratio of the 24 samples. Further evidence for his lack of lexical diversity is the finding that the word "mom" accounted for .77 of his Time I utterance tokens.

Thus, it is hypothesized that Jeremy's limited lexical diversity displayed at Time I was his strategy for dealing with the demands of using language for social interaction. Because of the greater demands of the task at the functional level, Jeremy simplified the processing demands at the lexical level. This notion further supports the view of language use as a synergistic, interactive process.

Developmental Changes in the Use of Categories of Words

Some of the categories of form were used for object oriented functions first and social functions later. This trend was most common among the children in their use of general nominals, but was also observed for individual children for pronouns and action words. Six children (all but Jeremy and Adam) used general nominals first for

labels (considered an object oriented function in this study) and later for the instrumental (considered a social oriented function in this study) function. The frequency of use of general nominals for the instrumental function accounted for less than 5% of the data for three of these six children so that this form/function combination does not appear in Table 10 or Appendix C which list the more frequently used form/function combinations. This low frequency of occurrence further suggests that the use of general nominals for the instrumental function was just beginning to emerge at the end of the single-word period.

As noted above, two children, Jeremy and Adam, were unlike the others in their change in the use of general nominals. Jeremy, who was the slowest child to reach the 50 word level, first used general nominals at Time III. Although that was the last observation in the study, he was like the other children in that he first used general nominals for an object oriented function.

Adam's use of general nominals did not conform to this shift from more object to social oriented functions. He used general nominals for labels in both the first and last observations. He did not use any general nominals at Time II. Adam's use of pronominals shifted from more object to social oriented uses over time. In the first observation, he used pronominals for the indicative, an object oriented, function. Although Adam also used pronouns for the instrumental function at Time I, he increased the frequency of use of pronouns for the instrumental function from Time I to Time II and continued to use them for the instrumental function at Time III.

A final example of increased social uses of categories of words over time comes from Lauren's use of action words. She first used

action words for doing, a personal function, and later for the regulatory, a social function. These examples suggest that children may first use categories of forms for functions that do not involve interaction, then later use them for functions that require interaction, a more complex activity.

This notion of complexity has been used to explain relationships among aspects of language at later stages of development. For example, Bloom, Miller & Hood (1975) found that certain types of complexity constrained children's utterance length and occurred more frequently in two, as compared with three, constituent relations. These investigators found that negation and two part verbs such as "put on" constrained the number of major constituents an utterance contained as did the embedding of the semantic relations, possession, recurrence, and attribution. In terms of the present study, this notion of complexity suggests a synergistic relationship between pragmatic development and lexical use.

Functional Styles

In contrast to the children who demonstrated a shift from more object oriented uses of words at the beginning of the investigation to more personal-social uses later in the study, there were children whose pragmatic development did not conform to this pattern. Three children emphasized the same type of functions over the three time periods. These children had a preference for one group of functions over the other and their data support the notion of developing particular styles of communicative functions and maintaining those styles throughout the single-word utterance period. Both styles described in the individual differences literature emerged from the data of this investigation.

Throughout the study, one child emphasized object oriented functions and the others used mostly personal-social functions. Similar differences in functional emphasis in the single word period were reported by Barrett (1981) and Dore (1973; 1974). The data of this study suggest that there is not one pattern of functional development appropriate to account for all children.

The variation which emerged in this study suggests that there are limitations in models of language acquisition derived from descriptions of only one child. For example, the sequence of earlier interpersonal, affective uses of terms followed by later referential uses that Dore's son displayed (Dore, in preparation) was similar to the pattern which emerged for one child in this study. Jeremy used mostly personal-social functions earlier in the one word stage and did not begin to label objects until Time III. However, there were additional patterns of acquisition which characterized the functional development of the other children. In contrast to the pattern of development described in Dore's (in preparation) lexical phase model, some children in this study used words for naming at the beginning of the one word stage.

Although the present sample is small, it seems likely that the patterns observed in this investigation would emerge across a larger sample of children. Future longitudinal studies of pragmatic development would be necessary to confirm the development of both the consistent functional styles and the functional shifts over time.

Another potential factor which may have influenced the different patterns observed is context. Both the forms and functions of children's speech may vary in different situations. Future research should include analyses of the ways in which children's speech varies as a function of context.

Form and Function

The two children in this study who had significant functional preferences throughout the entire data collection period each acquired the associated lexical style. That is, the object oriented child acquired a referential vocabulary and the personal-social oriented child developed an expressive lexicon based on the number of different general nominals among their first fifty words (Nelson, 1973). These data suggest an interaction between form and function and are consistent with Barrett's (1981) report that his referential subject used more object oriented functions whereas his expressive subject used more social oriented functions. The data from this study and Barrett's (1981) lend some support to Nelson's (1973) hypothesis that referential children view language as a means of talking about the world, whereas expressive children view language as a means of social interaction.

However, not all of the referential and expressive children in this study used the majority of their utterances at all sessions for the expected functions. This finding is explainable as follows. First, most of the children's development of functions was characterized by shifting preferences in communicative functions rather than by the use of a consistent functional style throughout. This suggests that most children develop a relatively balanced repertoire of communicative functions including both the object oriented and personal-social domains of language use. The four expressive children who shifted their use of functions over time had a majority of personal-social uses in two of their three sessions, one of which was significant, indicating a tendency in the expected direction toward more personal-social

functions. The functional tendencies of two referential children were not in the expected direction with one using mostly personal-social functions in two sessions and the other referential child have a majority of personal-social uses of language in all three observations.

The discrepancies between the expected and observed functional tendencies for these referential children may be related to possible problems with the reliability of the cumulative vocabulary records upon which their lexical style designations were based. Because the referential-expressive classifications were based on the cumulative vocabulary records whose primary source of input was the diary data, some of the referential-expressive designations themselves may be of questionable reliability. One methodological problem encountered during the course of data collection suggested this possibility.

During the course of transcribing the videotapes, the investigator occasionally found words in the samples not entered by the mothers in the diaries. When this occurred, the investigator reported the word to the mother. If the mother did not recall her child having used the word prior to the observational session, the date and context of the videotaping was used for the first occurrence. The time of the observation could have been the occasion for the children's first use of some words, but it was unlikely the case for every word first observed in a videotaped session. That this happened with a degree of regularity was somewhat surprising because the biweekly home visits and questioning the mothers regarding the children's use of new words were two precautions taken in an attempt to alleviate this potential problem.

Of greater interest than the observation that mothers omitted

words from the diaries was the finding that the type of words mothers omitted were not general nominals. For example, for Jamie, one of the referential children, five words ("more," "up," "this," "that," and dirty") used in her first videotaped sample were not entered in her diary at the time of the observation. Additional examples occurred with the other children.

In addition to the videotaped observations, the investigator occasionally observed the children using words not entered in their diaries during the home visits as well. Examples included Rachel's use of "this" and Lauren's use of "what this," again not general nominal forms. These instances, among others, suggest that the mothers tended to equate general nominal forms with the concept of words more readily than with other types of forms. As a result, the mothers may have tended to underestimate their children's use of words classified as pronominals, formulas, modifiers, etc. This tendency of maternal underestimation of forms that were not general nominals suggests that in future studies of early vocabulary development which necessitate collaboration between investigator and parental diaries, greater emphasis should be given to increasing the parents' awareness of children's use of different types of words that are not general nominals.

Whereas maternal underestimation of forms not considered general nominals was a consistent finding, there was probably an overestimation of general nominals in Adam's data. The comparison of the proportion of general nominal types in his cumulative vocabulary record and Time III observation supports this claim. Adam was an unintelligible child whose mother reported that she had difficulty

understanding his speech. Tangible referents may make general nominals relatively easier to recognize than non-general nominals especially if the child is difficult to understand. Consequently, Adam's mother may have overestimated his acquisition of general nominal forms.

Because of the problems of reliability associated with diary data, this study was designed so that observational data was the primary source of information used to answer questions regarding the relationship between the use of forms for different functions. The data from the Time III observation in contrast to the cumulative vocabulary records indicated that children who used mostly general nominal forms also used language for mostly object oriented functions. Similarly, the data indicated that children who used relatively fewer general nominals also used proportionately fewer object oriented functions and more functions of a personal-social nature. These observational data indicate that the use of general nominal forms is consistent with functional preference at this point in early language development; however, it is not necessarily related to the number of nominal forms learned as indicated in vocabulary records.

These data on the frequency of forms and functions used support the notion of an interaction between the lexical and pragmatic domains of language. The data indicated that children who used mostly nominals were, in fact, using language for more referential, object oriented purposes whereas children who used fewer nominals were using language for more personal-social functions. The data suggest that children who use language mostly to talk about their world use more names of objects. Children who use language for more interactive purposes also use object names, but not as frequently as those

children who use mostly object oriented functions. These frequency of use data indicate relationships between form and function but do not provide evidence for a direction of influence. However, some specific examples from the data suggest that the observed interaction of form and function in the period of early vocabulary growth seems to be an instance of form following function rather than function following form.

Data from the two children who had significant functional preferences throughout the study illustrate that the acquisition of types of words did not predict the types of functions used. The data suggested that the children's functional orientation may have influenced their selective use of lexical items already acquired. The distinction between lexical acquisition and lexical use mentioned earlier was an important one which emerged from the data.

At the time of the first observation, the object oriented referential child and the personal-social expressive child each had acquired eight different words that could potentially be used to refer to objects. Jeremy had acquired four general nominals and four pronominals and Steven had acquired seven general nominals and one pronominal. Although Jeremy had fewer general nominals and more pronominals than Steven, the boys had acquired the same number of words across these two categories of form that can serve similar functions. If function follows form, one would predict that these children with comparable forms would have used a similar range of functions. However, this was not the case as one boy had significantly more personal-social uses of language and the other had significantly more object oriented uses. The object oriented child used his general nominal and pronominal forms frequently and when he did so, used them to label and

indicate objects. The other child only used one general nominal token in his first sample and it served a personal-social function. He did not use any of his pronominals. These data suggest the possibility that functional orientation influenced the use of forms already acquired. While this example negates the original idea of a form/function relationship relative to acquisition, it strongly suggests the notion of a form/function relationship relative to use. In other words, the functional preferences of the children, who had comparable lexical equipment available, influenced their selective use of particular functions which predicted the frequency of use of different types of forms but not which forms were acquired at the ten word level. However, the functional styles of these two children did predict the makeup of their lexicons at the 50 word level with the object oriented child acquiring a greater number of general nominals.

Additional evidence to support the notion that functional styles predicted the frequency of use of forms was provided by the specific nominal category. Both the object oriented, referential child and the personal-social, expressive child had acquired the same two specific nominals, "mommy" and "daddy." At Time I neither child used "daddy" which was not surprising since neither child's father was present for the videotaping. On the other hand, it was expected that both boys would use "mommy" since their mothers were present during the entire observational sessions. However, Jeremy, the expressive child used "mommy," but Steven, the referential child, did not. As was the case with the general nominal and pronominal forms just mentioned, this specific nominal example further illustrates that the acquisition of a form does not predict its use. In the case of "mommy" there was

ample opportunity for both boys to use the form if they chose to.

The word "mommy" was the expressive child's most frequent utterance token at Time I. He used this word for many different functions including the instrumental, regulatory, protest/rejection, interactional, call, and show/give/take each which involved social interaction. These data suggest that the child's use of forms in his repertoire may be tied to what he views the function of language to be. Although acquiring a form did not predict the type of functions used, the use of particular functions seemed to predict the frequency of use of forms already acquired.

Unifunctional and Multifunctional Use of Forms

The finding that forms were used for several different functions, rather than for one function, also related to the issue of the relationship between form and function in early language development. The data indicated that the children used a category of form for several different functions such as the use of general nominals for labelling, the heuristic and instrumental functions and the use of personal-social words for the personal and interactional functions, routines, greetings, affirmation/denials, and protest/rejections. Further, while the data suggested some commonalities among the children for the more frequently occurring form/function combinations, there was a tendency for the children to use idiosyncratic form/function combinations such as the use of specific nominals to protest/reject.

The analysis of the range of functions expressed through words used more than once in the first observation indicated that some words served one function while more words were used for several functions.

This suggests that children tend toward multifunctional uses of words from an early point in their language development and that words, even at the beginning of the single-word period, are not function bound. Halliday's (1975) hypothesis that words at first serve one function was not supported by the data. Halliday's evidence for the notion of a one to one correspondence between form and function was based on only one child. One of the children in this study, too, used particular words at Time I for only one function. However, the other seven children, the vast majority of subjects, used their words for both singular and multiple functions indicating that both coexist. In the present study, multifunctional uses of words were more common than unifunctional uses further negating the notion of a one to one correspondence between form and function. Barrett (1981) also reported that the two subjects he observed at similar developmental levels used some of their expressions for a variety of different functions. The discrepancies between Halliday's (1975) suggestion of a one form/one function relationship and the findings of this and Barrett's (1981) study may be due to methodological differences in data collection in addition to the number of subjects observed. The use of videotaped data in this and Barrett's (1981) study enabled the investigators to carefully examine the full range of functions served by particular utterances.

In conclusion, the results of this study indicated that most early forms are not tied to particular functions, but can be used for expressing a range of functions. The results also indicated that the functional orientations of the children predicted the types of words they used most frequently. Functional orientation predicted the types

of words acquired only for the referential and expressive children who displayed constant functional preferences throughout the entire single-word utterance period. The data indicated that having acquired forms did not predict the use of those forms nor particular functions. Rather, functional orientation predicted the children's use of forms already in their repertoire. These results suggest a strong interaction between form and function relative to use. An interaction between form and function relative to acquisition exists, only for those children with definite functional styles.

The data from this study suggest variability in the relationship between the development of functions and lexical acquisition. Two children demonstrated a robust interaction between functional and lexical development and one child's data indicated a lack of relationship between these two aspects of language development. The data for the remaining five children showed a tendency toward a relationship between functional and lexical acquisition. This variability in the relationship between the development of form and function suggests that a functional view of language development is insufficient to account for the differences that exist among children in this early period. Although the study of the role of function in language development is an important one that has revolutionized the way language acquisition is viewed, its role in the acquisition of forms, at least at the single-word level, may be limited.

The Alternative Proposals

Two alternative explanations for the types of early words children learn, level of means-end cognitive abilities and maternal speech style, were explored. Each of these areas will be discussed below.

Means-end Cognitive Ability

To the investigator's knowledge, this was the first study which directly examined the relationship between level of means-end cognitive abilities and the lexical style phenomena. Level of means-end cognitive abilities as measured by the Uzgiris-Hunt (1975) scale did not differentiate the children in terms of lexical style or functional orientation suggesting that level of means-end cognitive abilities assessed in this manner is not an important factor in explaining differences in lexical style.

Means-end ability was chosen as a cognitive domain possibly related to style differences in early language development because earlier investigators (Snyder, 1975; Bates et al., 1977) reported relationships between language and level of means-end ability. However, different aspects of language were examined in the studies. For example, this study examined type of vocabulary words learned, whereas Bates et al. (1977) included vocabulary size differences in their language production measure. Snyder (1975) did not examine any aspect of vocabulary in her study, rather she investigated children's use of speech acts. The studies also differed in the pragmatic abilities explored. Bates et al. examined both linguistic and nonlinguistic communicative abilities, but did not focus on specific functions or groups of functions as was the case in this study. Snyder (1975) examined two different functions or speech acts. Her protoimperative speech act was similar to the instrumental and regulatory functions of this investigation. Her protodeclarative speech act as defined did not map onto any of the categories of functions used in this study but has some similarity with the showing

function which emerged from the data in this investigation. However, because showing objects to adults was combined with the acts of giving and taking objects from others in this investigation, the categories are not comparable.

Further, in the present investigation, the children's full range of functions were allowed to emerge in everyday situations whereas the two functions Snyder (1975) studied were elicited in experimental contexts. Perhaps the relationship between level of means-end ability and pragmatic behaviors Snyder found were related to similarities between the task oriented nature of the performative elicitation procedures and the task oriented nature of the Uzgiris-Hunt (1975) scales. Perhaps there would be relationships among naturalistically assessed pragmatic behaviors and naturalistically assessed cognitive skills as well. For example, the domain of play which can be tapped more readily in naturalistic contexts than means-end behavior may be a more fruitful area to explore the relationship of cognitive ability to children's lexical and pragmatic stylistic differences. Bloom & Lifter (1983) note that comparability between language and cognition is limited to the extent that cognitive and linguistic behaviors are examined under different conditions.

In addition, perhaps differences in cognitive styles (e.g., Wolf & Gardner, 1979) rather than differences in cognitive levels would account for differences in children's lexical styles. Although a relationship between the style phenomena and the means-end cognitive domain was not borne out by the present study, the possibility of a relationship between other aspects of cognition and language remains. The cognitive aspect of this study was limited in scope in that only

one cognitive ability, means-end behavior, was examined. Another cognitive ability worth pursuing in future research would be the exploration of a relationship between cognitive and linguistic styles perhaps through an investigation of naturally occurring play behaviors. Relationships between aspects of language and play have been reported by other investigators (e.g., Nicolich, 1975; Rocissano, 1979; Lifter, 1982).

Maternal Speech Style

Maternal speech style, like level of means-end behavior, was examined to determine whether or not it could account for the children's lexical style differences which emerged from the data. In contrast to level of means-end cognitive ability, maternal speech style was related to lexical style.

For the two mothers studied the style of maternal speech (as judged by the number of general nominals, object references, and object oriented functions) matched the style of her child. The mothers also significantly differed from each other on each of the measures used suggesting that there may be referential and expressive styles of motherese. Certainly these findings must be considered preliminary because 1) a relatively small sample of the mothers' speech was analyzed and 2) the analysis was performed on only two of the participating mothers. However, when viewed in conjunction with other recent investigations, the results suggest that maternal speech may be an environmental factor which is a reflection of the lexical style differences among children. The findings of this investigation will be discussed relative to those recent studies (Klein, 1980; Della Corte, Benedict, & Klein, 1983; Furrow & Nelson, in press) which have

examined the speech of mothers whose children have distinct lexical styles.

The design of the analysis of the mothers' speech used in this study most closely approximated Klein's (1980). Both studies sampled the mothers' speech in a caretaking and play context. The categories used to code the mothers' speech were also similar in that both examined the frequency of common nouns and object references the mothers' used. In both investigations, differences emerged between mothers of referential and expressive children in the expected direction, suggesting that both the content (frequency of object references) and the form (frequency of common nouns) of mothers' speech reflect their children's lexical styles.

In contrast to this study and Klein's (1980) investigation, Della Corte, Benedict & Klein (1983) and Furrow & Nelson (in press) failed to find a significant difference in referential and expressive mothers' use of common nouns. Della Corte, etal. (1983) examined maternal speech characteristics in caretaking situations which, because of the goal-directed nature of such contexts, may have constrained the types of verbal interactions the mothers engaged in. In this study the differences between the two mothers' speech characteristics were minimal in the bath (caretaking, goal-directed) context as compared with the play (object oriented, unstructured) context. The unstructured nature of the play context allows for potential differences between mothers to emerge and is a recommended context for sampling mothers' speech in future studies concerned with maternal speech style characteristics.

The lack of a significant difference between referential and

expressive mothers' frequency of use of common nouns in Furrow & Nelson's (in press) study may have been due to the older age (24 and 30 months) and linguistic maturity of their subjects in comparison with the children in Klein's (1980) and this investigation. Perhaps by the time their children reached two years, even mothers of the referential children ceased to engage in frequent object labelling as their children moved toward syntactic development.

However, Furrow & Nelson (in press) did find that the mothers differed in the frequency of their references to objects and persons, a result consistent with this study and Klein's (1980). Both this investigation and Klein's (1980) found that mothers of referential and expressive children who had not yet reached the fifty word level differed in their frequency of use of object references. Furrow & Nelson (in press) reported that mothers of referential and expressive children beyond the 50 word level continue to differ from each other in this aspect of their speech. The results of these studies together indicate that the content of maternal speech, specifically the frequency of object vs. person references, varies with referential and expressive differences among children.

In the present investigation, the referential and expressive mothers also differed significantly in terms of the functions they used most frequently. The referential mother used more object oriented functions such as labels and comments about objects than the expressive mother. Della Corte et al. (1983) compared referential and expressive mothers on several types of communicative functions. In contrast to this study, these investigators found little differentiation among the referential and expressive mothers on these measures.

Perhaps the contextual constraints of the caretaking situation used by these investigators precluded the emergence of functional differences between the mothers as they suggested for the similar lack of differences in form.

In conclusion, the results of the preliminary analysis of mothers' speech in this study demonstrated that mothers of referential and expressive children differ in areas of language form, content, and use. Other investigators have also found differences between mothers of referential and expressive children in some aspects of language. Together these results suggest that maternal speech styles may be an environmental reflection of the lexical style differences in children. However, it is also possible that the speech styles of the children are influencing their mothers, a possibility raised by Furrow & Nelson (in press) and demonstrated by Lieven (1978). Lieven (1978) showed that an investigator used different speech characteristics when talking with a referential-type as compared with an expressive-type child. It seems likely that influences are bi-directional with both child influencing mother and mother influencing child.

The use of longitudinal data may be a way of answering the question of the direction of the effects. Although the mother-child analysis in this study was longitudinal since the mother's speech was analyzed at Time I and their children's referential-expressive designations were made at Time III, the fact that the children were already talking at Time I leaves the possibility that the children's functional styles were already influencing their mothers' speech characteristics. Perhaps one way of determining whether the direction is from mother to child would be through a longitudinal study

beginning before the child has begun to talk. If mothers of children who eventually develop an expressive style engage in more social types of verbal interactions with their children, then the mother's speech may have influenced the child. Similarly, if the mothers of children who eventually develop referential vocabularies talk more about objects before their children are talking, then the influence may be from mother to child. However, Mazur's (1982) finding that mothers responded with labels when their children pointed to objects suggests an influence from child to mother.

In addition to longitudinal data of mothers' speech collected when their children are prelinguistic, another way of investigating the direction of the influence would be through the use of an interactant not familiar with the child. This procedure is similar to Lieven's (1978) analysis of the variation in her own speech while interacting with two children with different speech styles. However, the use of a person unfamiliar with the purposes of the study and the children would be preferred over having the investigator interact with the children. If the stranger interacts differently with children having different lexical styles, it suggests that there are immediate effects from child to interactant. If there are similarities between the mother's and stranger's speech characteristics in interacting with the same child, it further suggests that the child is cuing the mother (and stranger). This unfamiliar participant paradigm and the prelinguistic longitudinal method are two possible ways of answering the question of directionality of effects.

Summary and Conclusion

This study explored the issue of the relationship between form

and function in early language development. The study examined children's functional development during the period of acquisition of their first fifty words. The personal-social and object oriented categorization of functions was aimed at capturing individual differences in functions that would be consistent with the variation that has been described in the development of other aspects of language. This study focussed on the influence of function on the development of form and explored other interactions between form and function in the period of early lexical growth. The results indicated that children having distinct functional styles developed the associated referential and expressive lexicons, but not all children who acquired a referential or expressive lexical style demonstrated constant functional preferences. Problems related to the reliance on diary data for this part of the study were considered as possibly confounding these results. However, functional preferences were consistently related to the frequency of use of forms based on the observational data.

A one to one relationship between form and function was not borne out by the data as children used many of their early words for more than one function. The data also indicated that there were more differences than similarities among the form/function combinations children used most frequently providing evidence for another aspect of individual variation in early language development.

There were also differences among the children in terms of patterns of functional development. Some children consistently emphasized the same type of functions throughout, whereas other children shifted their preferences over time. Those who changed their functional preferences used more object oriented utterances at the beginning of the

single-word period and more personal-social functions by the middle or end of the one word stage. A trend in increased social uses of language was identified post hoc. It was suggested that the use of words for these social functions may be more complex, because of the dual requirement of producing a linguistic utterance and interacting with another person, than the object oriented functions which were used more frequently at the beginning of the study. This dual requirement of producing a word while interacting with others did not apply in the case of nonlinguistic utterances which are conducive to expressing more personal-social types of functions. A reduction in lexical diversity was suggested as a strategy used by the one child who used words for mostly social functions at the beginning of the single-word period.

Two alternative explanations for the style phenomena were explored in this study. Level of means-end cognitive ability as measured by the Uzgiris-Hunt (1975) scale was not related to the lexical or functional differences among the children. Suggestions were made for future research examining cognitive style differences between referential and expressive children through an analysis of their play.

In contrast to results on means-end tasks, mothers' speech style was related to the referential-expressive differences between two of the children, a finding consistent with other recent studies. From these data, conclusions were not drawn regarding the direction of influence from mother to child or from child to mother. However, two suggestions for future research designed to answer the question of directionality were offered.

APPENDIX A

DIARY OF VOCABULARY DEVELOPMENT PROCEDURES FOR PARENTS

The purpose of the diary you are being asked to keep is to develop an accurate record of your child's early language development. This record is necessary because you are likely to be the one who observes new developments in your child's language growth. Another reason that this record is important is that the language that your child uses in the home video observations may not be representative of what your child can say.

Specifically, I am interested in your describing any vocalizations (or combination of vocalizations) your child produces to express consistent meaning. Some of these vocalizations may sound similar to an adult word (e.g., "baw" for "ball"), but some of them may not (e.g., "t-t-t" for "clock"). For the purpose of the study and throughout this Appendix, we will refer to vocalizations (or combinations of vocalizations) used with consistent meaning as "words," whether or not they sound like corresponding adult words.

Since a major concern of the study is the context of the first use of the "words" your child will acquire, it is especially important that you fill in the information under all the column headings as accurately and completely as possible. It is recommended that you make the entries for a new word as soon after it occurs as is feasible.

You are requested to describe 1) the words that your child says, 2) the dates of their first meaningful use, 3) their adult equivalents, 4) whether or not they are imitated, that is, said right after someone else said the same word, 5) whether or not your child's words are directed to someone or something, 6) who your child was with when s/he said the word, 7) where s/he was, 8) what was going on at the time that s/he produced the word, 9) what s/he meant in saying it, and 10) if s/he used it again.

When to Make an Entry in the Diary

Make an entry whenever your child produces any vocalization (or combination of vocalizations) meaningfully. As noted above those vocalizations used with consistent meaning are referred to as "words" whether or not they sound like a corresponding adult word. If you are home when your child says a new word, it is best to make the entry immediately. If you are not home when the new word is used, make the entry as soon after as is possible.

How are Diary Records Kept?

You will be provided with special Diary Record forms in a booklet, My Baby's First Words. The forms are divided into eleven columns. Each column heading specifies the information you are requested to enter under it. You will be provided with as many forms as you need. At the end of the study, if you wish, you will be given a copy of the diary booklet to keep as part of your baby's records.

What is to be Recorded in the Diary?

The study you are participating in concerns the early words your child uses meaningfully. Indicate the date that a word is first

used, with meaning and the sequence of acquisition, that is, 1 for the first, 2 for the second, and so on. The date and number for each go in the first and second columns, respectively. The child's word and the corresponding adult words go in the third and fourth columns, respectively.

Was the Child's Word an Imitation?

If your child's first use of a word is an imitation, that is, repeated after you or someone else just said it, write "yes" in column 5 and complete columns 6 through 10. Do not fill in column 11. Make another entry for that same word if and when your child subsequently uses it without repeating after someone else, that is, when you can write "no" in column 5 for that word. Fill in the information requested in columns 6 through 10 and check subsequent nonrepetitive uses of the word in column 11. Refer to the example of the child's word "hos" for the adult's word "hot" on the Sample Diary Record at the end of these instructions regarding how and when to enter information regarding imitation.

Did your Child Direct the Word to Someone, Something, or Nothing Apparent?

One purpose of the study is to describe which words are directed to people, which are directed to objects, and which are not directed to anyone or anything in particular. If your child seemed to direct his word to someone, enter that person's relationship to the child (e.g., M = mother) in column 6. If s/he seemed to direct the vocalization to an object, write the name of the object. If your child did not appear to direct the vocalization to anyone or anything in particular, write the words "nothing apparent."

Who was Present?

Indicate any persons in the immediate area when your child said the word, whether or not it was directed toward any of them. This information goes in column 7.

Where was your Child when S/he Said the Word?

Indicate whether your child was home or on an outing (and if so, where) when s/he spoke the word. If home, enter the room your child was in and other important aspects of location (e.g., in highchair). Enter this information in column 8.

What was Happening when your Child Said the Word?

Describe 1) objects within the sight and/or reach of your child, 2) what s/he was doing including actions and gestures such as pointing and reaching, 3) the mood s/he was in (e.g., happy, irritable), 4) the presence of other people, and 4) their activity. This information goes in column 9.

What did your Child Mean?

This category is useful in helping to determine what your child meant in saying something. When making an entry under this heading, try to put your child's meaning into words as illustrated in column 10 on the Sample Diary Record. It is important to write down the reason your child said something only when you are not guessing at what s/he meant. If you have no idea what your child meant, do not fill in anything. This information is optional.

Has your Child Said the Word Again?

In this study, a word will be counted as part of your child's cumulative vocabulary if s/he uses it at least five different times. Repetition of the same word, that is, saying it two or more times in sequence (e.g., "cat, cat, cat"), will count as one instance of that word. The last column of the Diary Record is for the purpose of indicating subsequent uses of the words you have entered in the diary. There are four spaces for you to check (✓) if your child uses the word again. Thus, the first use is indicated by date of occurrence in column 1 and the four subsequent nonrepetitive, that is, nonsequential, uses are indicated by four checks in column 11. After that, you do not need to enter subsequent uses of the word.

APPENDIX B

THE CUMULATIVE VOCABULARY RECORDS OF THE EIGHT SUBJECTS

MICHAEL'S CUMULATIVE VOCABULARY RECORD

	Form	Category
1.	mommy	Specific Nominal
2.	daddy	Specific Nominal
3.	bottle	General Nominal
4.	me	Pronominal
5.	yeah	Personal-social
6.	Scott	Specific Nominal
7.	brm	Action
8.	Michael	Specific Nominal
9.	Grandpa	Specific Nominal
10.	broom	General Nominal
11.	baby	General Nominal
12.	bean	General Nominal
13.	ruff (dog)	General Nominal
14.	hot	Modifier
15.	Piggy (Miss Piggy)	Specific Nominal
16.	Joyce	Specific Nominal
17.	Blaze	Specific Nominal
18.	spaghetti	General Nominal
19.	light	General Nominal
20.	pea	General Nominal
21.	Ann	Specific Nominal
22.	bye	Personal-social
23.	Boppy	Specific Nominal
24.	more	Modifier
25.	yummy	Modifier
26.	T.V.	General Nominal
27.	ball	General Nominal
28.	bead	General Nominal
29.	down	Action
30.	back (put it back)	Formula Fragment
31.	eggs	General Nominal
32.	dirty	Modifier
33.	men	General Nominal
34.	boots	General Nominal
35.	money	General Nominal
36.	medicine	General Nominal
37.	Peggy	Specific Nominal
38.	ring	General Nominal
39.	Annie	Specific Nominal
40.	water	General Nominal
41.	happy (laughing)	Equivocal(Modifier-Action)
42.	pretty (makeup)	General Nominal
43.	wet	Modifier
44.	oh	Personal-social
45.	bone	General Nominal
46.	Pepper	Specific Nominal
47.	George	Specific Nominal
48.	butter	General Nominal
49.	Lisa	Specific Nominal
50.	door	General Nominal

STEVEN'S CUMULATIVE VOCABULARY RECORD

	Form	Category
1.	this	Pronominal
2.	mommy	Specific Nominal
3.	bye	Personal-social
4.	daddy	Specific Nominal
5.	yes	Personal-social
6.	hi	Personal-social
7.	juice	General Nominal
8.	moo (cow)	General Nominal
9.	dog	General Nominal
10.	hungry	Modifier
11.	keys	General Nominal
12.	clock	General Nominal
13.	whee	Action
14.	car	General Nominal
15.	cup	General Nominal
16.	oh	Personal-social
17.	I did it	Formula
18.	cookie	General Nominal
19.	meow (cat)	General Nominal
20.	baby	General Nominal
21.	spoon	General Nominal
22.	finished	Modifier
23.	shoes	General Nominal
24.	down	Action
25.	T.V.	General Nominal
26.	bus	General Nominal
27.	truck	General Nominal
28.	cat	General Nominal
29.	ball	General Nominal
30.	go	Action
31.	do it again	Formula
32.	quack	General Nominal
33.	me	Pronominal
34.	bubble	General Nominal
35.	that	Pronominal
36.	lion	General Nominal
37.	duck	General Nominal
38.	beep-beep	General Nominal
39.	teeth	General Nominal
40.	tractor	General Nominal
41.	roar	General Nominal
42.	choo-choo (train)	General Nominal
43.	bottle	General Nominal
44.	two	General Nominal
45.	no	Personal-social
46.	three	Personal-social
47.	baa	Personal-social
48.	oink	Personal-social
49.	please	Personal-social
50.	peanut butter	General Nominal

JEREMY'S CUMULATIVE VOCABULARY RECORD

	Form	Category
1.	cat	General Nominal
2.	mommy	Specific Nominal
3.	bird	General Nominal
4.	up	Action
5.	daddy	Specific Nominal
6.	ok	Personal-social
7.	brm	Action
8.	hot	Modifier
9.	book	General Nominal
10.	that	Pronominal
11.	this	Pronominal
12.	David	Specific Nominal
13.	here	Pronominal
14.	ball	General Nominal
15.	mine	Pronominal
16.	nana (to nurse)	Action
17.	hi	Personal-social
18.	no	Personal-social
19.	bye	Personal-social
20.	ruff (sound of dog)	Personal-social
21.	vroom (airplane)	General Nominal
22.	there	Pronominal
23.	moo	General Nominal
24.	blah (dirty)	Modifier
25.	uh oh	Personal-social
26.	good	Modifier
27.	down	Action
28.	Grandma	Specific Nominal
29.	two	General Nominal
30.	go	Action
31.	yes	Personal-social
32.	bulldozer	General Nominal
33.	big	Modifier
34.	key	General Nominal
35.	choo choo (train)	General Nominal
36.	over there	Formula
37.	S	General Nominal
38.	bang	Action
39.	beads	General Nominal
40.	bee	General Nominal
41.	Bert	Specific Nominal
42.	pow	Action
43.	Grandpa	Specific Nominal
44.	baby	General Nominal
45.	cheese	General Nominal
46.	Joel	Specific Nominal
47.	B	General Nominal
48.	blue	General Nominal
49.	downstairs	Action
50.	owl	General Nominal

ADAM'S CUMULATIVE VOCABULARY RECORD

	Form	Category
1.	down	Action
2.	up	Action
3.	mommy	Specific Nominal
4.	cup	General Nominal
5.	Courtney	Specific Nominal
6.	duck	General Nominal
7.	daddy	Specific Nominal
8.	light	General Nominal
9.	fish	General Nominal
10.	clock	General Nominal
11.	banana	General Nominal
12.	hat	General Nominal
13.	powder	General Nominal
14.	tree	General Nominal
15.	truck	General Nominal
16.	this	Pronominal
17.	bus	General Nominal
18.	bagel	General Nominal
19.	hot	Modifier
20.	milk	General Nominal
21.	row-row (your boat)	Formula Fragment
22.	nose	General Nominal
23.	open	Action
24.	that	Pronominal
25.	I see you	Formula
26.	clown	General Nominal
27.	apple	General Nominal
28.	here	Pronominal
29.	books	General Nominal
30.	eyes	General Nominal
31.	plug	General Nominal
32.	turtle	General Nominal
33.	blanket	General Nominal
34.	hi	Personal-social
35.	music	Action
36.	bread	General Nominal
37.	Josh	Specific Nominal
38.	berries	General Nominal
39.	juice	General Nominal
40.	want	Action
41.	vitamins	General Nominal
42.	what that	Formula Fragment
43.	lolly pop	General Nominal
44.	car	General Nominal
45.	I want this	Formula
46.	what this	Formula Fragment
47.	Spidey (Spiderman)	Specific Nominal
48.	toothbrush	General Nominal
49.	toothpaste	General Nominal
50.	grandma	Specific Nominal

JAMIE'S CUMULATIVE VOCABULARY RECORD

	Form	Category
1.	bye-bye	Personal-social
2.	hot	Modifier
3.	mommy	Specific Nominal
4.	daddy	Specific Nominal
5.	hi	Personal-social
6.	cookie	General Nominal
7.	bottle	General Nominal
8.	Howie	Specific Nominal
9.	ball	General Nominal
10.	quiche	General Nominal
11.	dirty	Modifier
12.	key	General Nominal
13.	more	Modifier
14.	that	Pronominal
15.	this	Pronominal
16.	up	Action
17.	shoe	General Nominal
18.	hurray	Personal-social
19.	no	Personal-social
20.	duck	General Nominal
21.	bird	General Nominal
22.	gimme (give me)	Action
23.	fish	General Nominal
24.	doll	General Nominal
25.	dog	General Nominal
26.	Muffy	Specific Nominal
27.	orange	General Nominal
28.	nice	Action
29.	peaches	General Nominal
30.	cheerios	General Nominal
31.	nose	General Nominal
32.	water	General Nominal
33.	pig	General Nominal
34.	car	General Nominal
35.	whee	Action
36.	yeah	Personal-social
37.	doody	General Nominal
38.	uh oh	Personal-social
39.	horse	General Nominal
40.	yak	General Nominal
41.	baby	General Nominal
42.	turtle	General Nominal
43.	apple	General Nominal
44.	camel	General Nominal
45.	banana	General Nominal
46.	puppy	General Nominal
47.	down	Action
48.	egg	General Nominal
49.	tissue	General Nominal
50.	boo-boo	General Nominal

NADINE'S CUMULATIVE VOCABULARY RECORD

	Form	Category
1.	hi	Personal-social
2.	more	Modifier
3.	yay	Personal-social
4.	hello	Personal-social
5.	no	Personal-social
6.	wow	Personal-social
7.	up	Action
8.	down	Action
9.	ok	Personal-social
10.	bye	Personal-social
11.	cheese	General Nominal
12.	what this	Formula Fragment
13.	duck	General Nominal
14.	whee	Personal-social
15.	daddy	Specific Nominal
16.	kiss	Action
17.	bottle	General Nominal
18.	oh	Personal-social
19.	uh oh	Personal-social
20.	baby	General Nominal
21.	book	General Nominal
22.	diaper	General Nominal
23.	nice	Action
24.	good	Modifier
25.	cracker	General Nominal
26.	apple	General Nominal
27.	banana	General Nominal
28.	nose	General Nominal
29.	eyes	General Nominal
30.	mommy	Specific Nominal
31.	papa	Specific Nominal
32.	juice	General Nominal
33.	socks	General Nominal
34.	allgone	Modifier
35.	don't cry	Formula
36.	this	Pronominal
37.	please	Personal-social
38.	bow wow (dog)	General Nominal
39.	upsidaisy	Action
40.	egg	General Nominal
41.	peek-a-boo	Personal-social
42.	see	Action
43.	yes	Personal-social
44.	eat	Action
45.	delicious	Modifier
46.	keys	General Nominal
47.	Nadine	Specific Nominal
48.	one-two	Personal-social
49.	walk	Action
50.	me	Pronominal

LAUREN'S CUMULATIVE VOCABULARY RECORD

	Form	Category
1.	daddy	Specific Nominal
2.	mommy	Specific Nominal
3.	Jennifer	Specific Nominal
4.	brm	Action
5.	teddy (bear)	General Nominal
6.	woof-woof	General Nominal
7.	whee	Action
8.	hot	Modifier
9.	moo (cow)	General Nominal
10.	boom	Action
11.	hi	Personal-social
12.	that	Pronominal
13.	oh	Personal-social
14.	this	Pronominal
15.	nana (grandma)	Specific Nominal
16.	juice	General Nominal
17.	what this	Formula Fragment
18.	what that	Formula Fragment
19.	who this	Formula Fragment
20.	Bear	Specific Nominal
21.	here	Pronominal
22.	pop (lolly pop)	General Nominal
23.	light	General Nominal
24.	bye	Personal-social
25.	hat	General Nominal
26.	who that	Formula Fragment
27.	shoe	General Nominal
28.	sock	General Nominal
29.	kite	General Nominal
30.	no	Personal-social
31.	boat	General Nominal
32.	three	Personal-social
33.	mine	Pronominal
34.	baby	Specific Nominal
35.	up	Action
36.	bird	General Nominal
37.	poo (dirty diaper)	General Nominal
38.	cheese	General Nominal
39.	ball	General Nominal
40.	I see (I see you)	Formula Fragment
41.	out	Action
42.	eye	General Nominal
43.	cute	Modifier
44.	wow	Personal-social
45.	teeth	General Nominal
46.	balloon	General Nominal
47.	me	Pronominal
48.	one-two	Action
49.	cookie	General Nominal
50.	book	General Nominal

RACHEL'S CUMULATIVE VOCABULARY RECORD

	Form	Category
1.	daddy	Specific Nominal
2.	hi	Personal-social
3.	this	Pronominal
4.	duck	General Nominal
5.	that	Pronominal
6.	hot	Modifier
7.	down	Action
8.	banana	General Nominal
9.	Lindsay	Specific Nominal
10.	cookie	General Nominal
11.	juice	General Nominal
12.	apple	General Nominal
13.	go	Action
14.	orange	General Nominal
15.	oh	Personal-social
16.	uh oh	Personal-social
17.	shoe	General Nominal
18.	yes	Personal-social
19.	mommy	Specific Nominal
20.	Cacamun	Specific Nominal
21.	open	Action
22.	hat	General Nominal
23.	Joshua	Specific Nominal
24.	out	Action
25.	cheese	General Nominal
26.	thank you	Personal-social
27.	Rachel	Specific Nominal
28.	Sophie	Specific Nominal
29.	two-three	Personal-social
30.	hair	General Nominal
31.	light	General Nominal
32.	doody	General Nominal
33.	sock	General Nominal
34.	goodbye	Personal-social
35.	no	Personal-social
36.	Bobby	Specific Nominal
37.	here	Pronominal
38.	allgone	Modifier
39.	I do	Formula
40.	yay	Personal-social
41.	pee-pee	General Nominal
42.	more	Modifier
43.	dog	General Nominal
44.	nose	General Nominal
45.	up	Action
46.	eye	General Nominal
47.	these	Pronominal
48.	T.V.	General Nominal
49.	Sandy	Specific Nominal
50.	strawberries	General Nominal

APPENDIX C

THE ABSOLUTE AND RELATIVE FREQUENCY OF FORM/FUNCTION COMBINATIONS ACCOUNTING FOR 5% TO 9% OF INDIVIDUAL SUBJECT'S DATA FOR THE THREE OBSERVATIONS [1]

[1] Form/function interactions accounting for less than 5% of an individual child's sample are omitted because their lower frequencies made them relatively unimportant linguistic behaviors for that child. A few combinations of form with functions coded as repeating, equivocal, and uncategorized occurred between 5% and 9% in some samples, but these are also omitted because these interactions were not of interest in this investigation.

Subject	Time I		Time II		Time III	
	Form/Function	n(%)	Form/Function	n(%)	Form/Function	n(%)
Michael	gen.nom./ comment	3(.09)	action/doing	9(.07)	action/ regulatory	7(.05)
	gen.nom./ instrumental	3(.09)	modifier/instru- mental	8(.06)	action/doing	7(.05)
Steven			per.social/aff./ denial	6(.05)		
Jeremy	spec.nom./call	2(.07)	spec.nom./call	1(.08)	per.social/inter- actional	10(.06)
	gen.nom./show/ give/take	2(.07)	gen.nom./instru- mental	1(.08)		
			per.social/ routine	1(.08)		
Adam	gen.nom./instru- instrumental	2(.07)	pronominal/ heuristic	1(.05)	modifier/comment	9(.09)
	pronominal/ instrumental	2(.07)	action/self-reg.	1(.05)	modifier/regu- latory	7(.07)
	pronominal/ heuristic	2(.07)	formula/instru- mental	1(.05)	spec.nom./pro- test/reject	6(.06)
Rachel	pronominal/ indicative	3(.05)				

Subject	Time I Form/Function	n(%)	Time II Form/Function	n(%)	Time III Form/Function	n(%)
Jamie	spec.nom./protest/rej.	1(.05)	action/doing	6(.06)	gen.nom./instrumental	13(.06)
	gen.nom./label	1(.05)	per.social/protest/rej.	6(.06)	action/regulatory	12(.06)
	action/doing	1(.05)			modifier/comment	10(.05)
	action/comment	1(.05)				
	modifier/instrumental	1(.05)				
	modifier/comment	1(.05)				
	multi w.gen. nom./doing	1(.05)				
Nadine	per.social/indicative	9(.07)	per.social/aff./denial	6(.07)	action/doing	23(.07)
	modifier/instrumental	6(.05)	pronominal/indicative	6(.07)	multi-other/protest/rej.	16(.05)
	form.frag./heuristic	6(.05)				
Lauren			action/doing	3(.09)	per.social/greeting	6(.06)
			spec.nom./call	3(.09)	action/regulatory	5(.05)
			spec.nom./regulatory	2(.06)	per.social/routine	5(.05)
			pronominal/indicative	2(.06)	pronominal/indicative	5(.05)

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