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YOUNG CHILDREN'S RESPONSE TO NOVEL WORDS IN A PLAY SETTING

by

MADELINE L. BOSKEY

A dissertation submitted to the Graduate Faculty in Psychology in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York.

1988

This manuscript has been read and accepted for the Graduate Faculty in Psychology in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

January 26, 1988
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Abstract

CHILDREN'S RESPONSE TO NOVEL WORDS
IN A PLAY SETTING

by

Madeline L. Boskey

Advisor: Professor Katherine Nelson

An important aspect of learning language involves the incorporation of unfamiliar words into a child's existing knowledge about language. A child may responsd to an unknown word in several ways. Based on the linguistic and nonlinguistic context of the utterance in which it occurred, the child might "guess" the meaning of the word. An alternative would be to specifically inquire about the meaning of the unfamiliar word.

A child's choice of strategies for dealing with the new word will affect the maintenance of the discourse situation in which it occurs. By "guessing" the meaning of a word, the disruption to the ongoing discourse would be negligible. Alternatively, if a child specifically queries the meaning of a new word, the flow would be momentarily disrupted.

The present study investigated children's responses to new labels for familiar objects and actions in the course of a play situation. Twenty-four two year olds participated in the study. The experimenter collected a language sample for each child to explore the relationship of measures such as Mean Length of Utterance (MLU) (Brown, 1973), percent of imitation, and degree of Referential/Expressiveness (Nelson, 1973), to performance in the experiment. Children subsequently heard a protocol of sentences that concerned familiar objects and actions and that varied according to whether the target word was the familiar name for the referent or an unfamiliar nonsense word. Several other variables were manipulated, including the type of sentence, the position and part of speech of the target word, to examine the potential effects on performance.

The experimenter coded children's verbal and nonverbal behavior following each item in the protocol. Three response categories, varying in terms of their appropriateness to the discourse, accounted for the childrens's behavior.

In general, the findings indicate that two year olds were more interested in maintaining their communicative play situation than in acquiring specific new names for familiar objects and actions. The type of sentence in which the nonsense word occurred, as well as the age and MLU of the children, affected performance.

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Finally, I would like to express my deepest love and gratitude to my husband, Richard Olsen. His patience, understanding, and nagging enabled me to find the time, the energy and the will to finish. His involvement with me and his joy and pride in my success are testament to his extraordinary capacity to love.

This work is dedicated to the memory of my mother, Rita Boskey (1923-1985) who wanted so much to see it completed.

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Introduction

What occurs when a child hears a new word? How does he or she react to such an encounter? The answers to these questions have implications for understanding the development of vocabulary as well as the growth of communication skills.

A young child encounters many new words each day. Part of the experience of learning language is the incorporation of unfamiliar words into one's existing knowledge about language. Most adults are familiar with the words they hear; a new word is the exception, not the rule. However, a young child's vocabulary, including both production and comprehension, is in a state of rapid growth, so that many the words encountered in any given day may be new.

Consider the following conversation between two adults:

Speaker A: How's your dissertation coming?

Speaker B: Okay. I was trying to get organized, so I just made a punch list.

Speaker A: Oh...What's a punch list?

How do adults cope with the situation of hearing an unknown word in the course of casual conversation? The adult who feels secure in the relationship with the conversational partner might stop and specifically ask about the meaning of the word ("What's a punch list?"). In other cases, the curious conversationalist might decide to feign comprehension, relying on the remainder of the utterance plus the conversational and physical contexts to provide sufficient clues for interpretation. The decision of how to handle the situation takes place quickly, probably within milliseconds, but it is a deliberate choice. What about the case of a child in an analogous situation?

When a child is confronted with novel words, one possible response is to overlook the unknown element and try to process the remainder of the utterance and make sense of it. This type of response might be expected since children do hear many things that are not completely comprehensible and yet require a response. A useful strategy would be to make a "best guess" about what is called for and to give what seems like a reasonable reply. This strategy would facilitate the maintenance of discourse.

What would such a response look like and what kinds of conclusions could be drawn from it? The response might be indistinguishable from a response to more familiar

material. If we were to witness it without being privy to the stimulus that preceded it, we might not be aware that anything unusual had occurred. In terms of interpreting this type of response, we might say that it played a facilitative role for discourse and that, for the child, maintaining the ongoing conversation would supercede a need to interpret elements of the utterance. That is, in such a case, the urge to keep the conversation going would be stronger than the desire to dissect the meaning of what is heard. In addition, the child may provide a response yet simultaneously store the new element, flagging it for future processing of its meaning.

Comprehension of Incongruous Information

There is a precedent for expecting such a facilitative strategy from research in domains other than language. For instance, Shepela and Boskey (1975) found that adults were likely to ignore conceptual incongruities in complex visual scenes and process the meaning of the scene as a whole. In a recognition paradigm, subjects reported having previously seen individual items in an immediately preceding scene. These were items which they had not actually seen but which fit in conceptually with the scene. In their chapter on comprehension, Bransford and McCarrell (1977) claim that

objects gain meaning as a result of interactions with other objects, including the perceiver, through their role in events. Rarely is an individual object perceived in isolation; perception usually involves relations between entities. Relational information can be in the form of physical properties. The physical forms are nonarbitrarily related to acts, interactions and functions that involve the object and its environment. For instance, different objects move across a surface in varying ways. The variations in movement of a baby, an adult, a toy truck, a snake and a rabbit are all related to differences in their physical structures. When confronted with a novel object, features of its physical structure can give the perceiver clues about the uses for or the functions of the object.

Perceptual information is richer than the characteristics of its individual components. In linguistic comprehension as well, the comprehender actively contributes to the process of comprehension. Bransford, Barclay, and Franks (1972) found that adult subjects "remembered" hearing the names of objects that in fact were not named, but were inferred on the basis of material they had heard. This line of research has demonstrated that the meaning of the whole may indeed be greater than the sum of its parts. Context effects may have a stronger influence than the individual elements in linguistic comprehension. Conversational behavior might reflect the same kind of

inferential process, even for young children. Alternatively, young children might use conscious strategies, such as requests for clarification (e.g., asking "What?"), to aid in making sense of incompletely comprehended utterances.

If a child behaves differently when confronted with nonsense in comparison to familiar material, what might that mean? Attention to the individual elements of an utterance on the part of the child might be expected to disrupt attention from the conversation as a whole. Conversely, it could be argued, that to stop and inquire about an unusual item could be a way of maintaining a meaningful interaction for the child. The child might be inquiring in an effort to fully understand what has been heard so that he or she could respond appropriately. However, by disrupting the flow, the child is momentarily suspending the conversation's general direction and curbing spontaneity. Thus the goals of lexical acquisition and comprehension and of conversational continuity appear to be temporarily in conflict. Because the young child is a relative novice in both linguistic domains, the conflict must somehow be resolved. It should be understood that the conflict is not necessarily at a conscious level. A young child may lack the requisite metaknowledge that he or she doesn't understand (Ann Brown, 1975).

In order to explore the potential conflict between the

goals of lexical acquisition and communication maintenance, research findings and theoretical issues from several areas in language development may be illuminating. Thus the topics to be discussed in the following sections will include: encounters with novel words and word-learning; pragmatic issues relevant to communicative continuity, such as coping with ambiguities, imitation, and question answering; and individual differences. Each of these areas is relevant to the issues of the present study. In the following sections, background about each area will provide the context and motivation for describing the research and for evaluating its results.

Novel Words

The focus of the present research is on children's encounters with novel words and not on the process of integration of the word into the children's vocabularies. However, some of the issues of lexical acquisition are relevant to the problem studied here. The following section reviews some of the relevant literature on the acquisition of new words. This background will provide a context for the research that is described below.

Carey (1978) discussed the process of acquiring the thousands of words typically learned in early childhood.

There are two sources of information available to the child for the purpose of adding a new word to his or her vocabulary. One is the linguistic context in which the word occurs, that is, the syntactic and semantic properties of the utterance in which it occurs. The other source is the situation of its use, or the nonverbal context of the utterance. The child brings his or her existing linguistic and conceptual knowledge to act on the incoming information to impose a meaningful order on it.

Carey and Bartlett, studied the acquisition of color terms (Carey 1978). They introduced a novel color term ("chromium", which referred to a shade of olive green) in a natural context to nursery school children. As part of an ongoing activity, children were asked to choose between two objects that differed in color only, either red or blue, and chromium. Each child was told, "Bring me the chromium tray, not the red one, the chromium one." One week later, the children were asked to match the color terms with the colors. They were asked, "Which one is the red one?", "Which one is the chromium one?" The authors considered the matching task to be a second learning experience. Several weeks later, the children underwent a production task for which they were asked to label various color chips. Eight out of 14 children, who had on a pretest called the olive chip green, showed confusion at this point. They said either that they could not recall the

name of the color or they used a different color term (one shown to be unstable on the pretest). From these and other findings, Carey concluded that the child first maps a new term onto an existing category domain (here, color terms). Subsequently the domain has to be reorganized to accommodate the new term.

Carey identified two stages of word learning. First, a fast mapping of the word to an existing conceptual scheme. In this stage, the child pins the word to some aspect of his or her knowledge, often after only a single experience with it. Second, with repeated exposures, the word becomes more fully elaborated into the lexical and conceptual systems.

If, in the presentation of novel words, we were to see a fast mapping response, how would we recognize it? A child, in quickly mapping the new word onto an existing structure, would be unfazed by the word, and would give a response that implied comprehension. The word would thus be dealt with temporarily, at a behavioral level, possibly awaiting further refinements with future encounters.

Contrasts in Word Learning

The study of the contrasts between the meanings of words bears on the research reported here. The Principle of

Contrast, as outlined by Eve Clark (1987) states that, in language, for any difference in form there is a difference in meaning. For instance, child may know the animal dog and also know that caribou is an animal word, without knowing which animal it denotes. According to the Principle of Contrast, the child should think that the word caribou stands for some animal other than a dog. The Contrast principle falls into the category of linguistic constraint theories (Nelson, 1987) for it serves to constrain the meaning of any new word encountered by contrasting it with the meanings of words that are already known.

According to the Principle of Contrast, children assume that different forms contrast in meaning. When faced with unknown words, children have associated them with unfamiliar objects (Dockrell, 1981; Vincent-Smith, Bricker, & Bricker, 1974; Golinkoff, Hirsh-Pasek, Lavallee, and Baduini, 1985). Heibeck and Markman (1987) replicated the Carey and Bartlett (1978) study described above in which fast mapping occurred in response to a novel color term ("chromium"). In addition to examining children's responses to color terms, Heibeck and Markman looked at the domains of shape and texture. Children in this study did demonstrate fast mapping in response to the new terms. One of the interesting findings was that children behaved as if they expected new words to refer to unfamiliar items, lending support to the Principle of Contrast.

Gathercole (1987) recently argued tht Contrast is an untenable theory. Based on re-examinations of studies about the acquisition of object words, relational, and superordinate terms, she demonstrated that the data fail to show that children automatically assume that words contrast in meaning. Although the present study was not specifically designed to test the validity of the Contrast position, the issue of whether children assume contrast does bear on the concerns of the present research. If children who are presented with novel words, say, as new names for familiar objects, are willing to accept the new terms as synonyms, that finding might be evidence against the Contrast position. Acceptance of the new terms would indicate that children recognize that there may be more than one term that appropriately refers to the same referent. Alternatively, if children do not accept the synonyms, the Contrast principle might provide one possible explanation for that result. An assumption that any two terms contrast in meaning might prevent children from being receptive to new names for a familiar item.

Additional Uses of Artificial Stimuli

The amount of previous exposure a child has had to a word must be controlled when studying lexical acquisition.

Researchers have invented artificial stimuli (such as "chromium") for this purpose in order to gain control over the input received, by ensuring that the child has had no previous experience with the terms.

Keith Nelson and John Bonvillian (1973) presented 18 month old children with novel objects used as referents for words that were unfamiliar to the children (e.g., canteen, pulley). Children in different conditions heard different numbers of exemplars. Maternal strategies for teaching novel labels were examined as well as the amount of time the children acted on the objects. It was found that the number of times the object was named by the mother had no effect on learning. However, the children whose mothers spoke frequently to their children and who encouraged labeling by the child had higher label production. These findings suggest that stylistic differences among the mothers may account for differences in children's learning styles. Extrapolation of these results would suggest that these stylistic variables may influence children's verbal patterns and be one of the factors that help shape the differences among children.

Nelson and Bonvillian (1978) subsequently used a similar technique with older children (two and a half years old). Nonsense words were used in addition to low frequency, unfamiliar English words. Children were able to learn a label after only one exemplar was named, but were

more likely to do so when more exemplars were named. Both comprehension and production were studied.

Nelson and Bonvillian's studies did attempt to control the children's experience with new words. However, the mothers were not explicitly told how many times to name an exemplar. Thus, the stylistic differences resulted in varying amounts of maternal labeling. Although these studies provided more control over input than would be possible in a purely observational type of study, having mothers present the stimuli to their children makes it difficult to untangle the respective contributions made by mother and child to the language learning situation. Maternal styles could vary in terms of the performance they elicit from children in the setting of the experiment. Holding the presenter of the stimulus constant permits more control over the input conditions.

Another problem with the Nelson and Bonvillian studies is the unnaturalness of the tasks employed to introduce words. The frequency of naming is not typical of the way parents introduce words (Schnur, 1983). The method of the present study employs artificial input, but an attempt is made to maintain a more natural setting.

Shipley, Smith and Gleitman (1969) suggested that children may have more sophistication about language organization than their spontaneous speech demonstrates. They studied 15-30 month old children's responses to a

variety of syntactic and semantic structures. Their aim was to find out about children's underlying knowledge at the point of telegraphic speech (Roger Brown 1973). They investigated this issue by studying whether a child notices syntactic and semantic anomalies which would suggest knowledge not obvious in speech. In addition, they wanted to observe children's approaches to novel material. Children were presented with commands that varied in structure and semantic content ("Throw ball," "Gor me the ball.")

Shipley et al. reasoned that since an 18 month old child encounters dozens of novel English words, he or she would not be likely to conclude that there is anything inherently peculiar about hearing unfamiliar words. All but one of the subjects in their study responded with a relevant response less often when the stimulus contained a nonsense word. The authors suggest that the unfamiliar material may have alienated the children in some way. It may have been distracting, confusing, or seemingly irrelevant to the youngsters. These factors may have led the children to turn off to the material, not to hear the content of the utterance and therefore to be unable to respond relevantly.

Word Learning: Nouns and Verbs

Word learning studies have concentrated on the acquisition of nouns or adjectives. These classes of words may be more accessible to scientific methods because they have referents which can be demonstrated more clearly than other types of words. For example, the color blue, a doll, or a big circle versus a small one, should all be fairly easy to demonstrate in an experimental setting. Illustrating a verb might prove more troublesome.

It may be the case that verbs are more difficult to acquire than nouns. Dedre Gentner (1978) cites numerous observational studies as evidence that nouns and verbs are acquired at different rates. In all the studies (e.g., Huttenlocher, 1974; Nelson, 1973; Greenfield & Smith, 1976; Goldin-Meadow, Seligman, and Gelman, 1976), verbs were acquired more slowly than nouns. Simple nouns, both common and proper, are more concrete in nature than verbs because they refer to people and objects. Simple nouns refer to physical objects, which makes their relationship to meaning fairly straightforward. Verbs, however, express relational meanings which may be based on abstract concepts and may thus be more difficult to comprehend. Unconstrained by the physical world, they may depend on more complex relationships. In Gentner's example of the verb give,

there is no single reliable referent (as there would be for a noun like Daddy). Instead, give can convey a number of relationships, for example, the act of changing possession, as well as the items involved in the transfer and the participants in the activity. These kinds of relationships cannot be perceived as readily as in the case of a noun.

Camarata and Leonard (1986) demonstrated that children 20 to 25 months more accurately produced the names for object words than for action words that were matched in terms of their consonant and syllable structure. They consider that action words exert greater processing demands because of their greater semantic complexity. In the present study, both object words and action words will be employed in order to detect any differences in children's responses to both classes of words both in meaningful and nonsense contexts.

The language development literature has dealt with children's encounters with novel words. However the focus of that research has not been an explication of children's spontaneous responses to unfamiliar words. Rather, the concern has been to trace the integration of that word into the child's productive vocabulary or comprehension. Thus, the methods employed have included repeated presentation of the referents for the word.

The present concern is not with tracing the inclusion of words into spoken or understood vocabulary. Instead,

the aim of the research is to freeze in time the moment of the initial encounter, and to describe what occurs. The spontaneous reactions will perhaps inform the other literature by identifying individual styles of encounters which may be relevant to the learning process.

Interactional Issues

Examination of discourse is essential to the study of language development because discourse provides the immediate context for a child's experience with language (Dore, 1979). Studies of discourse help illuminate the acquisition processes by providing direct behavioral evidence of learning in the form of verbal and nonverbal responses.

It has been demonstrated that by 19 months of age, children are sensitive to discourse contexts. At this age, they also make efforts to maintain discourse (Bloom, Rocissano, & Hood, 1976; Shatz, 1978). However, young children's abilities to maintain discourse are limited, and the devices they employ are not necessarily those used by adults. For instance, several investigators (Keenan, 1977; McTear, 1978) found that children gave a full repetition of a partner's utterance. The repetition acknowledged the original utterance, and appeared to serve as a

communicative speech act. Of course, an adult who responded in this manner would not be considered an adequate conversational partner!

According to Shatz (1983), by the age of two, children have a sense of their obligations in a conversational setting and to some degree they are able to tailor their responses to fit differing contexts. Sometimes their responses are formally correct although not semantically appropriate.

In the study reported here, interactional strategies will be examined in order to observe how children cope with a particular kind of communicative situation, an encounter with an utterance that includes a novel word.

Action responding

Shatz (1978) addresses the observation that young children are able to respond appropriately to utterances that far exceed their own productive language abilities. Rather than explaining this phenomenon as an example of a competence/performance distinction, that is, that performance deficiencies prevent children's production from matching their competence, she offers another explanation. Shatz claims that children's alleged comprehension results from a processing system that can

make use of contextual information and from specific, action-based heuristics young children employ in their encounters with language.

Shatz (1978) examined responses to utterances that had more than one interpretation. The sentences could be interpreted to be requests for information or for action ("Can you talk on the telephone?"). She predicted that the 19 to 34 month old respondents would produce a preponderance of action responses regardless of the intention of the speech and regardless of the sentence type. Shatz also predicted that with development would come a change to fewer action responses. Both predictions were supported. Shatz interpreted her results as suggesting that young children are strongly biased to give action responses to the language they hear in a communicative situation. Shatz (1983) cautions against overinterpreting children's seemingly appropriate response behaviors.

Imitation

Imitation is one of the possible responses that children may make to novel words. Intuitively, the case for imitation being facilitative of lexical acquisition appears to be straightforward. It may seem logical to

assume that a child hears a new word used by an adult, imitates it and then includes it in his or her repertoire. But the data on this phenomenon are more complex.

Several authors have noted differences in children's tendencies to imitate. Nelson (1973), for instance, found wide variation among 18 children in both elicited and unsolicited imitation between 18 and 24 months. Bloom, Hood, & Lightbown (1974), in their longitundinal study, found significant differences in the amount of imitation evidenced by their six subjects.

In a controlled study, Leonard & Kaplan (1977) presented eight children with four novel toys which were assigned four novel words for labels. The novel words were expressed in eight different declarative sentence structures. The authors noted all instances of the children's use of the four words and noted whether the use was imitative or spontaneous. Due to the low percentage of imitation of the experimental words, Leonard and Kaplan concluded that children did not appear to be using imitation as a means of acquiring new lexical items.

In a subsequent study, Leonard, Schwartz, Folger, Newhoff, and Wilcox (1979) studied the imitation of lexical items in several conditions. In a series of three experiments, nonsense words that referred to items that varied in informativeness and novelty were presented to children. The authors found that children were more likely

to imitate novel words that referred to unfamiliar referents than words that they already used. Leonard et al. consider that their data are evidence against the position that imitation is facilitative for the subsequent inclusion of new words into spontaneous speech. Rather than viewing imitation as an acquisition device, they consider that children employ imitation as a strategy in order to participate in a communicative situation when they lack an appropriate lexical item of their own. Interestingly, although the study was specifically designed to investigate lexical development, the authors conclude by adopting a pragmatic explanation. They suggest that children may imitate as a form of acknowledgment to a conversational partner.
However, they push this position further. They claim that imitations were used to do more than simply acknowledge because they found that imitations discriminated according to both the novelty and the informativeness of the referent. The sentences used in the Leonard et al. study always employed the target word in the sentence-~nd position. Also, their novel and familiar words were exclusively nouns. Thus, their conclusions are based on a very limited population of all possible utterances.

Other authors have also adopted pragmatic explanations for the role of imitation. In her review of theoretical and clinical issues in regard to imitation, Rees (1975)

concludes that it is in the development of communication skills, rather than the acquisition of linguistic structure that imitation is important. Specifically, she considers that children may resort to imitation as a way to take part in a communicative situation when they would otherwise be at a loss for a way to participate. Mayer & Valian (1977) offer a social-conversational hypothesis for explaining the role of imitation in which they consider that the function of imitation is to enable to the child to remain in the conversation, fulfilling conversational obligations.

Boskey and Nelson (1980) presented answerable and unanswerable questions to two year olds. The authors compared the behavior of two groups of children, imitators and non-imitators, as determined by their speech in a naturalistic situation. The imitators in this study exhibited a tendency to imitate in response to unanswerable questions, providing evidence for the hypothesis that imitation can serve a pragmatic function, as a placeholding device to be used when a child lacks an appropriate response.

The research that is reported here was designed in part to investigate imitation as a conversational phenomenon, using a controlled situation.

Answering questions

Questions make up a large proportion of the uttterances that adults address to young children (Blount, 1972; Broen, 1972; Tamir, 1980 This observation has led to investigations about children's behavior in reponse to questions. Very young children's ability to answer questions has been demonstrated in several studies. For example, Ervin-Tripp (1970) found that by 21 months, children can discriminate questions, and that for children between two and three years of age, the order of response difficulty for the various wh-questions could be predicted. Similarly, Steffenson (1978) studied the development of two children's responses to yes/no questions. Each child adopted a different response system, although Steffenson claims that the children did not understand the questioning process or the particles expressed.

In pragmatic terms, a question requires an answer. If, indeed, the adult's aim is to get the child to speak, a question is a useful tool. However, questions have been considered among the more abstract structures that young children confront (Steffenson, 1978) In the simplest question, the child must understand that there is an implied choice to make and that his or her choice is in regard to the relationship of the subject and the predicate

of the sentence. In addition, the child must comprehend a reasonable number of the lexical items in the sentence.

According to Horgan (1978), the manner in which a child answers questions can provide information about how that child processes input. Horgan gathered data from a child at 15 months and again at 19 months. Over a two day period, the child's responses to three types of questions and a comparison group of statements were studied. She was more likely to respond verbally after questions than after statements. In fact, she could discriminate between yes/no and wh-questions. The child was most likely to give a locative response when she heard a wh-question. Thus, Horgan reasoned, she was tuned in to the form of the question (although not necessarily to the particular wh-word).

In the Boskey & Nelson (1980) imitation study discussed above, the use of questions was examined exclusively. Of the nine imitators studied, five imitated a greater percentage of wh-questions than yes/no questions and four imitated a greater pecentage of yes/no than wh-questions in their naturalistic data. The present study therefore included both types of questions in order to explore further the dimension of question type. The present study employs similar methods, but the stimuli include a broader range of grammatical types and response behaviors.

In an experimental study, the use of questions as

stimuli creates a situation in which the onus is placed on the child to provide a response. In addition, a question-answer format provides a clear example of conversational turn-taking (Tamir, 1980). Given young children's knowledge about responding to questions, the use of questions was considered to be an appropriate and direct method for investigating the concerns of the present study.

Declaratives and Imperatives

Although questions might appear to be the most likely candidates for the elicitation of conversational phenomena, inspection of naturalistic data reveals an interesting pattern. Bloom, Rocissano & Hood (1976) report that the four children, ages 21-36 months, that they studied imitated more after nonquestions than after questions, even though the adults' questions increased over time. In addition, naturalistic data collected for the Boskey & Nelson (1980) study revealed that for eight of nine imitators, declaratives were imitated a greater percentage of the time than were questions.

The Shipley, Smith & Gleitman (1969) and the Shatz (1978) studies cited above dealt with children's responses to imperatives and demonstrated that examining response behavior following a command may result in the appearance

of greater comprehension than actually exists. In the present study, both declaratives and imperatives were included in order to examine their respective roles in conversational behavior, especially in contrast with responses to questions.

Individual Differences

One would expect that the way in which a child responds to ambiguiites in language might be predicted by other aspects of that child's language development. A child may be more predisposed to one sort of response than another. This predisposition may derive from a characterization or overall profile of the child as a language learner. For instance, a child who had a tendency to imitate might imitate more readily when confronted with an ambiguity (Boskey & Nelson, 1980).

Nelson (1973) studied individual differences in the development of vocabulary for 18 children, ages 11 months to 30 months. A central finding was the presence of individual differences in the types of words that these children learned. At one extreme were Referential children, those who first learned and used words that referred to objects (ball, car). The children at the other extreme, Expressive children, had vocabularies that

contained few object terms and many words that expressed their own desires (want, need) or aspects of social interaction (bye-bye). Although, by two years of age, the Referential children had significantly larger vocabularies, their MLUs were not higher. In forming early mult-iword sentences, Referential children tended to rely on nouns while Expressive children used pronouns more frequently.

Although the Referential/Expressive distinction represents a continuum rather than a dichotomy, it differentiates two very distinct styles for those children who are at either extreme. Whereas Referential children use language to refer to objects, Expressive children show more concern with social interaction.

This distinction bears on the problem studied here. For example, a child whose language is referential might be more tuned in to the individual words (especially nouns) heard, whereas an expressive language learner might be more concerned with the social dimension of the conversation and be more inclined to keep the keep the interaction going, glossing over incongruous elements. In any case, this dimension of individual differences was included in the design of the study to see if it offered any clues about variations in children's approaches to the material they encounter.

The Present Research

This research was designed to examine children's responses to novel utterances in the course of an interactive play situation. In a preliminary segment of the study, descriptive linguistic data were collected for each of the children to see if specific characteristics, alone or in combination, could predict interactional behavior. In order to observe young children's responses to novel words, nonsense words were embedded in sentences and presented in the course of play and conversation. A set of sentences that were identical except that they did not include the nonsense word, was also presented as a control. Besides these two categories of meaningfulness,several other variables were included in the design of the experiment. These included four different types of sentences, the inclusion of both nouns and verbs in the target position and the placement of the target word in the middle or the end of the sentences. These syntax variables were included in the design in order to explore their potential effects on responses. Children's responses to the sentences were recorded by the Experimenter as they occurred. The types of response behaviors coded included verbal, action, and a variety of pragmatic responses. The statistical analyses were designed to look at the effects that the presence of a nonsense word had on behavior as

well as the effects of the linguistic variables included in the design.

Research Questions

The research questions addressed in the present study are as follows:

1) How do children cope with novel material in the course of interactive play? The research examined behavioral responses to meaningful as well as anomalous utterances in order to see if variations in meaningfulness result in differences in comprehension and/or interactional behavior.

2) Are there descriptive linguistic characteristics that appear to predict children's conversational behavior? Several subject variables, including age, MLU, percent of imitation, and Referential-Expressive designation (measured by the ratio of nouns to nouns plus pronouns as described by Nelson, 1975) were analyzed to see if conversational behavior is related to other aspects of language sophistication. If a relationship is found it might suggest that communicative competence is a skill or set of skills influenced by linguistic maturity. That is, with

the development of other, standard language measures, we would expect to see corresponding changes in interactional behavior. Conversely, communicative competence might add a useful dimension to explorations of the various profiles of language learners.

3) What role do linguistic factors play in children's responses to conversational material? Four types of sentences (declarative, imperative, wh-questions, yes/no questions) were presented to the children in the course of conversation and play. In addition, the responses to novel words in the form of nouns versus verbs were studied, as well as the placement of the target word in the middle or at the end of an utterance. If these linguistic factors affect performance we would have additional evidence of young children's sensitivity to their linguistic environments. The relative importance of the factors included here may inform the domains of syntax, pragmatics, and semantics as the present study will examine different types of sentences and words, requiring different types of responses and under varying conditions of meaningfulness.

Methods

General Methods Considerations

The study was designed to examine children's responses to novel words. A child who encounters an unfamiliar word has several options. One, a child can gloss over the word and make a best guess about it based on the linguistic context in which the unknown word occurs. Two, he or she can signal that a new word has been recognized by asking about it specifically or by imitating it. Three, a child can "turn off" to the word by choosing not to respond to the stimulus, ignoring it.

In order to explore young children's responses to novel words, the subjects in the study were confronted with novel words embedded in sentences that were part of a play and conversational situation. Matched sentences, without the novel word, were presented in order to compare the responses to the two types of sentences.

Responses were coded as: appropriate verbal responses, appropriate nonverbal (action) responses, imitations, queries, conventional gestures, and irrelevant or nonresponses. These response categories were expected to reveal differences between familiar real words and nonsense words; word classes (nouns and verbs); and sentence types

(declaratives, questions, and imperatives), which served as independent variables in the design.

Table 1 presents the experimental design. The design included two conditions of meaningfulness. Two populations of target words, meaningful and nonsense, were embedded in sentences that were presented to children. There were four types of sentences, including declarative, imperative, yes/no questions, and wh-questions. The target words were placed in the middle or at the end of the sentences. Half of the target words were nouns and half were verbs. Four toys and actions that could be performed with the toys were the referents for the nouns and verbs that were employed as target words.

Overview

Twenty-four children served as respondents in this study. In a preliminary session, a language sample was obtained for each child. The corpus was analyzed for Mean Length of Utterance, Noun/Pronoun ratio and the percentage of imitation because these factors were considered to be potentially relevant to children's performance in the language task which followed. During a subsequent session, each child was presented with the experimental protocol which consisted of sentences that were either meaningful or

Table 1

Design of the Experiment

Sentence types:		Dec	Imp	Yes/no	Wh
MEANINGFUL	Noun Middle				
	Noun End				
	Verb Middle				
	Verb End				
NONSENSE	Noun Middle				
	Noun End				
	Verb Middle				
	Verb End				

Meaningful Nouns: BEAR, CAR, DRUM, HORN
Meaningful Verbs: HUG, DRIVE, BEAT, BLOW

Nonsense Nouns: PESS, NIPE, TOOP, DAKE, etc.
Nonsense Verbs: SIM, GORT, SEB, POTE, etc.

nonsensical. No specific instructions were given to the children, but the stimuli were presented in a natural, conversational tone as if they were part of the normal interaction which had evolved between the Experimenter and the children. Subjects' verbal and nonverbal responses to the sentences were recorded and analyzed in order to observe possible differential behavior in response to the two types of stimuli.

Pilot Data

The pilot sessions enabled the experimenter to develop a meaningful coding scheme, based on observed behavior. Two two year old children were presented with the experimental protocol. A video camera recorded the children as they proceeded through the protocol with the experimenter. Transcription of the video tape involved recording all of the children's responses. As a result, a taxonomy of responses was developed. Refinements of the taxonomy through synthesis led to the coding scheme that was used for on-line coding of the responses during the experimental sessions described below. In addition, the experimenter was able to identify and eliminate confusing words for the protocol (e.g., the nonsense word MIN was

perceived as "man" so it was replaced).

Subjects

The 24 children ranged in age from 20;26 to 29;00 months (the mean age in months and days = 24.19). Half of the subjects were girls and half were boys. The children came from middle or upper middle class homes in the New York City area. All of the parents had completed high school and all but one had a college education.

Subjects were recruited through personal contacts of participating parents. All parents were initially contacted by telephone. The experimenter explained the general nature of the study and told them that participation wouldinvolve two visits to the home. Parents were also told that their child would play with certain toys provided by the experimenter and that the visit would be recorded on audio tape.

A total of 28 parents agreed to their child's participation in the study. All of these children were visited at least once. In two cases, the children's speech was too immature to be included; they produced almost no recognizable words. In a third case, the child's speech, although plentiful, was unintelligible, and in a fourth

case, the mother was unable to make the necessary arrangements for a second visit.

Materials

The materials included: a pre-selected group of toys, a protocol of test sentences, and a specially designed picture book.

The four toys were chosen for their appropriateness to two year olds' development. Each toy had the potential to be manipulated easily and the designated name for each was a one-syllable word. The toys included: a red plastic CAR that could be propelled forward and backward across a floor or rug; a stuffed BEAR of plush material; a metal DRUM with a blue top and bottom and a bright design around the body; a plastic HORN that could be blown like a trumpet

Four one-syllable verbs (or actions) were selected to accompany each toy. Each of the actions could be performed by the children (and if not completely mastered, then at least attempted with understanding). The children learned to DRIVE the CAR, which consisted of pushing it; to HUG the BEAR by throwing one's arms around it; to BEAT the DRUM, by hitting the top of the drum with one's hand; and to BLOW

the HORN, by blowing into the mouthpiece and pressing the finger keys.

Other toys, such as a ball, a duck, a dog, a boat, and a hammer were brought to the children's homes as additional materials for maintaining an ongoing interaction.

The verbal stimuli consisted of two groups of sentences with 32 sentences in each group. The groups (A and B) were created as follows: For each toy (CAR, BEAR, DRUM, HORN) four meaningful sentences were written so that there was a sentence to represent each of the four sentence types: 1) declarative, 2) imperative, 3) wh-question, 4) yes/no question. For each action (DRIVE, HUG, BEAT, BLOW), there were four meaningful sentences, each of which represented one of the four sentence types. Thus, each of the four toys (nouns) and each of the four actions (verbs) appeared in sentences for a total of 32 meaningful sentences. Two groups were created out of the full set of sentences in case a child's attention was lapsing so that there would be a natural breaking point.

Next, a matching sentence was created by substituting a nonsense word for the target word (noun or verb) in the sentence. A total of 32 nonsense words were introduced in the course of the experiment. The nonsense words were one-syllable inventions (e.g., SIM, PESS, BLATE). Thus

there was a total of 64 sentences, half of them meaningful and half containing a nonsense element.

In order to counter-balance, in an equal number of sentences, the target nouns and verbs were placed at either the middle or the end of the sentence. Thus, for example, the declaratives that concerned nouns included "This CAR can go fast" and "I just bought this HORN." For declaratives containing verbs, there were such sentences as "I can BEAT on the floor" and "It's my turn to HUG."

Using a table of random numbers, each meaningful sentence was assigned to one of the two groups. Then the sentence's nonsense counterpart appeared in the alternate group. Within the groups, individual sentences were arranged in order to develop a context, so that two or three sentences in sequence might be concerned with the car. The context constraints helped preserve a natural conversational tone to the play session. The full set of sentences in the order that they were presented to the children appears in Appendix A.

Finally, a specially-designed picture book was included in the materials. It was designed to examine children's responses to text that was normal versus text containing nonsense. The storybook condition was originally included to provide a contrast between two types of interactions familiar to two year olds: conversation and play versus

listening to a storybook. However, because the task elicited very little responding, and led to no substantive conclusions, it will not be discussed further.

Procedure

The children were visited in their homes on two occasions by the female experimenter. The first visit served several purposes: to establish rapport between the subject and the experimenter, to obtain information about the child's language, to introduce the toys and actions which would be used in the experimental portion of the study, and to present the storybook-reading activity. The second visit was used to administer the experimental protocol.

During the first session the experimenter sat on the floor with the child in his or her bedroom or in the living room. She showed the child the collection of toys (see above) which included the four target toys as well as the extra toys. This was a free play situation with two important exceptions. First, the experimenter made certain that the child was introduced to the four target toys and the actions that accompanied the toys. She showed the

child each of the four toys and demonstrated the accompanying action (You BEAT the DRUM, You BLOW the HORN, You HUG the BEAR You DRIVE the CAR). Familiarity was measured in terms of comprehension (Give me the DRUM, Where is the BEAR?) although not in terms of production since production was not to be measured in the experimental portion of the study. The experimenter was satisfied that all children were familiar with the four toys and the four accompanying actions when the children demonstrated their understanding by choosing the proper toy or performing the correct action three times.

Second, the storybook task which was mentioned above was included during this session.

With the exception of these two conditions, the first session was primarily a "free play " situation in which conversation and specific play activities varied. The aim was to keep the interaction natural, so that the data collected would be reflective of the child's natural speech.

The session lasted one hour and was recorded on audio tape. At the end of the session, the child was told that the experimenter would return to visit with her toys.

The transcription of the tape recorded session provided a language sample for each child. Three aspects of the child's language were assessed: Mean Length of Utterance in

morphemes as specified by Roger Brown (1973); a Noun/Pronoun ratio (Nelson, 1975); and, the percentage of imitation (Bloom, Hood, & Lightbown, 1974). These measures were part of the data needed to explore the second research question, the role of particular subject variables in predicting interactional behavior.

In any study of a developmental phenomenon, the factor of age must be considered in order to examine maturational and experiential issues. Children who were approximately two years old served as subjects in the study because children at that age would be expected to possess the requisite skills for participation in the experiment, yet still show substantial variations in their performance.

Mean Length of Utterance (MLU) is a standard commonly used in studies of children's language. It may be viewed as a general index of syntactic maturity (Nelson, 1973). Although it does not provide qualitative information about the utterances, it offers a measure of comparison between children besed on how many morphemes typically occur in their utterances. In the current study the MLU was derived from the one hour language sample that was obtained on audio tape during the preliminary visit made by the experimenter to each of the children's homes.

Imitation was included as a variable in this study because previous research had shown imitation to be

employed as a strategy by some children to deal with anomalous questions (Boskey & Nelson, 1980). In the present study, the children's propensity to imitate was measured in terms of the percent of imitation in the naturalistic data that was obtained in the initial visit. It was calculated by determining what percentage of the utterances in the hour of taped interaction with the experimenter, was imitative. Imitation was defined as the repetition of part or all of an adults's utterance repeated within five utterances of the model.

The Referential/Expressive dimension, as discussed by Nelson (1973, 1975) was considered to be relevant to this study based on its potential for identifying how differential patterns of early language learning might lead to specific response strategies. In order to employ this measure, a ratio of nouns used by a child to the total amount of his or her nouns and pronouns was calculated. Thus, the children at the Referential end of the continuum had higher ratios because more of their utterances were comprised of nouns while the Expressive children's ratios were lower since there were fewer nouns and more pronouns in their utterances. Again, this analysis was based on the one hour language sample obtained in the first visit with the child

The second session took place one week later. This

session was structured to accommodate the experimental protocol. The 64 items of the protocol were administered in the same order to each of the children. After saying one of the items, the experimenter quickly noted the child's verbal and/or nonverbal response to it on a scoring sheet. An item was said one time only. Children were not corrected for a wrong response (such as handing the bear to the experimenter when the drum was requested).

The order of the protocol was such that two or three items which referred to the same toy were presented sequentially (see Appendix A). This sequencing was designed to serve as a context, so that unrelated items were not thrown haphazardly at the child. Before a sequence was begun, the target word(s) were deliberately not used in the conversation for at least three utterances. In addition, the relevant item was placed so as to be obviously the item under discussion.

Once the experimenter had the child's attention, she placed the relevant toy between the child and herself, then presented the first test item, and recorded the child's verbal and nonverbal responses to the test item. The second item was then presented, the responses recorded, and so on. The protocol was presented in the same order to all children.

The experimental portion of the study, as audio taped during testing, was reviewed and checked against the coding forms. The coding form (Appendix B) shows many more categories than were used in the analysis. The more fully elaborated categories were convenient for efficient coding as behaviors occurred. The categories were later collapsed for the purpose of the statistical analyses into seven response categories described as follows:

1. A Verbal Response included any relevant verbalization uttered by a child in response to one of the protocol sentences. The absolute correctness of the response was not considered crucial. Rather, the appropriateness or relevance was judged, based on the interactional context. For instance, if a child answered "red" when asked, "What color is the DRUM?" (it was blue), the response was considered canonical and was counted as appropriate. If the response was conversationally appropriate in terms of the topic under discussion, it fell into this category.

2. An Action included any one of the following behaviors performed with the object referred to in the test item: Took, grabbed, looked at, touched, pointed to, grasped, played with, etc.). For example, if the sentence given was

"I know how to GIRB," referring to driving the car, and in response, a child manipulated the car as if she were driving it, that was counted as an action response.

3. A Combined Verbal and Action Response was noted whenever a child combined a Verbal Response with an Action Response. The criteria for both of those types of responses were met in order for a response to fall into this category.

4. An Imitation included a child's utterance that contained part or all of an experimenter's model utterance, and which occurred within five utterances of the model. A change in intonation was accepted under this definition. For example, if the protocol sentence was "This BLATE can go fast" (referring to the car), and the child's response was "BLATE?", that was counted as an imitation.

5. A Query was a What?, Hm?, or Huh? uttered by a child following a test item.

6. A Did Not Respond was coded for responses in which a child ignored the test item, by continuing an activity he or she was already involved in, ran off, said something that was clearly irrelevant in response to the test item

("I want to see Mommy."), sang, or emitted sound play noises.

7. A Conventional Gesture was noted for gestures of communicative significance such as a nod, smile, shrug, or a shake of the head. This kind of response clearly indicated a child's desire to continue the interaction by acknowledging an utterance in this nonverbal, yet conversationally appropriate mode.

8. Lost Data were unintelligible utterances, skipped entries due to experimenter's omission.

Results

Subject Data

One of the first research questions for the present study concerned the role of several variables and their influence on performance in play and conversation. The specific variables were included because of their potential effects on the outcome variables.

Appendix C includes the subject data for each of the children in the study. Table 2 below presents the summary statistics for the variables that were investigated. The ages of the children in this study were from 20;26 to 29;00 months. Their MLUs ranged from 1.15 to 3.38 morphemes. The MLUs of the children in the Nelson (1973) study at two years of age ranged from 1.03 to 3.37, with a mean of 1.91. Thus, the range of the two samples was similar although the mean in the present sample was somewhat higher. In fact, the range of the present subjects was quite similar to the 1.0 to 3.78 reported by Roger Brown (in Olson, 1980) for 21 children who were 30 months of age, somewhat older than the present sample. The percentage of Imitation ranged from 1% to 19%. The relatively low mean can be contrasted with the mean of 20% for the six children in the Bloom et al. (1974) study whose imitation score was calculated the same way as in the present study. Finally,

the Noun/Pronoun ratios, reflecting the Referential/Expressive continuum, ranged from 34% to 93%. The mean that resulted was very close to the proportion of nouns (53%) used by the children in Nelson's (1975) study, although those subjects were slightly older (examined at 24 and 30 months).

Table 2

Statistics on Subject Variables

Variables	n	Mean	SD
Age	24	24.19 months	2.54
MLU	24	2.22 morphemes	.64
% Imitation	24	7.83%	4.85
Referential/Expressive	24	56.63%	15.66

A series of correlations was computed for the following variables: Age, MLU, Percent of Imitation, and Referential/Expressive. (Sex was not correlated with any the other variables, and, in fact, was not included in any further analyses.) Table 3 presents these correlations.

Table 3

Correlations of Subject Variables

	Age	MLU	Imit	Ref/Exp
Age		.73 ***	-.Ø5	-.51 **
MLU			-Ø.31 *	-Ø.66 ***
Imit				Ø.32 *
Ref/Exp				

* p = .Ø7 ** p = .ØØ5 *** p < .ØØ1

The factors of Age and MLU were strongly positively correlated. Older children were likely to have higher MLUs as would be expected. MLU and the Noun/prounoun ratio were strongly negatively correlated. Children with higher MLUs were likely to have lower Noun-pronoun ratios. The third strong correlation was a negative one between Age and Noun/pronoun ratio. Older children were likely to have lower Noun/pronoun ratios. Two other correlations approached significance. Imitation was correlated with Noun/pronoun ratio wherein children with high Noun/pronoun ratios also imitated often. Finally, MLU was negatively correlated with Imitation, as children with high MLUs

imitated less often.

These findings were consistent with the Nelson (1973, 1975) and Bloom, Lightbown, & Hood (1975) findings that generally pronoun use is associated with higher level language use. The pattern that emerged among the subjects in the present study was that slightly older children, with higher MLUs were likely to rely less on nouns and were not likely to imitate. Of course, the complementary profile was that slightly younger children, whose MLUs were lower, were more likely to be users of nouns and to use imitation in their speech.

The Outcome Variables: General Nature of Results

The relative distribution of all responses according to the designated response categories is shown in Table 4. From this table, it can be seen that over 50% of all responses were either Verbal, Action, or a Combined Verbal and Action. Pragmatic conversational responses, such as requests for clarification (queries), imitations, and gestures accounted for 15% of the responses. Somewhat over one-quarter of the total responses did not address the stimulus. Did not Respond replies included those in which the children either did not respond to the stimulus (e.g., ignored it, ran off to another room) and those in

Table 4

Distribution of Responses According to Categories

Response Categories	n	%
Verbal	301	20%
Action	432	28%
Combined Verbal and Action	128	8%
Query	95	6%
Imitation	70	5%
Conventional gestures	59	4%
Did Not Respond	436	28%
Lost data	15	under 1%
Total	1536	100%

which the children said something totally unrelated to the stimulus ("I want Mommy."). This finding was explored further and is described below in the section regarding supplemental analyses. In general, the children were likely to respond to the items in the protocol, almost two-thirds of the time giving an appropriate Verbal or Action response or one that indicated willingness to participate in the dialogue via pragmatic conversational devices.

Sentence Types

Each of the sentence types was examined to view the nature of the responses it elicited in the experiment. That is, how did children respond to each of the four types of sentences presented under the two conditions of meaningfulness in the experiment? Table 5 displays each sentence type broken down according to how many times each of the seven response categories was chosen in response. The declaratives and imperatives elicited larger proportions of Action responses and Did Not Responds, while the two types of questions tended to elicit a range of different responses.

Table 5

Distribution of Responses by Question Type and Meaningfulness

	Verb	Action	Comb	Query	Imit	Conv gest	DNR
Declarative							
M	21	67	6	11	13	8	63
N	21	65	10	15	7	10	62
Imperative							
M	21	60	15	12	7	0	76
N	18	78	17	17	10	8	43
Wh-Question							
M	42	50	24	7	7	6	45
N	55	30	26	16	10	5	56
Yes-no Question							
M	61	45	12	5	8	9	51
N	62	37	18	12	8	13	40

Note. M = Meaningful; N = Nonsense

Analyses of Variance

The original seven response categories were collapsed in order to provide a more meaningful level of analysis. Three categories were formed, representing three levels of conversational meaningfulness. The results reported in this section will concern these three categories. Level I, Meaningful Responses, included the Verbal, Action and Combined Verbal and Action responses (N = 861 responses), and was considered to describe the most advanced responses from the point of view of conversational sophistication. Level II, Pragmatic Responses, included those that demonstrated some awareness of appropriate interactional behavior but were not as direct (N = 224), including Imitation, Queries, and Conventional Gestures. Level III, Irrelevant Responses were those that did not address the stimulus or were unintelligible (N = 451).

Repeated Measures Within-Subject ANOVAs, with four factors (Meaningfulness, Sentence type, Word type and Position) were conducted for the three response levels. For the purposes of these analyses, Level III was comprised of the data from the original Did not Respond category. When appropriate, pairwise comparisons were made at the .Ø5 level of significance using the Fisher Least Significant Differences test (1949).

It should be noted that the data base for the analyses included 32 cells representing all the possible combinations of the four variables (e.g, A nonsense noun in the middle of a declarative sentence, a meaningful verb at the end of an imperative, etc). There were two exemplars of each of the cells. Thus, for any child the cell mean could be zero, one or two. In the tables below the cells represent the means for all children, and the maximum score for each cell is two.

The distribution of the three levels of response according to the four sentence types appears in Table 6.

Table 6

Distribution of Sentence Types According to Response Level

Response Levels	I Meaningful	II Pragmatic	III Irrelevant
Sentence types			
Declarative	.98	.33	.65
Imperative	1.Ø9	.28	.62
Wh-question	1.17	.28	.53
Yes-no question	1.22	.29	.47

Note. Maximum score = 2.

Level I: Meaningful Responses

Table 7 displays the data from the ANOVA for Meaningful Responses broken down according to the four variables.

For Meaningful Responses, the main effect for Sentence type was significant, $F(3,69) = 4.28$, $p < .008$. Although no specific pairwise comparison accounted for this result, examination of Table 7 indicates that overall, questions more frequently resulted in this type of response than did declaratives and imperatives, i.e., nonquestions. In fact, declaratives were the least likely of the four types of sentence to lead to a Meaningful Response.

The other significant results were as follows: Among the interactions, Sentence type X Meaningfulness was significant, $F(3,69) = 4.38$, $p = .007$ (See Table 8). For declaratives and imperatives, and yes/no questions, the means for Meaningful Responses were higher for nonsense than for meaningful, while for wh-questions, children more frequently gave a sophisticated reply to meaningful items, although this difference was not significant between any particular pair of means. In addition, Sentence type X Word type was significant, $F(3,69) = 3.02$, $p < .05$ (See Table 9), with yes/no question nouns significantly more likely than declarative verbs to lead to a Meaningful

Response. In addition, the three-way interaction of Sentence type X Meaningfulness X Word type was highly significant, $F(3,21) = 6.60$, $p < .002$ (See Table 10), with numerous pairs of means significantly different from each other.

These data indicate that, in general, for responses at the most sophisticated level of conversational behavior, the type of sentence presented was the most important factor. Questions rather than nonquestions were likely to lead to this level of response. In regard to the issue of meaningful versus nonsense items, more advanced responding was not affected by this factor; behavior was similar regardless of the meaningfulness of the sentence presented.

Level II: Pragmatic Responses

The most important result among the Pragmatic Responses was the significant main effect for Meaningfulness, $F(1,23) = 5.76$, $p = .02$ with nonsense items more likely than meaningful to lead to these responses (See Table 11).

Several of the two-way interactions were significant, including Sentence type X Word type, $F(3,69) = 5.05$, $p = .003$ (see Table 12). Although no specific pairwise comparisons apparently led to the results, declarative

Table 7

Summary Table for Level I Responses

	Dec	Imp	Wh	Yes-no	Mean
Meaningful					
Noun					
Middle	1.00	.79	1.54	1.46	1.22
End	.88	1.00	1.50	1.25	1.16
Total Noun	.98	.90	1.52	1.35	1.19
Verb					
Middle	.79	1.08	1.00	1.08	.99
End	1.17	1.12	1.21	1.12	1.16
Total Verb	.98	1.10	1.10	1.10	1.07
Total Meaningful	.98	1.00	1.31	1.23	1.13
Nonsense					
Noun					
Middle	1.21	1.08	.83	1.17	1.07
End	1.12	1.17	1.08	1.25	1.16
Total Noun	1.17	1.12	.96	1.21	1.12
Verb					
Middle	.83	1.21	1.29	1.12	1.12
End	.79	1.29	.92	1.33	1.08
Total Verb	.81	1.25	1.10	1.23	1.10
Total Nonsense	.99	1.19	1.03	1.22	1.11
Grand Total	.98	1.09	1.17	1.22	1.12

Note. Maximum score = 2.

Table 8
Means for Sentence Type X Meaningfulness for Level I Responses

Sentence types	Dec	Imper	Wh	Yes/no
Meaningfulness				
Meaningful	.98	1.00	1.31	1.23
Nonsense	.99	1.19	1.03	1.34

Note. Maximum score = 2.

Table 9

Means for Sentence Type X Word Type for Level I Responses

	Sentence types			
	Dec	Imper	Wh	Yes/no
Word types				
Noun	1.07	1.01	1.05	1.28
Verb	.90	1.77	1.10	1.17

Note. Maximum score = 2.

Table 10

Means for Sentence Type X Meaningfulness X Word Type for Level I Responses

Sentence types	Dec	Imp	Wh	Yes/no
Meaningful				
Noun	.98	.90	1.52	1.35
Verb	.98	1.10	1.10	1.10
Nonsense				
Noun	1.17	1.12	.96	1.21
Verb	.81	1.25	1.10	1.23

Note. Maximum score = 2.

verbs were more likely than nouns to lead to a Pragmatic Response, while for imperatives, the nouns more frequently resulted in this type of response. Sentence type X Position was significant, $F(3,69) = 5.05$, $p < .007$ (See Table 13), with no particular pairs of means significantly different. Finally, Meaningfulness X Word type was significant, $F(1, 23) = 5.12$, $p = .02$, (See Table 14). Although the means were not significantly different in the post hoc analysis, for both types of words, the nonsense category was more likely than meaningful to lead to a Pragmatic Response.

The data for Pragmatic Responses have implications for the role of meaningfulness in the study. These will be discussed below. In general, the pragmatic responses were more likely to occur following a nonsense item than a meaningful one.

Table 11

Summary Table for Level II Responses

	Dec	Imp	Wh	Yes/no	Mean
Meaningful					
Noun					
Middle	.12	.42	.21	.29	.26
End	.25	.17	.08	.21	.18
Total Noun	.19	.29	.15	.25	.22
Verb					
Middle	.46	.12	.29	.17	.26
End	.50	.08	.25	.29	.28
Total Verb	.48	.10	.27	.23	.27
Total Meaningful	.33	.20	.21	.24	.24
Nonsense					
Noun					
Middle	.21	.58	.38	.42	.40
End	.42	.42	.33	.29	.36
Total Noun	.31	.50	.35	.35	.38
Verb					
Middle	.29	.21	.21	.58	.32
End	.38	.21	.46	.08	.28
Total Verb	.33	.21	.33	.33	.30
Total Nonsense	.32	.35	.34	.34	.34
Grand Total	.33	.28	.28	.29	.29

Note. Maximum score = 2.

Table 12

Means for Sentence Type X Word Type for Level II Responses

Sentence types	Dec	Imp	Wh	Yes/no
Word types				
Noun	.25	.40	.35	.30
Verb	.41	.16	.30	.28

Note. Maximum score = 2.

Table 13

Means for Sentence Type X Position for Level II Responses

Sentence types	Dec	Imp	Wh	Yes/no
Position				
Middle	.27	.33	.27	.36
End	.38	.22	.28	.22

Note. Maximum score = 2.

Table 14

Means for Meaningfulness X Word Type for Level II Responses

	Noun	Verb
Meaningful	.22	.27
Nonsense	.38	.30

Note. maximum score = 2.

Level III: Irrelevant Responses

Irrelevant Responses resulted in two significant main effects and one which was nearly significant. Table 15 displays these data. Overall, Meaningful items were more likely to lead to a Level III response than did Nonsense, $F(1,23) = 4.23$, $p = .05$.

Sentence type had a significant main effect, $F(3,69) = 3.12$, $p = .03$. Overall, declaratives and imperatives were the most likely to lead to an Irrelevant Response.

The Word type main effect aproached significance, $F(1,23) = 3.51$, $p = .07$. Verbs as target words more frequently led to an Irrelevant Response than did nouns.

In addition, the following interactions were significant:

The Sentence type X Meaningfulness interaction was significant, $F(3,69) = 4.74$, $p < .005$, wherein the difference between meaningful imperatives and nonsense yes/no questions was significant at .05 (See Table 16). Children more frequently gave no response to the meaningful imperatives than to the nonsense yes/no questions.

Two of the three-way interactions were significant. One, Sentence type X Meaningfulness X Word type, $F(3,69) = 8.35$, $p = .0001$ (See Table 17). For this analysis there were numerous pairs that showed a significant pairwise difference, including meaningful declarative nouns versus nonsense imperative nouns.

Two, the Meaningfulness X Word type X Position interaction was significant, $F(1,23) = 12.23$, $p < .002$ (See Table 18). The pair which accounted for this result was the meaningful verb placed in the middle of the sentence versus the nonsense noun placed at the end. The meaningful verb placed at the middle position accounted for the higher mean in this case.

These data for the Irrelevant Responses indicate that children were more likely to disregard meaningful than nonsense items and more likely to ignore nonquestions than questions.

Table 15

Summary of Level III Responses

	Dec	Imp	Wh	yes-no	Mean
Meaningful					
Noun					
Middle	.75	.75	.25	.25	.50
End	.83	.83	.38	.54	.65
Total Noun	.79	.79	.31	.406	.57
Verb					
Middle	.75	.79	.71	.75	.75
End	.29	.79	.54	.58	.55
Total Verb	.52	.79	.62	.67	.65
Total Meaningful	.66	.79	.47	.53	.61
Nonsense					
Noun					
Middle	.58	.33	.75	.42	.52
End	.38	.42	.54	.42	.44
Total Noun	.48	.38	.65	.42	.48
Verb					
Middle	.83	.54	.50	.29	.54
End	.79	.50	.54	.54	.59
Total Verb	.81	.52	.52	.42	.57
Total Nonsense	.65	.45	.58	.42	.52
Grand Total	.65	.62	.53	.47	.57

Note. Maximum score = 2.

Table 16

Means for Sentence Type X Meaningfulness for Level III Responses

Sentence types	Meaningful	Nonsense
Dec	.66	.65
Imp	.79	.45
Wh	.47	.58
Yes/no	.53	.42

Note. Maximum score = 2.

Table 17

Means for Sentence Type X Meaningfulness X Word Type for Level III Responses

	Meaningful		Nonsense	
	Noun	Verb	Noun	Verb
Dec	.79	.52	.48	.81
Imp	.79	.79	.38	.52
Wh	.31	.62	.65	.52
Yes/no	.40	.67	.42	.42

Note, Maximum score = 2.

Table 18

Means for Meaningfulness X Word Type X Position for Level III Responses

		Meaningful	Nonsense
Noun			
	Middle	.5Ø	.53
	End	.65	.44
Verb			
	Middle	.75	.54
	End	.55	.59

Note. Maximum score = 2.

Summary of Major Results from Four-way ANOVAS

Children gave Meaningful Responses to a similar extent whether the target word was familiar or novel. They acted as if they understood the utterances, and replied appropriately. However, the type of sentence presented to the children led to varying results within this category, with questions more often than nonquestions leading to a Meaningful Response. The type of word presented played some role, but only in relation to the meaningfulness of the word and to the type of sentence in which it was embedded.

When Pragmatic Responses occurred, they were more likely to be the result of a novel than a familiar word.

There were some effects of the sentence type, position, and word type variables, but the strongest effect in this category was the tendency for nonsense rather than meaningful material to lead to a pragmatic reply.

Finally, an Irrelevant Response was more common following a meaningful than a nonsense target word. In addition, the type of sentence contributed to varying results, with declaratives and imperatives more often resulting in irrelevant replies than did questions. This finding is expected since questions would be more likely to require a response, consistent with the results from the Meaningful Response category. Also, verbs were more frequently disregarded than nouns.

Thus, in this study, the meaningfulness of an utterance did not affect the degree to which children responded in a sophisticated fashion; they behaved as if they understood both meaningful and nonsense utterances and responded appropriately. However, in some cases, when faced with an utterance not readily interpretable, children chose to keep the interaction going through the use of a pragmatic device. Children were not likely to ignore nonsense words; they tended to respond to them. Sentence type played a strong role for both the highest level responding and in children's ignoring the protocol. As would be expected, questions encouraged sophisticated responses. Imperatives

and declaratives were more likely to be ignored.

The Role of Subject Variables

In order to explore the research question concerning the role of the various subject variables in predicting interactional behavior, a final set of analyses was conducted with each of the subject variables as a between-subject factor. Initial correlations for the subject variables and the three levels of response showed that none of the subject variables was correlated with the three levels of response. Each subject variable, Age, Imitation, MLU, and Referential/Expressive, was used to group subjects so that the design of the analyses included the subject variables as between-group factors, with Meaningfulness, Sentence Type, Word Type and Position as within-group factors. This allowed for investigation of the effects of the various subject variables since the new groupings permitted contrasts to become apparent between children. For instance, performance could be compared for children with high MLUs versus those with low MLUs.

For Age, the sample of 24 children was divided into three groups of eight children. The youngest group ranged in age from approximately 2Ø to under 23 months, the middle group ranged from 23 to 25 months and the oldest group

ranged from 26 to 29 months. For MLU, the low MLU group had MLUs under two words (N = 12 children), while the high MLU group had MLUs that were two words or more (N = 12 children). For Imitation, the sample was divided approximately into halves, with the low Imitation group having 6% or less imitation in their original transcripts (N = 13), while the high group had 7% or more (N = 11). For the Referential/Expressive category, children whose noun/pronoun ratios were under 50% (N= 11) formed the low ratio group, i.e., the Expressive-oriented, while children whose ratios were 50% or higher (N= 13) composed the high ratio, or Referential group.

Level I

For Meaningful Responses, the Age factor resulted in significant interactions: Sentence type X Age, $F(6,63) = 2.39$, $p < .05$ (See Table 19). Although none of the pairs exceeded the critical difference needed to be significantly different at .05, for all sentence types except wh-questions, the children in the middle age group were most likely to give a sophisticated response.

Next, the Age X Sentence type X Meaningfulness X Word type interaction was significant, $F(6,63)$ 2.84, $p < .05$ (See Table 20), with several pairs of means that

represented all three variables accounting for this result.

The Age X Meaningfulness X Word type X Position interaction was significant, $F(2,21) = 6.63$, $p < .006$ (See Table 21). Several pairs of means were significantly different at .05, mainly because of the higher scores middle than younger children for this response level.

In addition, the MLU factor led to a significant finding, Sentence type X MLU, $F(3,66) = 3.45$, $p = .02$, although no specific pairs of means could account for this result. The only sentence type which showed a rise in Meaningful Responses with increased MLU was wh-questions (see Table 22).

The Imitation and Referential/Expressive factors had no effect on performance for this level of response.

Table 19

Means for Age X Sentence Type for Level I Responses

Age	Young	Middle	Old
Sentence types			
Dec	.88	1.08	1.00
Imp	1.02	1.28	1.12
Wh	.98	1.16	1.38
Yes/no	1.23	1.23	1.20

Note. Maximum score = 2.

Table 20

Means for Age X Sentence Type X Meaningfulness X Word Type for Level I Responses

Age	Young		Middle		Old	
	Noun	Verb	Noun	Verb	Noun	Verb
Meaningful						
Dec	.75	.88	1.12	.94	1.06	1.12
Imp	.88	.88	1.00	1.44	.81	1.00
Wh	1.31	1.12	1.58	.81	1.69	1.38
Y/n	1.38	1.19	1.25	1.25	1.44	.88
Nonsense						
Dec	1.25	.62	1.19	1.60	1.60	.75
Imp	1.06	1.25	1.25	1.44	1.06	1.06
Wh	.69	.81	1.00	1.25	1.19	1.50
Y/n	1.06	1.31	1.38	1.06	1.19	1.31

Note. Maximum score = 2.

Table 21

Means for Age X Meaningfulness X Word Type X Position for Level I Responses

Age	Young		Middle		Old	
	Middle	End	Middle	End	Middle	End
Meaningful						
Noun	1.00	1.16	1.41	1.06	1.25	1.25
Verb	.94	1.09	.91	1.31	1.19	1.06
Nonsense						
Noun	.97	1.03	1.00	1.41	1.25	1.00
Verb	1.00	.88	1.25	1.19	1.06	1.12

Note. Maximum score = 2.

Table 22

Means for MLU X Sentence Type for Level I Responses

	Low MLU	High MLU
Dec	1.01	.96
Imp	1.20	.99
Wh	1.06	1.41
Yes/no	1.21	1.24

Note. Maximum score = 2.

Level II

For Pragmatic Responses, the MLU X Meaningfulness X Position interaction was significant, $F(1,22) = 5.96$, $p = .02$. Table 23 displays the relevant data. Although no specific pairs of means were significantly different at .05, it appears that low MLU children were more likely to give a pragmatic response to nonsense words in the middle of sentences and high MLU children were more likely to do so with a nonsense word at the end.

There were no effects of the Age, Imitation or Referential/Expressive factors for this level of response.

Table 23

Means for MLU X Meaningfulness X Position for Level II Responses

	Low MLU	High MLU
Meaningful		
Middle	.23	.29
End	.24	.22
Nonsense		
Middle	.43	.29
End	.26	.38

Note. Maximum score = 2.

Level III

Irrelevant Responses led to several significant relationships. Age X Sentence type was significant, $F(6,63) = 2.35$, $p < .05$ (See Table 24), with no particular pairs responsible.

Age X Meaningfulness X Word type X Position was also significant, $F(2,21) = 5.70$, $p = .01$ (See Table 25). Here, there were several pairs that were significantly different.

Imitation appeared to have an effect on this category unlike the other two categories. Imitation X Sentence type X Meaningfulness X Position was significant, $F(3,66) = 3.63$, $p < .02$ (See Table 26).

Finally, MLU X Sentence type approached significance, $F(3,20) = 2.56$, $p = .06$ (See Table 27), in that high MLU children were more likely to ignore imperatives and low MLU children were more likely to ignore wh-questions.

Summary of Results Regarding Subject Variables

Overall, in this study, age and MLU were the subject variables that showed some effect on performance in the experiment. The children in the middle age group were

Table 24

Means for Age X Sentence Type for Level III Responses

	Young	Middle	Old
Dec	.59	.62	.73
Imp	.55	.45	.86
Wh	.59	.53	.45
Yes/no	.45	.36	.48

Note. Maximum score = 2.

Table 25

Means for Age X Meaningfulness X Word Type X Position for Level III

Age:	Young		Middle		Old	
Position	Middle	End	Middle	End	Middle	End
Meaningful						
Noun	.59	.66	.38	.59	.53	.69
Verb	.72	.56	.56	.38	.72	.72
Nonsense						
Noun	.44	.41	.50	.43	.62	.56
Verb	.44	.56	.38	.56	.81	.66

Note. Maximum score = 2.

Table 26

Means for Imitation X Sentence Type X Meaningfulness X Position for Level III Responses

	Low Imitation		High Imitation	
	Middle	End	Middle	End
Meaningful				
Dec	.65	.46	.86	.68
Imp	.89	.86	.65	.77
Wh	.54	.35	.41	.59
Yes/no	.42	.73	.59	.36
Nonsense				
Dec	.65	.65	.77	.50
Imp	.65	.42	.18	.50
Wh	.54	.50	.46	.59
Yes/no	.42	.39	.27	.59

Note. Maximum score = 2.

Table 27

Means for MLU X Sentence Type for Level III Responses

	Low MLU	High MLU
Dec	.66	.65
Imp	.55	.69
Wh	.61	.44
Yes/no	.42	.53

Note. Maximum score = 2.

likely to give a Meaningful Response whereas the oldest children were the most likely to ignore the material they heard. The high and low MLU groups of children differed in terms of their responses to questions and nonquestions. Whereas low MLU children were more likely to give a sophisticated response to nonquestions, high MLU children tended to give a Level I response to questions. Also, based on MLU, wh-questions were sensitive to differences on this measure.

Although some differences were found based on subject variables, it should be recalled that assignment to the various groups was based on rather small gradations, so interpretation of these results remains tentative.

Supplemental Analyses

Post hoc analysis of the Did not responds

In order to further explore the finding that over one quarter of the children's responses did not address the stimulus, a post hoc analysis was performed. From the original transcripts derived from the first visit with the children, a percentage of the number of utterances that were disregarded out of the total number of utterances addressed to the children was calculated for each child.

However, this analysis was considered to be only somewhat reliable because the audio tapes did not fully capture all aspects of the interaction. The original purpose of the transcripts was to provide a corpus of language for each child to use for standard linguistic measures (e.g., MLU, percentage of imitation), and only minimal context notations were made. Thus only when an utterance was definitely ignored, as in when the experimenter had to repeat it, was it considered in the analysis. Sometimes the transcripts provided enough information to reveal that a nonverbal response had occurred as in the following types of sequence:

E: Can you hug the bear?
E: Good.

In the above example, even though no verbal utterance was recorded for the child, it could be inferred from the transcript that the child had provided a response. The mean percentage (15.29%) calculated for the 24 subjects, roughly represented the number of times children tended to ignore an utterance of the experimenter in the course of more natural conversation. Perhaps the larger percentage of nonresponses (28%) in the course of the experiment reflects the children's experience of something unusual taking place. The continuing presence of novel words may have had an effect on general response behavior. Being

unable to count on comprehending the material, children may have "turned off" to some extent. Except for the inclusion of nonsense words in the experimental setting, the two contexts were designed to be similar to each other.

Subsequent usage of the novel words

If children heard the novel words, accepted them, and, in fact, used them or repeated them, we might have a clearer understanding of how the words were perceived. Thus, the number of times each of the children used one of the novel words was counted. In addition, the way in which children used the word was considered.

Thirteen of the 24 children used the novel words in subsequent utterances. Among this group representing just over half of the entire sample, most children repeated only one of the 32 novel words. Three children used two, three or four of the novel words, and two of the children used seven and nine words, respectively.

Fifteen of the words utilized were nouns and 19 were verbs, so no clear differences emerged between those two populations of words.

Generally, the novel words which were used appeared in the latter part of the protocol. So, possibly, those children who did employ the new words were more likely to do so as as they became increasingly accustomed to their occurrence.

Only one of the 13 children seemd to use words to request clarification, e.g, by asking "GIRB?" in response to the sentence "I know how to GIRB." Twelve of the children used the new words in a manner that indicated that they spontaneously accepted them, without need for further clarification. Thus, for example, in response to the sentence "I can COBE on the floor," one child replied "Could I COBE on the floor?" and after hearing "Show me how you TILK it now," one child said, "I just TILK it." These responses served to keep the discourse going.

Half of the children in this study, at least once, appeared to accept new words as synonyms during the course of the interaction. This finding argues against the Contrast pricnciple which claims that children assume contrasts in meaning.

Discussion

The goal of this study was to investigate how children respond when they encounter a new word in the course of conversation and play. The specific research questions concerned the nature of responses to meaningful versus nonsense material, the respective roles of descriptive linguistic characteristics of young children, and the contributions of specific linguistic context factors. Response behavior was assessed according to varying levels of conversational sophistication. The discussion below is organized according to the original three research questions that were posed in the Introduction to this study.

How Children Coped with New Words in the Course of Interaction

In order to explore children's reactions to novel words, two conditions of meaningfulness were included in this study. Matched sentences which contained two classes of target words, those that were known to be familiar to the children, and nonsense words, were included in the

protocol.

The general pattern of findings was that the strongest effect of meaningfulness could be seen for pragmatic conversational responses (15% of total responses). Children were more likely to respond in this manner after confronting nonsense than meaningful material. Meaningful items were more likely than nonsense to lead to no response, that is, to be ignored. Perhaps, in these cases, the lack of novelty led to children's not bothering to reply.

The role of meaningfulness may be as follows: When engaged in play and conversation, complete comprehension may not be required in order to maintain the interaction. Children tended to respond to the novel stimuli in an appropriate conversational mode. In general, the children tended to provide a relevant response, thus maintaining the flow of the interaction. They neither ignored the utterance nor did they specifically inquire about a novel word's meaning.

The finding that communication maintenance overrides inquiries regarding new words is relevant to issues in lexical development as well as communicative competence. It appears that young children have a strong inclination to participate in and maintain their role in interactions and

that even without full comprehension of some aspects of the conversational content, the desire to sustain the interaction persists. This finding is consistent with Shatz's (1983) conclusion that by the age to two, children possess a sense of their conversational obligations and that some of their responses, although formally correct, are not appropriate semantically.

Indeed, context effects, in this case, the interaction itself, may be said to exert a greater influence than the individual components of the interaction, e.g., the presence of novel words, as would be expected given the comprehension studies of Bransford et al. (1972, 1977). In terms of children's comprehension of new words, the present research suggests that researchers should be especially cautious about attributing comprehension based on response behavior. The present findings suggest, similar to Shatz (1978), that young children may not really understand as much as their behavior implies. Perhaps reluctant to specifically inquire about a particular word, other information provided by the context may be sufficient to allow the appearance of comprehension.

The pattern of more pragmatic responses following novel items, may be further evidence that children strive to keep up their end of the conversation. It might be argued that

a query (the most common type of pragmatic response) which acts as a request for clarification serves a comprehension-related function. However, the nature of the queries did not appear to be comprehension-related. For instance, children did not ask "What is a TOBE?" Rather, the requests for clarification came in the form of "What?" or "Huh?. They appeared to the experimenter to be attempts to ask "What was that remark you made? I didn't get it," instead of the more clearly comprehension-related "What did that word mean?" Thus the sense of the these pragmatic responses seemed to be one of communication maintenance. Although the pragmatic category was responsible for the smallest number of responses among the three categories, it was the only one of the three for which nonsense led to more responses than did meaningful material.

The finding of a higher mean for No Response due to meaningful rather than nonsense is contrary to the results from the Shipley, Smith, & Gleitman (1969) study. The children in the earlier study tended to "turn off" to material that they did not understand. The children in the present study did not "turn off" to novel items; they tended to respond to them. The present subjects were older and had higher MLUs than their counterparts in the Shipley

et al. study. It may be that disregarding the stimulus reflected a less mature type of response and that there is a shift with development, from ignoring to tackling a nonsense element.

Possibly, with development, responses to a novel conversational item may change as follows: first, ignoring it; second, attempting to guess its meaning from the context; and third, directly inquiring about it, as an adult might. Future research might explore these proposed stages by examining responses to novelty in a conversational setting with children at varying levels of development.

In addition, the finding of more frequent No Responses to meaningful items discounts the idea that disregarding the stimuli results from problems of comprehension. That is, when children in the present study did not respond to an item, it was probably not due to comprehension deficits as they were more likely to disregard familiar items.

The frequency of the Did not Respond category, which accounted for 28% of the total responses in the study, requires explanation. It may reflect children's normal response behavior, or it could be a reaction to the experimental setting. That is, in the course of normal dialogue, children may disregard a great deal of what they

hear, necessitating repetition on the part of adult co-conversationalists. In order to investigate the probable reason for the higher percentage of responses which ignored the stimulus, the original transcripts of the 24 children were examined to see if the children commonly ignored or disregarded the utterances addressed to them during the initial visit. All of the transcripts contained examples in which the experimenter said several utterances sequentially before (if ever) receiving a relevant verbal response. These accounted for a mean of slightly over 15% of all the children's utterances. (Probably any parent of a two year old could corroborate this finding!). Unlike adults who ordinarily assume responsibility in their conversations through turn-taking, children's conversational behavior appears to be somewhat less reliable. Holes in the conversation are fairly common.

It should be noted that the conversational setting of the present study was actually a "play" session. The choice of this setting was made in order to make the children comfortable in a familiar type of situation. However, although a play situation may have been an appropriate choice for young children, and supportive in terms of its familiarity, it may also have permitted more distractions by encouraging a playful atmosphere. Thus

children may have been somewhat less focused than they might have been in a more adult-like conversational interaction. That possibility aside, the benefits of the play setting outweigh the drawbacks, especially given the long periods of engagement it permitted, and for its relevance to the normal activities of two year old children.

In addition, it should be noted that the paradigm for this study varied from the Carey (1978) or Nelson and Bonvillian (1978) studies in terms of the stability of the referents of the new words presented. In the earlier research, the relationship between the new word and its referent was one-to-one; each new word referred to a novel item. In contrast, the present research examined a standard set of referents that were familiar to the children and were renamed in the course of the experiment. The present findings would therefore have implications for a word-learning skill such as acquisition of synonyms.

Some of the research on contrasts in word meaning suggests that children do not assume synonomy when hearing a novel word in the context of a familiar referent (e.g., Heibeck and Markman 1987). However, the behavior of the children in the present study indicated that children

accepted new words as referring to familiar objects and actions. The design of the present study provided support for the child's accepting the novel word as a synonym based on the nonlinguistic context, that is, the item to be discussed was placed by the experimenter in such a way as to be obviously the topic of the conversation. The design may therefore have included elements appropriate to a social convergence process (Adams & Bullock, 1986; Nelson, 1985; Nelson, 1987), in that the child's interpretation was guided by the experimenter toward a shared understanding of meaning.

What do the findings regarding children's reactions to nonsense words tell us about encounters with novel words? Although it might have been expected that the presence of a novel word would signal to the child the uniqueness of the sentence in which it was heard, that was not seen consistently in this experiment. For the largest category of response, representing the highest level of conversational behavior, the children responded in a similar manner to meaningful and to nonsense words. This finding is consistent with the first stage of Carey's (1978) fast mapping stage. In her scheme, children would be expected to connect a new word to some aspect of his or her knowledge, in some cases after only one experience with

the word. The children in this study tended to make a "best guess" attempt; generally they seemed to, temporarily, at least, pin the word to some meaningful context, and then proceed to respond to it within that context. Whether Carey's second stage of word learning, in which the word becomes more fully elaborated into both the lexical and conceptual systems, would have followed could not be tested in the design of the present study. The focus was on initial encounters with a novel word and not on tracing further assimilation of the word. It appears that the fast mapping description may fit the results of the present study, in which children tended to accept the nonsense word and react to it appropriately. The other alternative that was considered was that the novel word in some way would serve as a signal that something unusual had taken place. A difference in the two conditions of Meaningfulness would have been evidence for this hypothesis. Thus, for example, the results might have been closer to those of the Shipley, Smith and Gleitman (1969) study in which the authors demonstrated that the presence of a novel word led children to not make a relevant response. As suggested above, the somewhat older children in the present study may have been performing in a more advanced manner. Additionally, in the earlier study,

the use of two nonsense words in some of the stimuli (Gor ronta ball) would have added considerable difficulty to the task, and might help account for the varying findings.

The general finding that children tended to respond similarly to meaningful and nonsense material is interesting in terms of its implications for understanding young children's processing of information. Consistent with the Bransford et al. (1977) position that the meaning of the whole is greater than the influence of individual elements, children in the present study appeared to be using inferential processes to cope with the novel elements in the utterances they heard. Given the original aim to determine which of the conflicting goals of lexical acquisition and communication maintenance takes precedence, the present results suggest that maintaining the interaction is primary.

Specific Linguistic Characteristics of the Children and their Relationship to Interactional Behavior

The second research question addressed the issue of whether there are specific characteristics of young language learners that are related to conversational

behavior. The statistical analyses yielded some significant relationships among the subject variables. In this study, children with high MLUs tended to be older, to have lower Noun/pronoun ratios and to imitate less frequently. This profile is consistent with the noun to pronoun shifts identified by Katherine Nelson (1973, 1975, 1981) and by Lois Bloom and her colleagues (Bloom, 1973; Bloom, Lightbown, & Hood, 1975) wherein children's vocabularies shifted from nouns to pronominal forms with increased age and MLU.

In terms of the role that the subject variables played in performance in this study, age and MLU were seen to have some effect on behavior, although the effects were not consistent. The middle age group generally performed at a higher level than younger or older children. Perhaps the oldest children were bored or less inclined to bother with the more mundane material. In general, children with high MLUs performed in a more sophisticated manner as well, especially in regard to answering questions. Children with higher MLUs more frequently produced Meaningful Responses to questions. Perhaps children with higher MLUs were more willing to tackle questions, which are more demanding than nonquestions in terms of expected reply. Or, perhaps, they were simply more familiar with the convention of answering

questions.

Perhaps because the post hoc groups that were formed to examine subject contrasts were derived from a continuum of values rather than from distinct groups, the results are difficult to interpret. Future research should include discrete groups to more clearly define specific developmental issues.

Imitation

One of the variables that was examined, Imitation, was included because of its role in previous, related research (Boskey & Nelson, 1980). However, this factor was not significant in the present study, primarily because there was little imitative behavior among the present subjects. Imitation accounted for only five percent of the total responses in the experiment, making it the second least frequent response among all children. The differing imitation response results from the two studies can probably be explained without comparing the actual studies in terms of methods or materials. Out of the 24 children in the present study, only three imitated at least 15% of the utterances in the one hour language sample collected

during the preliminary visit. In the Boskey & Nelson (1980) study, half of the 18 children imitated 15% or more of the utterances that they heard. Additionally, it should be noted that the definition of imitation in the earlier study was a stricter one, counting only immediate imitations, in contrast to the present study which counted an imitation if it occurred within five utterances following the model. Thus no clear conclusions can be drawn about the role of imitation for strong imitators because the current sample did not provide an adequate test for that factor. Future research should include two distinct populations, imitators and non-imitators, to look more directly at the role of imitation for strong imitators. In the present sample, there was not sufficient imitation to thoroughly examine this issue.

The Role of Linguistic Factors in Children's Interactive Behavior

The specific linguistic variables which were examined in the present study were: Sentence type, type of target word and position of target word. All of these resulted in behavioral consequences. As expected, children's knowledge

of discourse conventions led them to respond differentially to material according to the type of sentence heard. Thus, for example, questions were more likely than nonquestions to result in verbal responses. This finding was expected given normal discourse requirements and expectations. As has been previously demonstrated (e.g., Ervin-Tripp, 1970), young children early become aware that a question requires an answer. The purpose of an imperative is to elicit a specific response. Generally, an imperative would be expected to lead to an activity (e.g., "Find the HORN for me"). Declaratives are less compelling in terms of the expectations for a response. A sentence like "This is a metal DRUM," would not necessarily suggest the need for a response.

The reactions to two types of target words, nouns versus verbs, also elicited some differential response behavior in this study. Target words that were nouns resulted in slightly more of the highest level responses than did those that were verbs. It may be that because verbs are generally more difficult for children to learn, as suggested by Gentner (1978), they present more of a challenge when a response is expected. The placement of the target words also appeared to have some effect on children's responses. Children's performance in relation

to these variables are discussed below according to the three levels of conversation sophistication.

Overall, for Meaningful Responses, as expected, questions were more likely than nonquestions to lead to these sophisticated replies. In fact, declaratives, the least likely of all sentence types to require a reply, least frequently led to sophisticated responses. The imperative, usually a request for action, appropriately led to nonverbal responses within this level of response.

The only sentence type for which there was a clear developmental progression, was wh-questions. Likelihood to respond to wh-questions in a sophisticated conversational fashion increased with age. In addition, children with higher MLUs more frequently responded to wh-questions than did lower MLU children. Wh-questions, harder to answer than yes/no questions, may be addressed more readily by children who are more verbal. They may be somewhat more familiar with these types of questions which are produced later than yes/no questions. Thus it appears that responses to wh-questions may be the most sensitive to development. In terms of comprehension and discourse requirements, they require the most advanced kind of response. A wh-question not only demands an answer, but that answer should be more complex than a simple

affirmation or negation. Both nouns and verbs, when placed in the middle of the sentence, tended to elicit fewer high level responses than when they were at the end. This may reflect a recency effect, wherein the item heard last is retained best in memory. Or, perhaps, as a heuristic, children are attuned to attend more closely to the end of sentences, somewhat like Slobin's (1971) observation that children pay attention to the ends of words. They may have experienced that the most important information can be gotten at the end of an utterance. Future research might examine maternal speech to determine if mothers' sentences are structured in this manner. Of course, when the entire sentence is heard, i.e., when the target word is placed at the end of a sentence, listeners have the advantage of the total context provided by the utterance. More sophisticated responding would thus be expected, as occurred here.

For the pragmatic responses, of all the four sentence types, declaratives were the most likely to lead to these responses. Declaratives, as discussed above, are the least likely type of sentence to require a reply. However, perhaps children attempted to respond to these in some fashion, simply to keep the interaction going. For both nouns and verbs, when the target word was embedded in the

sentence, children were more likely to respond pragmatically than when the target was at the end of the sentence. In contrast with the finding from the Meaningful Responses, the more difficult embedded, target was more likely to suggest providing a conversation-maintenance type of response.

Overall, the declaratives and imperatives were the most likely to lead to No response. Questions would be expected to be more compelling in terms of requiring a response.

In addition, verbs were more likely to lead to No response than were nouns, again suggesting that verbs may be generally more difficult for children to manage.

Redesigning the Study

In considering future, related research, several aspects of the study require adjustments. Future research might more closely examine the subject factors which appeared to make a difference in the present study, i.e., age and MLU and their relationship to interactional behavior. To explore the roles of these factors more directly, specific groups of children at two or three ages and at different levels of MLU would be compared in a

between-groups design. Looking at interactional behavior developmentally may provide evidence for the sequence of responding suggested above: ignoring, making a best guess, and then specifically inquiring about a novel word.

In addition to presenting renamings of the items presented to the children, future research might also examine what occurs when there is a one to one relationship between the words and their referents. In the present study, the experimenter placed an item in such a way that the child was likely to interpet it as the referent. However, the results of the Heibeck and Markman (1987) research indicated that young children expect new words to refer to new rather than familiar referents. Thus, some children may have been confused by the numerous renamings and the implied synonymy of the present design. Although some children did appear to accept the synonyms, as indicated by their use of the novel words, it would be interesting to compare children's performance in tasks involving renamings versus stable referents.

Finally, future research might explore the relationship of initial strategies of dealing with new words and the effect on more long term learning. Subject factors as well as other conditions, such as the linguistic and extra-linguistic contexts of the initial encounter may have

a predictable effect on future integration of the new word into a child's vocabulary.

Conclusions

In the present research, children in a conversational/play situation generally participated appropriately. Encountering new words did not noticeably affect the flow of activity. The context, provided by the sentences presented to the children as well as the toys provided by the Experimenter, appeared to be sufficient to enable the children to interpret the meaning of the utterances despite the presence of new words. Approximately half of the children actually verbalized at least one of the new words in subsequent utterances. Children's behavior appeared to reflect a desire to keep the interaction going. Children seemed very accepting of the situation presented to them, generally not indicating that they interpreted it as odd or abnormal. They seemed less inclined to try to interpret anything specific about the interaction; instead they appeared to be attempting to keep the play and conversation in progress.

Would the type of processing seen here be similar for older children? That is, would older children signal that

something unusual has occurred? How would that be manifested? At what point in development would a shift occur? And, why would the shift occur in terms of cognitive, social and linguistic factors? Perhaps for the young children in the present study, the considerable demands of learning language forced them to "choose" a strategy for coping with the task presented. More mature communicators might perform differently.

In regard to word learning, the results of the present study indicate that given a single exposure, a new word appears to be integrated within the context of its occurrence and not singled out for further investigation. New names for familiar objects and actions were readily accepted. Young children hear new words every day. Certainly, to take the approach of inquiring about each new word encountered would be a cumbersome way to interact. The present findings suggest that one way children may adapt to this situation is to make a "best guess" about the meaning of a word, based on the linguistic and nonlinguistic contexts, and then "get on with things."

Appendix A

The test sentences in the order they were presented to the children:

1. What do you do with the HORN?
2. Show me how you SIM (BLOW).
3. Does the DRUM belong to you?
4. SHow me how you BEAT.
5. Give the PESS to me.
6. I know how to DRIVE.
7. This BLATE can go fast.
8. This BEAR is very FRIENDLY.
9. Should I GORT (HUG) him?
10. Is this a blue NIPE (CAR)?
11. Show me how you DRIVE it now.
12. What color is the DRUM?
13. What can you SEB (BEAT) with your hand?
14. This is a metal DRUM.
15. Do you know how to POTE (BEAT)?
16. Is the HORN white?
17. When should I TEB (BLOW) on this?
18. Why is the BEAR on his back?
19. Do you know how to DRIVE to the store?
20. Give me the TOOP.
21. I just bought this DAKE (HORN).
22. It's hard to POY (BLOW) sometimes.
23. It's my turn to HUG.
24. Give me the MIP (Bear).
25. Where should we BOOL (DRIVE)?
26. Whose DUR (CAR) is this?
27. Who should I hug?
28. Do you like the DILK (BEAR)?
29. Now you HUG him a little.
30. Find the HEB (HORN) for me.
32. I can BEAT on the floor.
33. Find the HORN for me.
34. When should I BLOW on this?
35. Is the TOBE white?
36. It's hard to BLOW sometimes.
37. What can you BEAT with your hand?
38. Does the BINE (DRUM) belong to you?
39. Where should we DRIVE?
40. This CAR can go fast.

Sentences cont'd

41. Do you know how to CLATE (DRIVE) to the store?
42. This TRONE (BEAR) is very friendly.
43. Should I HUG him?
44. This is a metal HABE (DRUM).
45. D you know how to BEAT?
46. Give me the CAR.
47. I know how to GIRB (DRIVE).
48. Do you like the BEAR?
49. Who should I DITE (HUG)?
50. Why is the HOTE on his back?
51. Now you CLEET (HUG) him a little.
52. I just bought this HORN.
53. Do you use your mouth to GUP (LOW)?
54. Give the DRUM to me.
55. I can COBE (BEEAT) on the floor.
56. What color is the MIPE (DRUM)?
57. Show me how you MUN (BEAT).
58. Give me the BEAR.
59. It's my turn to MOKE (HUG).
60. Is this a blue NIPE (CAR)?
61. SHow me how you TILK (DRIVE) it now.
62. What do you do with the PITE (HORN)?
63. Show me how you BLOW.
64. Whose CAR is this?

Appendix B

The coding form that was used in the experiment

CHILD'S NAME:

(1)

PART ONE

SENTENCE	NR	ACTS AND	VERBAL: RESPONSE	VERBAL: IMITATION	VERBAL: UNINTELL	VERBAL: SOUND PLAY, NOISE	VERBAL: WORD	VERBAL: UNINT	NONVERBAL: TOUCH, GAZE PLAY	NONVERBAL: GAZED WITH	NONVERBAL: POINTED AT, TOUCHED	NONVERBAL: LOOKED AT	NONVERBAL: FACIAL	NONVERBAL: BODILY ACTION
① WHAT DO YOU DO WITH THE HORN?														
② SHOW ME HOW YOU SIM (BLOW)														
③ DOES THE DRUM BELONG TO YOU?														
④ SHOW ME HOW YOU BEAT														
⑤ GIVE (DRUM) THE PESS TO ME														
⑥ I KNOW HOW TO DRIVE.														
⑦ THIS (CAR) PAST CAN GO														
⑧ THIS BEAR IS VERY FRIENDLY														

(2)

SENTENCE	NR	ACT'G ANS	VERBAL: RESPONSE	IMITATION	UNINTELL	SOUND PLAY, NOISE	"WHAT?"	LAUGH	NONVERBAL: TOOK, GRAB, GET, PLAYED	POINTED AT, TOUCHED	LOOKED AT	FACIAL	IMAGE? ACTION
(9) SHOULD I GORT HIM? (HUG)													
(10) IS THIS A BLUE NIPE? (CAR)													
(11) SHOW ME HOW YOU DRIVE IT NOW.													
(12) WHAT COLOR IS THE DRUM?													
(13) WHAT CAN YOU SEB WITH YOUR HAND? (BEAT)													
(14) THIS IS A METAL DRUM.													
(15) DO YOU KNOW HOW TO POTE? (BEAT)													
(16) IS THE HORN WHITE?													

(3)

SENTENCE	NR	ACT+ANS	VERBAL						NONVERBAL				
			RESPONSE	IMITATION	UNINTELL.	SOUND/[illegible] NOISE	[illegible]	[illegible]	TOOK, GRAB [illegible]	POINTED AT, TOUCHED	LOOKED AT	FACIAL	IRREL. ACTION
(17) WHEN SHOULD I TEB ON THIS? (BLOW)													
(18) WHY IS THE BEAR ON HIS BACK?													
(14) DO YOU KNOW HOW TO DRIVE TO THE STORE?													
(20) GIVE (AIR) ME THE TOOP.													
(21) I JUST BOUGHT THIS DAKE. (HORN)													
(22) IT'S HARD TO POW SOMETIMES. (BLOW)													
(23) IT'S MY TURN TO HUG.													
(24) GIVE (BEAR) ME THE MIP													

	SENTENCE	DR	ACTGANS	VERBAL: RESPONSE	VERBAL: IMITATION	VERBAL: UNINTELL	VERBAL: SOUND/PLAY, NOISE	VERBAL: "HMM?"	VERBAL: LAUGH	NONVERBAL: TOUCH (GRABBED POINTED PUSHED HIT TOUCHED)	NONVERBAL: LOOKED AT	NONVERBAL: FACIAL	NONVERBAL: IRREL ACTION
(25)	WHERE SHOULD WE BOOL? (DRIVE)												
(26)	WHOSE DUR IS THIS? (CAR)												
(27)	WHO SHOULD I HUG?												
(28)	DO YOU (LIKE) THE DILK? (BEAR)												
(29)	NOW YOU HUG HIM A LITTLE.												
(30)	FIND (THE) MEB FOR ME. (HORN)												
(31)	DO YOU USE YOUR MOUTH TO BLOW?												
(32)	I CAW BEAT THE FLOOR.												
	END OF PART ONE												

PART TWO

	SENTENCE	NR	ACTG/ANS	VERBAL: RESPONSE	VERBAL: IMITATION	VERBAL: UNINTELL	VERBAL: SOUND/NOISE	VERBAL: PLAY, HUM?	VERBAL: UNREL	NONVERBAL: TOUCH, GRABBED, POINTED W/	NONVERBAL: POINTED AT, TOUCHED	NONVERBAL: LOOKED AT	NONVERBAL: FACIAL	NONVERBAL: IRREL ACTION
33	FIND ME. THE HORN FOR													
34	WHEN BLOW ON SHOULD IT THIS?													
35	IS WHITE? THE (HORN) TOBE													
36	IT's BLOW HARD TO SOMETIMES.													
37	WHAT BEAT CAN WITH YOU YOUR HANDS													
38	DOES (BELONG DRUM) THE BIKE TO YOU?													
39	WHERE SHOULD WE DRIVE?													
40	THIS CAR CAN GO FAST.													

(6)

SENTENCE	NR	ACTS & ANS	VERBAL: RESPONSE	IMITATION	UNINTELL.	SOUND PLAY NOISE	"WHAT?"	LAUGH	NONVERBAL: TOOK, GRABBED, PLAYED WITH	POINTED AT, TOUCHED	LOOKED AT	FACIAL	IRREL. ACTION
(41) DO YOU KNOW HOW TO KLATE TO THE STORE? (DRIVE)													
(42) THIS IRONE IS VERY FRIENDLY. (BEAR)													
(43) SHOULD I HUG HIM?													
(44) THIS IS A METAL HAISE. (DRUM)													
(45) DO YOU KNOW HOW TO BEAT?													
(46) GIVE ME THE CAR													
(47) I KNOW HOW TO GIRB. (DRIVE)													
(48) DO YOU LIKE THE BEAR?													

(7)

SENTENCE	NR	ACTGANS	VERBAL: RESPONSE	VERBAL: IMITATION	VERBAL: UNINTELL.	VERBAL: SOUND NOISE	VERBAL: [illegible]	VERBAL: LAUGH	NONVERBAL: [illegible]	NONVERBAL: POINTED AT/ TOUCHED	NONVERBAL: LOOKED AT	NONVERBAL: FACIAL	NONVERBAL: IGREL. ACTION
(49) WHO SHOULD I DITE? (HUG)													
(50) WHY IS THE HOTE ON HIS BACK? (BEAR)													
(51) NOW YOU CLEET HIM A LITTLE (HUG)													
(52) I JUST BOUGHT THIS HORN.													
(53) DO YOU USE YOUR MOUTH TO GUP? (BLOW)													
(54) GIVE THE DRUM TO ME													
(55) I CAN COBE ON THE FLOOR. (BEAT)													
(56) WHAT COLOR IS THE MIPE? (DRUM)													

(8)

SENTENCE	NR	ACT TRANS	VERBAL: RESPONSE	IMITATION	UNINTELL	SOUND PLAY NOISE	WHAT?	LAUGH	NONVERBAL: TOOK/GAVE OBJ. PLAYED W/	POINTED AT, TOUCHED	LOOKED AT	FACIAL	OTHER ACTION
(57) SHOW ME HOW YOU MUN (BEAT)													
(58) GIVE ME THE BEAR													
(59) IT'S MY TURN TO MOKE (HUG)													
(60) IS THIS A BLUE CAR?													
(61) SHOW ME HOW YOU LULK IT NOW. (DRIVE)													
(62) WHAT DO YOU DO WITH THE PITE? (HORN)													
(63) SHOW ME HOW YOU BLOW.													
(64) WHOSE CAR IS THIS?													

Appendix C

Subject data for all children

Name	Sex	Age	MLU	Imit	N/P ratio
Sarah	F	20;26	1.91	13%	65%
Gabriel	M	20;29	1.70	7%	69%
Ian	M	21;03	1.40	2%	68%
Cari	F	21;08	1.44	6%	84%
Regina	F	21;24	1.70	6%	45%
Mara	F	21;29	1.15	8%	93%
Stephen	M	22;13	2.07	6%	46%
Billy	M	22;20	1;69	17%	70%
Blythe	F	23;04	2.39	5%	52%
Ware	M	24;07	1.86	19%	81%
Zachary	M	24;11	1.63	12%	45%
Megan	F	24;17	1.91	4%	47%
Jessie	F	24;26	3.15	1%	41%
Simon	M	25;03	1.90	10%	69%
Kyle	F	25;16	2.96	5%	56%
Avi	M	25;19	1.91	9%	58%
Andre	M	26;14	3.38	3%	43%
Rebecca	F	26;14	2.30	12%	45%
Ben	M	26;17	3.16	6%	42%
Matthew	M	26;21	2.76	4%	47%
Lila	F	27;16	2.46	11%	52%
Allison	F	27;17	2.67	3%	34%
Lyra	F	28;03	3.00	15%	40%
Michael	M	29;00	2.78	4%	67%
Means		24;19	2.22	7.87	56%

Notes: Sex category refers to Male or Female; Age is in months and days; MLU is the mean length of utterance in morphemes; Imitation is the percentage of imitation in the naturalistic data sample; the Noun/pronoun ratio is the measure used to determine the referential/expressive dimension.

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