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City University of New York PH.D. 1983

THE UTILIZATION OF COMMUNICATIONAL CUES BY ONE- AND TWO-YEAR-OLD CHILDREN

by

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Abstract

THE UTILIZATION OF COMMUNICATIONAL CUES BY

ONE- AND TWO-YEAR-OLD CHILDREN

by

Rhianon Allen

Adviser: Professor Joseph Glick

The relationships between three models for describing pragmatic response to utterances were surveyed and the application of these models to young children's response patterns evaluated. Of particular interest was how children might discriminate action-directive and information-testing usage of language.

In order to empirically test the validity of these models, sixteen one- and two-year-old children were visited in their homes. Each child participated in two video recorded play sessions with an experimenter, during which he or she was asked complex What-questions that could take either informational or action responses. Gestural accompaniments and preceding discourse were systematically varied in Experiment I. Each child was also given the opportunity to respond to routine directive and testing speech forms. In Experiment II, the experimenter asked the What-questions while the child was looking at irrelevant toys and again while the child was looking at relevant pictures.

In Experiment I, children responded appropriately to the routine speech forms, but treated complex What-questions as ambiguous. Of special interest, children often responded with answers which combined

informational and directive interpretations.

Some aspects of context also affected responses to complex What-questions. The presence of a gesture prompted responses which tend towards nonverbal expression (orienting, acting). The toy activity in which a child was engaged affected the rate of action responding, but did not affect other aspects of response. The pragmatic function of the discourse preceding target questions had no effect on children's responses.

Two-year-olds gave more responses that combined or conflated action and informing, and gave more simultaneous response combinations, than did one-year-olds. Two-year-olds, but not one-year-olds, responded to the presence of a gesture by doubling their base rate of responses which contain both action and informing. The linguistic sophistication of the child appeared to be less strongly related to response than was chronological age.

These results indicate an early sensitivity to wording, and an increasing ability to integrate linguistic and nonlinguistic sources of information. Overall, the results support a model in which children are sensitive to both pragmatic structures and communicative cues.

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I. INTRODUCTION

In face-to-face discourse we often respond to conversational events in ways which indicate that we have gone beyond, or have fallen short of, the linguistic information inherent in the surface form of a particular conversational utterance. One of the ways in which literal form may be exceeded or bypassed is in the derivation of pragmatic function. It has been a main argument of pragmatics and speech act theory that utterances are used to do things in ways which very often cannot be directly reduced to the information contained in their vocabulary and grammar. For example, "Can you pass the pepper?" is literally an inquiry about one's capability. However, its pragmatic function is conventional in nature; it is commonly used and perceived as request to pass the pepper.

At the very least, by school age, a child would be wise to discern when a question such as "D'ya wanna try it?" should be taken as a sincere question, a directive, or a dare. A critical issue in the development of communicative skill, consequently, is how the child comes to understand what is meant when the utterance can have more than one pragmatic function. While it is acknowledged that at school age, most children's pragmatic knowledge is still limited in comparison to that of adults (Ackerman, 1978; Grimm, note 1), it has also been argued that children attempt to use their communicative systems in more than one way even from the very earliest stages of productive communication skill (Bates, 1976; Halliday, 1973, 1975). The specific

concern here will be with how very young children respond to questions which can take either of two very common pragmatic functions. It is these two functions--direction and testing--which underlie much of the child's early conversational environment. It is a valid question, therefore, to ask whether or not the child distinguishes between these two functions in speech directed to him or her, and how he or she distinguishes them.

There exist two main models of pragmatics from which one may draw hypotheses about pragmatic development, and one peripheral model which has received little in the way of systematic attention. These may be termed the structural, strategic, and cue utilization models; it is to these three models, and their unique theoretical concerns and predictions, that the remainder of this chapter is devoted.

The structural models

The primary motivation of structural models is the demonstration and classification of intentionality as displayed in speech. While structural models are primarily models of competence, they can be used to generate performance models which lend themselves to empirical verification.

In the course of structural analyses of ordinary language use, four classes of speech acts have been delineated. Although terminology varies somewhat, these four classes can be called the explicit, direct, conventional, and implied speech acts. Because the processing models differ somewhat for each of these speech act types, a brief description and explanation of these classes follows.

Historically, the explcit performative was the first to be

investigated. Austin (1975), in his 1955 Willian James Lectures, described situations in which a speaker accomplishes an act in a rather explicit manner. In such explicit performatives or speech acts, structural linguistic cues (wording, verb choice) carry critical information on the function of the utterance. For example, a speaker may say "I request that you pass me the salt". While certain conditions must still be fulfilled in order for the act to be successful and appropriate, the wording of such acts indexes the function of the utterance in an explicit manner.

The second class of speech acts, the direct act, has received little attention. These are cases in which wording generally serves as a direct, but not explicit, index of intent. A prime example is the imperative form, which is commonly used to convey a directive intent without explicitly stating the intent in the utterance itself (compare "Come here" with "I request that you come here"). Direct forms are generally utterances which do not include the explicit intention marker (e.g., "I order you to...", "I ask you..."). These abbreviated forms are much more common in everyday language use than explicit forms, which tend to be restricted to formal and ritualistic situations.

The third class of speech acts, examined most extensively in the philosophical literature by Searle (1975), can be called indirect-conventional speech acts. This class is comprised of utterances for which a decontexted structural analysis of wording would lead an investigator or responder to Function A, when in fact most native speaker-hearers would select Function A'. In these utterances, the

function is made neither explicit nor direct, yet a function is readily intended and conveyed, although in an indirect manner. A popular example is the utterance "Can you pass the salt?", when the utterance functions not as an inquiry, but as a request. Searle's accomplishment in the investigation of such speech acts was what amounted to a linguistic and philosophical 'proof' that these acts can express their functions indirectly by virtue of a structured coordination between linguistic meaning and the contextual conditions in which indirect meanings are commonly conveyed. Such indirect speech acts are conventional because they tend to be expressed in wordings commonly used to convey given indirects meanings (e.g., "Can you...?"). Searle's argument has been used as a blueprint for the construction of psychological processing models (e.g., Carrell, 1981; Clark & Lucy, 1975) in which a responder derives a literal meaning for an indirect speech act prior to transforming this meaning into a related, intended meaning. In such a model, indirect meanings can be computed by a hearer if they are expressed in conventional form (or a variant) with a structurally supportive setting.

The fourth class of speech acts rests on the assumption that, in addition to functional appropriateness conditions, all utterances must fulfill a set of conditions of face-to-face conversations, termed 'conversational postulates' (Grice, 1975). Implied-nonconventional speech acts, as the term itself implies, are utterances which are not explicit, direct, or conventional, yet for which functional assignments and derivations can be made within contexts of use. A typical example is "It's ten o'clock"—a simple informing response in the case of a

preceding request for information, but a directively-shaded warning to a child who is dawdling over a bedtime snack. It has been argued that, as with conventional indirectives, a hearer first derives a literal meaning and checks this functional meaning against the conditions of use. The original meaning is transformed through a logical process to obtain a derived function.

No matter which class of speech acts is under consideration, all structural models share four basic tenets: (1) the functions that speech serves can be classified into a small number of basic categories of speech acts, (2) the wording, or form and content, of an utterance indexes a literal meaning of that utterance which can be associated with a primary pragmatic force, (3) the context of an utterance can be characterized as fulfilling, or not fulfilling, a relatively small set of conditions which determine the appropriateness of this apparent primary force; these are generally termed 'felicity conditions'; and (4) respondants can, in perceiving a mismatch between primary force and the conditions of an utterance, engage in a process of inductive and deductive reasoning which eventuates in a secondary or derived force.

The first principle is not about to be challenged here. Speech does serve functions, whether or not active conversants consciously classify the acts in which they engage. The only point to be made here is that the two functions that will be investigated, testing and directing, belong to two different and discriminable categories of speech acts and should be maximally distinct to any native speaker-hearer.

There is little discussion in pragmatics of how the second tenet, the derivation of primary pragmatic meaning from wording, can be realized in psychological processes. That is, there is little understanding how a function can be assigned on the basis of syntactic and semantic information. While it is assumed that speakers can convey and hearers derive a functional speech act using wording as evidence, our notions of how this may be accomplished are somewhat vague. It seems unfortunate that a theory predicated on a native speaker-hearer's ability to utilize wording has not clarified the parameters and processes associated with this capacity. The capacity is taken largely as a matter of faith, although there is some verification of its existence in adults (Clark & Lucy, 1975) and school children (Carrell, 1981). As will be seen later, strategic models have directly challenged the utilization of wording in the derivation of pragmatic meaning. One of the issues addressed in the current research is whether young children who are still struggling towards an understanding of grammar give any evidence of using wording patterns for the derivation of a primary pragmatic force.

With regard to the third principle, the nature of the felicity conditions is best conveyed by outlining the conditions which define and confirm the two acts of directing and testing. The specific formulations are taken from Searle (1969, p. 66). A speech act is directive if and only if: (1) its propositional content is a potential act to be performed by the hearer, (2) the hearer is capable of executing that act, (3) the speaker believes that (2) is correct, (4) it is not obvious to speaker and hearer that the hearer would perform

the act without being directed to do so, (5) the speaker wants the hearer to perform the act, (6) the speaker has the authority to direct the hearer, and (7) the speaking of the utterance is an attempt to get the hearer to perform the act. The defining conditions of a test are different. An utterance is a test if and only if: (1) the speaker wants to know if the hearer possesses information, (2) it is not obvious to speaker and hearer that the hearer would volunteer that information without being asked, and (3) the speaking of the utterance is an attempt to elicit the information from the hearer. These lists are not exhaustive, but do impart the general flavour of felicity conditions. They are not discrete, concrete events. Instead, they involve relatively abstract notions such as intentionality, capability, and authority. Structural models are the only models which emphasize the role of formal contextual features in this manner. This feature has a corollary that contextual conditions that are not formal and abstract have no place in a model of pragmatic competence. This point will become important in constrasting structural theories with other available models.

The final tenet rests on the assertion that a competent speaker-hearer is able to convey and derive speech acts through utterance forms which are not direct and explicit. None of the three pragmatic models discussed here challenges this assertion. It is the hallmark of structural theory, however, that this is accomplished in a specifiable, step-wise manner: (1) a primary force is conveyed or derived, using the wording of an utterance, (2) this force is matched against the felicity conditions associated with that force, (3) if the primary

force and the conditions match or confirm each other, the primary force is considered accomplished, but (4) if they do not match, the exact nature of the disagreement or mismatch can be used to retrieve or construct the intended meaning. The entire enterprise rests on the structured interrelationship of wording, felicity conditions, and human logic.

To reiterate a point, most theorists holding to a standard structural model view themselves as engaged in linguistic-philosophical inquiry. Their concern is the elucidation of the structure of speech acts and the characterization of an internally coherent model of language competency. As with structural models of grammar and cognition, one can frequently observe a distinct aversion to the notion that actual performance may not follow the dictates of coherency, logic, and abstract principles. In pursuit of elegance, the strategic and cue utilization models argue, structural theory has failed to recognize the dynamic and richly textured nature of people attempting to communicate.

The structural model makes rather extensive demands in terms of linguistic and cognitive skills, both of which can be assumed to be in the process of development in young children. It remains somewhat unclear, then, whether a structural model is at all appropriate for children whose syntactic (Chomsky, 1969) and logical (Piaget, 1966) development is far from complete.

The strategic models

Strategic models argue that the application of a structural system to very young children is inappropriate on two counts. First, toddlers and preschoolers have too fragile a grasp of grammar for one to expect

them to utilize wording for the derivation of primary force. Secondly, the young child does not possess the inductive and deductive logical skills which would allow the derivation of a secondary or implied force, even if a primary interpretation could be derived.

In place of a structural system, the dominant strategic model (Shatz, 1978b) postulates that the child adapts sensori-motor heuristics developed during infancy as strategies for responding to speech. Since sensori-motor processes are heavily invested in direct action on objects, the deployment of such strategies results in the child responding to most speech as if it had a directive intent. Development away from this simple strategic system is viewed as gradual, and is not complete even by the fourth year. Over the course of the third year, the child learns through direct experience that direct action strategies do not always lead to acceptable responses and must be inhibited in many circumstances. The strategic model points to a set of contextual cues which may serve to inhibit the tendency to act in response to utterances. These are called stop-action markers. Preceding discourse and the absence of toys upon which to act are two cited examples of acquired stop-action markers. In the absence of such stop-action markers, children are still expected to revert to an action strategy for responding to speech.

In short, the main point of strategic models is that there is often little in the objective or logical conditions of a communication which directly predicts a response. Instead, the representative capacity of the responding organism is the prime determinant of response.

A strategic model is adept at explaining and predicting many aspects of actual performance in communicative settings. For example, it clarifies why children may have no difficulty in responding to mother's indirect wordings of directive forces (Shatz, 1978a). However, there are reasons for dissatisfaction with its scope. Shatz (1979) has voiced the concern that children may indeed use wording, although not in the way suggested by structural theory. Allen and Shatz (in press) have noted that the occurrence of action responses to some questions varies widely amongst 16 - to 18-month-olds. As best, a simple strategic theory may not capture the complexity of the one- and two-year-old communicative response system. Neither a structural nor a strategic model seem completely adequate to the description of young responders.

The cue utilization model

This model is based on the consideration that the majority of everyday utterances are ambiguous in some regard, but that a speaker will generally provide, and a hearer utilize, a variety of situational and linguistic cues which indicate how an utterance should be interpreted. The factors that influence response to language are not confined to simple psychological heuristics or to the structured linguistic and felicity conditions outlined by structural theory. While these latter may exert some influence on some responses, there are a number of factors outside the purview of structural and strategic theory which influence how the child or adult will respond to an utterance.

Historically, the model can be traced to Austin's (1975) stance on 'primitive devices' in direct speech acts. Austin described the

following as some of the factors which can affect interpretation: syntactic mood, tone of voice, grammatical particles, gestural accompaniments, and circumstances of utterance. It can readily been seen that these factors or devices are more concrete than the wording-function relation and felicity conditions associated with the structuralist model, functioning more like cues in a response cuing paradigm (Orne, 1981). These devices can be termed 'pro-force' markers.

The contrast with the structural model is best exemplifed by the differing stances on the role of wording in interpretation. Differing sharply from the structuralist model, the cuing model makes a distinction between routine (occasionally, 'idiomatic') and nonroutine forms. Routine forms are syntactic constructions that are sociolinguistically so closely tied to a particular function that meaning has become 'lexicalized' (Cole, 1974; Sadock, 1972; c.f. Panther, 1981). That is, in encountering such a form, respondants have an immediate perception of the intended meaning, and do not engage in the elaborate inferences invoked by the structuralist system. An adult participant may choose to conduct a structural analysis, but this is not generally the case for natural interaction, and is probably beyond the capacity of a small child under any circumstance. Lexicalization would be learned from concentrated exposure to form-function redundancies (Shatz, 1979), and evidence for the lexicalization effects of parental language routines has been presented by Allen and Shatz (in press).

Nonroutine, less common forms are those constructions whose wording does not directly carry a functional import. These forms are considered to be more ambiguous than routine forms, eliciting the

derivation of function through sensitivity to contextual cues. Responses to nonroutine forms, then, are expected to vary according to various aspects of context.

Now, what contexts? Allen and Shatz (in press) argue that gestural accompaniments of questions increase some kinds of nonverbally-expressed response, but do not affect vocal responses. There is evidence from other sources (e.g., Murphy & Messer, 1977) that children will orient to gestures, but that the gestural response system is not complete by late infancy. It would seem, then, that gesture is one aspect of context that affects response (however fortuitously in a structuralist's eye), but that its effect may be limited to nonverbal components of replies and that its role may change over age.

The toy and activity with which a question is associated may affect response, but the data are not entirely consistent here. Bruner and co-workers (Ninio & Bruner, 1978; Ratner & Bruner, 1978) have argued that some activities are developed by parents into scripted routines into which a child gradually learns to insert appropriate responses. Certain types of activities (e.g., book reading), then, should be used as cues for the production of functionally tailored responses. However, children do not always discriminate between picture and action toy activities in their responses (Allen & Shatz, in press). More research will be necessary in order to clarify the relationship between activity context and responses to questions.

There are certain affinites between the strategic and cue utilization models. Both are concerned with a characterization of actual performance in face-to-face interaction. Both argue that the linguistic

and cognitive demands of a structural model exceed the capacities of language-learners. In lieu of sophisticated analytic processes, children in interaction are considered to possess alternative means for governing their participation. The models concur that interaction systems must incorporate contextual cues to pragmatic force, and that these cues are learned in the context of parent-child discourse. The disagreement, therefore, is not on a philosophical or paradigmatic level.

The disagreement is over what the response system is. The strategic model formulates a system wherein the primary response impulse is towards action and development is the accumulation of stop-action markers. The cuing model proposes a system in which pro-force markers are gradually acquired, transformed, and integrated. In the strategic model, the child is constantly acting in response to language, unless he or she is confronted with evidence that this is inappropriate. In the cue utilization model, a conversational participant is perceived as constantly scanning for indicators of how a message should be taken.

Three models for the perception of pragmatic force

We have just surveyed three models for how a member of a speech community might be able to respond to conversation in ways which are not reducible to his or her grammatical understanding. The first model is structural in nature, with an emphasis on a linguistic/cognitive analysis of the utterance and certain aspects of its issuance. The second argues for the existence of a response strategy, with a gradual accretion of contextual and linguistic markers which

inhibit the deployment of this heuristic. The final model emphasizes early sensitivity to discrete pro-force markers, with continuing development and integration of functional cues.

These three models have been framed as competing theories of communication. But given that development occurs, it is possible that one model may be appropriate for communicative interaction at one age, while a different model may best characterize interaction at a further point in development. The question addressed here, then, is not which theory is the best pragmatic theory, but which model is appropriate for children in the age range of one to two years. Theoretical qualifications about the appropriateness of a structural model have been voiced above, and indeed some evidence has been presented against this model in the age range of one to three years (Shatz, 1978b). But similarly, the main proponent of a strategic model has remarked first of all that the action strategy may be partially outgrown by this period (Shatz, 1978b) or may not be applicable at all (Shatz, 1979). The problem with the cue utilization model is that although we may know more than Austin did when he wrote his treatise on pragmatics, we may still safely say that we have no theory about which objective conversational cues are linked to which pattern of assigned meaning.

In the following experiments, three sources of possible pragmatic variation are manipulated in an attempt to evaluate the applicability of the three response models to one-and two-year-old children. These are wording of stimulus utterance, context of stimulus utterance, and age/linguistic skill of responder.

For the manipulation of wording, children are presented with

three syntactic frames which are very common in parental speech (imperatives, "Can you...?", "What's this?") and one which is less common (complex What-questions). Each of the three models makes unique predictions of the dominant response to each utterance type.

In addition, the complex What-questions will be presented to children while a set of candidate contextual cues are varied. The contextual conditions are preceding discourse (directive, informative, neutral), gesture (points, no gesture) and toy activity (play with appropriate toys, play with question-irrelevant toys, looking at pictures).

The children who respond to these utterances are drawn from two different age groups: one and two years. These children are expected to manifest a range of expressive language skill. Thus, we may be able to determine the type of trajectory of any developmental changes in response pattern, and whether such changes are more closely related to age or linguistic skill.

Because some model predictions require knowledge of who the responders are, and what their pragmatic experience has been, there will be an attempt to characterize some aspects of these children's pragmatic environment (parental question usage) and their general communicative skill or linguistic status. For this reason, the presentation of specific hypotheses is postponed to Chapter III.

II. METHOD

This investigation consists of three separate methodologies--one experiment which manipulated minor contextual accompaniments and wording variations of messages within a naturalistic format, a second which varied the gross circumstances of target question presentation, and nonexperimental settings which afforded the collection of information on child language skill and parent-child communication.

Experiment I

Experiment I investigated the role of minor contextual cues in children's responses to What-questions presented in a semi-structured play session.

Subjects. Subjects were 16 children aged 17 to 28 months. The one-year-old group consisted of four boys and four girls of ages 17 to 21 months; the two-year-old group contained four boys and four girls aged 24-28 months. All children were from middle class families contacted on an individual basis. Two of the children in the younger group were first-borns, as were five of the children in the older group. The remaining children had between one and four older siblings at home. All families used English as the primary language in the home, although six children in the sample had had substantial exposure to a second language. The only language development criterion for entry in the study was that the child have at least five English words in the

productive lexicon--words which the mother could identify. Families were not reimbursed for participation.

Materials (toy sets). Three toy sets were used for the experimental sessions--a doll, house, and barn set. The doll set consisted of a rag doll with extra clothing. The clothing was intermediate in size between that normally required for the doll and that appropriate for a small child (i.e., baby clothes). These items were a hat, slippers, socks, and mittens. A toy truck large enough to seat a small child was included for some children; a small foam ball, a small tea set, and a small set of realistic plastic fruit were included for all children.

The house was a standard Fisher-Price doll house. The set of furniture and dolls which normally comes with the set, however, was reduced in number to avoid distraction. A small foam ball and a set of minature plastic fruit were included in the set.

The barn was a Fisher-Price barn and animal set. The set includes a tractor trailer, doll people, and fencing material. The set of people and the peripheral materials (e.g., horse harness) was reduced, again to avoid distraction. A small foam ball, a wooden tree, a small woolen bird, and minature plastic fruit were added to the set to expand the actions available to the child.

These toy sets were assembled so that children would have the opportunity to give appropriate action responses to all target questions asked during play. For example, embedding the question "What do you wear on your head?" in the doll set allows the child to respond by

trying to put on the hat from the set. At the same time, a sufficient variety of toys was included to ensure that a child had several distinctively different actions available at any given time. Order of toy set presentation was determined randomly for each child.

Materials (target questions). Target questions were What-questions with two to three basic semantic object-units. They were identified from pilot work as being used by mothers as direct test questions. However, they can also imply in a nonconventional manner that an action be performed. For example, "What do you do with a truck?" is directly used to elicit the verbal response "Drive" or "Ride", but children can interpret it as a request to play with the toy truck in an appropriate manner.

Table 1 presents the target questions used in both Experiment I and Experiment II. The question frames are presented with the lexical items which were substituted into them. Each child heard only two wordings of each frame, with the particular lexical items determined on a random basis for each child. In this way, a particular child heard two questions from each frame several times but he did not necessarily hear the same wordings as any other child. Questions were distributed evenly among the relevant toy sets and randomized, within certain sequencing constraits, for order of presentation. Constraints were that no more than two identical contextual conditions be allowed to follow each other, and that no more than two identical phrasings be allowed to follow each other. This constraint was formulated to avoid the clustering of cues in time. As an example, it was considered

Table 1

Target questions for Experiments I & II

1.	What	do you / does a dolly	wear on your/its	hands / head / feet	?
2.	What	lives / goes	in a	tree / house / barn	?
3.	What	does baby / does a cat / do you	do/eat		?
4.	What	do you / does dolly	do with a	banana / ball / car	?

necessary to avoid the succession of three or four directive settings in case the child construct a generalized expectancy for directive discourse.

Materials (nontarget events). With each toy set, each child was presented once with the following nontarget stimuli.

-"What's that?" accompained by point at object

-imperative form of a target question (e.g., "Put the bird in the tree")

-"Can you" form of a target question (e.g., "Can you eat the apple?")

On approximately half the occasions, the imperatives and "Can you" questions were accompained by a pointing gesture directed at one of the referents of the utterance.

All nontarget stimuli were randomized with target questions for placement within a toy set. Each child was asked to respond to 16 target wordings and three nontarget stimuli in each 15 minute toy set activity.

The "What's this?" stimuli determine how children respond to another direct test question. The last two events are a direct and a conventional directive, and hence should be responded to by action if children are attending to linguistic cues.

Experimental design. The two contextual conditions, preceding discourse and gesture, were factorially manipulated, yielding a split plot design. The general design is schematized in Table 2. Since each question was asked under all condition, eight responses per

Table 2

General design of Experiment I

Contextual Manipulations

	Directive Set		Informational Set		Neutral Set	
	Gesture	NoGest*	Gesture	NoGest*	Gesture	NoGest*
Younger Group (n=8)						
Older Group (n=8)						

*NoGest = questions were not accompanied by gestures.

condition type (i.e., eight target wordings) or 48 target data points in total were obtained for each child. Each nontarget stimulus, not represented in Table 2, was offered a total of three times for each child.

Discourse set is determined by a two-utterance sequence which precedes each target question. Both directive and informational sets exhibited some topic coherency with the target questions in that they concerned related members of the toy set without mentioning the actual toy indicated by the question itself. Directive discourse sets consisted of imperative frames aimed at involving child in action with the toys available. Informational sets were active declarative utterances aimed at involving the child in orienting to or talking about, but not touching, the toys. Examples of a target question preceded by its directive and informational sets follow:

Informational	All these clothes are for the dolly.
	She wears shoes and mittens.
	What does a dolly wear on her head?
Directive	Here, put the mittens on dolly.
	Now put on the socks.
	What does a dolly wear on her head?

The third discourse set was not a series, but the experimenter asked the target question after a pause of approximately one minute since the last utterance. This was termed the 'neutral' setting, although it should be cautioned that it is not so much a neutral as a 'child-determined' setting.

In order to study the effects of gestural accompaniments of questions, target questions were presented under two gestural conditions—gestured and no gesture. In the gestured condition, questions were asked while the experimenter pointed at the object whose name is the answer to the question (frames 1, 2, & 3) or the object of the question (frames 3 & 4). For an example of how preceding discourse and gesture combine, a child presented with a gestured directive question will hear:

Make the dolly sit.

Give her the apple.

What do you do with a banana? (E points to banana)

In the no gesture condition, questions were asked without accompanying gestures.

General procedure. Prior to the experiment, all children were visited in their homes by the experimenter. Mothers of subjects were informed that their children were to participate in a study of communicative development, and were given an estimate of how many visits the study should entail (2-3) and how long the average visit should last (1-1½ hours). They were asked to complete a language assessment scale, and a short mother-child play session was audio recorded (see below).

Up to two weeks later, the experimenter returned with video equipment and toys. The equipment was set up and left until the child felt at ease. As soon as the child began to ignore the equipment, the mother was asked to play or conduct some other normal activity (e.g., snack time, looking at books) of her own selection. After a five-

minute taping of this session, she was asked to sit back or alongside of the child while the experimenter played with and talked to the child. She was requested not to interrupt unless she felt the session should be terminated.

The experimenter then played and conversed as naturally as possible with the child, embedding the target sequences and nontarget events in filler conversation. The target sequences were timed so that they fell evenly among already instigated action activities, looking and talking activities, and pauses, regardless of the discourse set type. However, such timing was not rigidly controlled, as not all children evenly distributed their activities among these three basic possibilities. After all target questions for a toy set had been asked, the toys were replaced with the next set if the child was considered ready. A toy set was removed if the child ignored five consecutive target items, and tried again at a later point in time. The day's procedure was completed at the mother's suggestion or when the child appeared to be uncooperative and tired. Most children completed two toy sets in one half-hour sitting. A second day of testing was necessary for a majority of children. The same procedure was used on the second day, with a brief parent-child taping (when time allowed) followed by the experimental procedure. The overall structure of the Experiment I interactional setting was designed to mimic a normal adult-child play session as closely as possible. The general procedure, including Experiment II (see below), is outlined in Table 3.

There were a few variations from the outlined procedure. Two

Table 3

Outline of Procedure

Day 1	Day 2	Day 3
Familiarization with family (30 minutes)	Equipment set-up and waiting period (15-45 minutes)	Equipment set-up and waiting period (15-30 minutes)
Completion of REEL and lexicon count (30 minutes)	Parent-child activitity (video, 5-8 minutes)	Parent-child activity (video, 4 minutes)
Parent-child activity (audio, 15-25 minutes)	Experiment I, first two toy sets (video, 20-25 minutes)	Experiment I, remaining toy set (video, 10-15 minutes)
		Experiment II (video, 10-15 minutes)
		Debriefing interview (audio, 20-25 minutes)

There were a few variations from the outlined procedure. Two children in the older group completed the entire procedure on Day 2. For these children, the second video taped parent-child activity was deleted. A few children also completed Experiment I on Day 2. For these children, the video taped visit eliminated the second parent-child activity. Hence, a second recorded activity was obtained for only nine children. One two-year-old repeated part of an Experiment I toy set after Experiment II on Day 3, due to data missing from Day 2 collection.

Experiment II

Experiment II was designed to assess the impact of changes in the activity circumstances of target questions. The overall structure of the experiment was rather different from that of Experiment I in that the situation did not mimic a normal play session. Experiment I constituted a rather normal play activity in that a variety of toys was present, the child and experimenter engaged in normally-paced play-directed talk, and the questions asked of the child could be deemed to concern relevant toy-play and toy-talk. In contrast, Experiment II utilized only one or two toys at a time, was rather quickly-paced, and was planned to reduce the amount of preceding conversation. Experiment II was designed to highlight a contrast between orientation to a relevant picture and orientation to an irrelevant toy at the time a question is asked. Using this structure, several comparisons are afforded: overall circumstances (Experiment I vs. Experiment II), type of object in focal attention (pictures of

Experiment II vs. toys of Experiments I and II), relevance of question to object (toys of Experiment II vs. pictures of Experiment II and toys of Experiment I).

Subjects. The same subjects who participated in Experiment I were utilized for Experiment II.

Materials (toy set). Several small toy packages were constructed for use in the experiment. Each pack contained one or two small, simple action toys (e.g., small foam ball) and a sturdy picture taken from a baby book. The picture in each package illustrated in a very obvious way the answer to the target question associated with that package. For example, the picture for "What do you do with an apple?" depicted a small child eating an apple. In contrast, the toy in each package was not appropriate to the target question associated with it. However, the toy did provide the child with the opportunity to pantomime or act out an action appropriate to the question, using the toy as a prop. But in order to do so, the child would have to override the 'conventional' action potential of the toy. To extend the previous example, there was a small foam ball which the child could pretend to eat in place of an apple.

Materials (target questions). As with Experiment I, the target questions were generated from Table 1. Each child heard two wordings from each frame, but the lexical items were different from the specific lexical items that individual child heard in Experiment I. Each child therefore heard eight individual target wordings in Experiment II,

each associated with its own toy package.

General design. After eight toy packages had been selected for each child, these were randomized for order of presentation. In the course of Experiment II, each question was asked twice in conjunction with its package. It was asked once while the child was looking at the picture, and once while he or she was looking at the toy. These were called Pictures II and Toys II conditions respectively. The design resulted in 16 data points for each child, eight in each condition.

Procedure. In every case, Experiment II followed Experiment I (see Table 3), but for some children it occurred on a separate and final day of testing. The rationale for this relative placement was to avoid breaking the day-to-day appearance set for Experiment I.

At the beginning of Experiment II, each child was asked to "Come see what I have in this bag". The child was allowed to open the bag and remove the picture and/or toy. As soon as the child focused on one of the items, the question assigned to that package was asked. After attention had switched spontaneously to the other item, the question was repeated. When the question had been asked for both picture and toy, the items were replaced in the package and the child offered the next package in the series. The experimenter was instructed to present all questions without gestures and without preceding conversation. Experiment II generally required 15 minutes per child, and involved a rather quick progression from package to package (approximately one package every 2 minutes). In all cases, toys (T)

and pictures (P) were presented in a counterbalanced order of TPPTTPPT.... That is, if a child spontaneously removed a toy first for the initial package, he or she was next offered the picture, followed by the picture from the next package, and so on.

Parent and Child Baselines

Several sources of information were gathered on the communicational styles of parents, the questioning pattern of parents, and the linguistic capabilities and performance of the children involved in the sample.

Parental discourse. Three sources of data on parental discourse styles were obtained: audiotaped conversation, video taped play sessions, and a debriefing interview. The first two yielded data on actual usage and performance. The last yielded predominantly verbal self-reports of usage and the occasional datum pertaining to actual usage.

For the last 15-25 minutes of the first one-hour visit to the home, a portable cassette recorder was placed in the vicinity of parent and child, and the parent instructed to continue or shift to a parent-child activity of choice while the interaction was audio recorded for later analysis. This recording was later transcribed, and the parent's remarks coded for apparent pragmatic function, using Shatz's (1979) scheme. As only verbal information (wording and tone of voice) was available, only relatively unambiguous cases were coded for function. All parental remarks were subsequently classified as

questions or nonquestions by syntactic and intonational criteria. Questions were then identified as either What/Who-questions or other questions, (yes/no, other wh-). Ratios were computed for What-questions to questions, questions to utterances, and What-questions to utterances.

Parents were also video recorded in an activity of their choice with their children for five to eight minutes before the beginning of Experiment I. For a few children, an additional four minutes of video recorded interaction was obtained prior to Experiment II on the second day of video taping. Complete transcripts of verbal and nonverbal behavior were compiled from these recordings. Question-utterance ratios were computed as above. All What/Who-questions produced by a parent were identified from the transcript, their gestural accompaniments noted, and a pragmatic function assigned.

During the transcription of the final audio recorded debriefing interview, any child-directed remarks made by the parent were noted. From these remarks, an additional set of question-utterance ratios was computed. Discourse functions were assigned to all What-questions identified.

During the interview, each parent was asked several questions about his or her usage of questions, and of What-questions in particular. They were asked first what kinds of questions they thought that they normally asked their children, and about the activities that these questions accompanied. They were requested to report any routines or games which regularly accompanied their questions. If such information was not volunteered, they were asked if they were aware of using any of the target questions and, if so, whether the

questions commonly occurred in any games or routines. Parent's responses were transcribed and coded as self-reports of question usage. The full interview is presented in Appendix A.

The available transcripts of parent-child talk were thus used in the following manner: (1) to give an estimate of the frequency of What-questions in parental talk addressed to the child, (2) to determine whether children had had exposure to both testing and directive functions in discourse, (3) to determine whether children had had exposure to variants of the target questions used in the current experiments, (4) to identify the pragmatic functions carried by What-questions and variants of target forms in this sample, and (5) to identify any candidates for 'routine' What-questions among these mother-child dyads. The main purpose was to determine whether or not forms like the target questions were in fact used as direct test questions by the parents in this sample.

Child language measures. Several sources were used to estimate the linguistic capacities and skills of the children involved in the experiments. The parent-child transcripts described above were used for computing a mean length of utterance (MLU) in words and in morphemes for each child. Vocabulary counts were also computed from these transcripts, and expanded by asking the parents to list the contents of the child's productive lexicon. Parents were also asked specifically if their children were known to use the content words of the target questions and their canonical answers (e.g., "apple", "eat"); these words were added to the lexicon count if a parent

reported that the child used these words spontaneously.

On the first visit, parents and experimenter also completed the REEL, an age-graded scale based on parental reports and direct observations of both productive/expressive language use and comprehension/receptive skills (Bzoch & League, 1971). This results in an expressive and a receptive language age (in months) assigned to each child.

Parents were also asked, in the final visit, if they thought that their children understood each of the target questions, regardless of whether the child had responded correctly in the course of the experiments. These reports, in combination with a consideration of lexicon contents, were used to classify children into groups which could be expected to answer questions correctly or not.

The characterization of each child's linguistic skill therefore consisted of the following independent measures: (1) productive language skill as indexed by MLU, (2) productive language skill as indexed by expressive score on REEL, (3) receptive language skill as indexed by receptive score on REEL, and (4) question-specific skills as indexed in parental reports.

The Coding Scheme

The response code is concerned exclusively with the apparent function of the child's response. Theoretically, the function of a response is independent of form and content, although in practice there may be considerable overlap or redundancy. The primary functional distinction for the stimuli used here is that between action and informing—the child can make a response which indicates that he

perceived either a directive or an informational intent in the stimulus item and its presentation.

The aim of the code was to classify responses to all stimulus types (i.e., both targets and nontargets). Thus all responses to experimental stimuli were classified as belonging to the following functional types, according to their apparent pragmatic function. Interrater reliabilities are summarized in Table 4. All responses to Experiment I and II target questions, and to "What's this?" nontargets, emitted by one child from each age-sex group were coded independently by two raters (one of whom coded the remaining 12 children). Responses were originally classified by form and response channel (verbal, nonverbal, both), and collapsed into the categories listed below. Disagreements between raters were resolved by discussion and review of the videotaped response. Ambiguities in collapsing data into the functional categories outlined below were similarly resolved by reviewing the video record. The coding scheme is borrowed from Shatz (1978a), with the addition of the conflated and reference categories. As will be expanded below, the first four classes are considered appropriate or meaningful functional types for target questions.

(1) Simple informing—This indicates that the child perceived the event as requiring the designation of information. Predominantly, these are verbal responses, but may include nonverbal informing (indications such as pointing, showing). Also included are yes/no responses such as "I don't know", shrugs, and certain other kinds of verbal response (e.g., simple verbal deixis, verbal evasions) classified as simple informing if they indicated that the child seemed

Table 4

Interrater Reliability for the Coding Scheme

Category	Index			Significance		
	P_o	Kappa	P_e	s.e. o(k)	z	P
Presence of Response...	.921	.680	.756	.026	26.15	.0001
CHANNEL						
NVBL only.....	.891	.538	.766			
VBL only.....	.881	.578	.718			
Dual Channel....	.780	.556	.504			
Overall.....	.724	.565	.366	.038	14.87	.0001
NVBL TYPES						
Action.....	.868	.738	.497			
Orientation.....	.783	.584	.478			
Indication.....	.929	.489	.861			
Overall.....	.695	.537	.298	.087	6.17	.0001

NVBL = nonverbal modality

VBL = verbal modality

to believe that an informing answer was the appropriate response. Not all verbal remarks following a stimulus were counted as simple informing responses. Some remarks were simple accompaniments or postponements of action responses (e.g., "What does dolly eat?"—Child feeds doll and says "Yum-yum"), and hence were not coded as simple informing. Only informing responses without responsive nonverbal orientation or action were coded as 'simple informing'. Those verbal informing responses accompanied by orienting responses were classified as 'reference' (see below); those which occurred with an action were coded as 'conflated' (see below). A simple informing response is one which reflects a simple informational function without action or orientation components. It is the appropriate response to target questions by structural criteria.

(2) Reference—The child offers a verbal response which is judged to conform to an informational intent and that response is accompanied by a discrete orienting response to some object in such a manner that both the verbal and orientation components appear to be integral to the response. This category includes verbal imitations or unclear verbal remarks accompanied by orienting responses in cases where the child appears to be using the utterance to name or reference the object to which he or she orients. Since reference necessarily includes orienting to some object, it may indicate a perception that a a question is deictic in nature.

(3) Conflation—The response contains a conflation of action and informing. Here, 'conflation' is used in the linguistic sense to indicate that the child fuses two different responses in one response

slot. That is, the response contains both an action response and an informing component. The child appears to recognize that the question has both a directive and testing force. The two components need not be simultaneous, but both should follow the question quickly enough to be considered as true responses. Relative onsets of action and informing components were recorded.

(4) Simple action—generally, the response is nonverbal only, with the child performing some action which indicates that he or she perceived a directive force. The response may include an initial orientation if the action follows shortly; it may not include a verbal response which indicates that an informational force was also perceived. It may, however, be accompanied or indexed by a verbal response which supports an action interpretation (e.g., "What does dolly eat?"—Child says "Wait a minute. I hafta cook."). Simple action responses to targets are predicted by a strategic model.

The above four classes are standard response types. A cuing model considers all as functionally appropriate for target questions, given the pragmatic ambiguity of these questions. In contrast, they are not equally appropriate to nontarget stimuli. Only simple acting, for example, is appropriate for imperative stimuli. In addition to these standard types, there are three classes of responses which are not clearly appropriate. An outline of these responses is set out below.

(5) Simple orienting—The only response of the child is to shift visual orientation to some object, apparently in response to either question or gesture. In cases where the child had been oriented

towards the object concerned before the stimulus presentation, touching or picking up of that object is coded as simple orienting. Cases in which looking is established prior to the stimulus, and continues without change, is not coded as simple orienting (see ambiguous responses, below). The orienting response, in order to be counted as simple, is not extended by action, nonverbal indication or verbal response. Simple orientations, although not standard responses, were counted as 'codable' for some analyses, as they are considered as meaningful pragmatic responses in the cue utilization literature.

(6) Ignoring—The child offers no response whatsoever to the stimulus. On these occasions, the child was judged as giving no clear evidence of having heard an utterance or seen a gesture.

(7) Ambiguous—The response is too ambiguous in some way to count as a meaningful response. For example, a behavior occurred, but the coder felt that its status as a response to the question or gesture was highly uncertain and did not warrant inclusion as any of the above types. Another instance is when the behavior which occurred in the response slot was not sufficiently well articulated to allow unambiguous classification as a particular functional type. For example, the child appeared to perform some action, but his or her back to the camera blocked the coder's view and made accurate ascertainment impossible. The remaining ambiguous types were: an unintelligible verbal response without accompanying disambiguating behavior, visual search of toy space or room without discrete termination, verbal request for clarification which is not followed by further response, confused or blank look, staring or continued

nonresponsive orientation, and functionally inappropriate verbal or nonverbal behavior which nonetheless appeared to be provoked or elicited by the stimulus. Each of these particular subtypes was of very low frequency (3 to 20 cases of each type out of 768 target questions). All responses in this category reflect a lack of pragmatic clarity on the part of either the coder or the child. For some analyses, ambiguous responses were combined with ignorings into a class of 'noncodable response' due to (a) low frequencies and (b) lack of any theoretical distinction between these two types for a distributional analysis.

For some post hoc analyses involving target and nontarget stimuli, various codable categories can also be combined. Simple informing, reference and conflated responses can be combined to yield a general informational index—the overall propensity to offer an informational response component. Simple action and conflated responses can be combined for a general action index. A similar procedure has been employed by Clark (1979). In addition, reference and simple orientation responses can yield an index of general orientation.

III. TAILORING HYPOTHESES

Before any discussion of children's responses to experimental stimuli, it is necessary to consider the types of communicative experience these children have had, and their basic communicative skill as indexed by a variety of measures. This is especially the case since information about experience and skill is needed to state specific hypotheses relevant to the three models of communicative response. Hence, what follows is the specification of hypotheses for this sample of children.

While general expectancies about children's responses can be generated by the structural, strategic, and cue utilization models, these expectancies can be modified considerably by knowledge of the specific subject group which is offering the responses. There are two sources of information which will prove relevant to the fine tuning of hypotheses: parental language usage and child language level.

Parental Usage and Reports of What-Questions

A perusal of the available parent-child transcripts indicated that over half the sample of children has had substantial experience with the two discourse functions which the target questions could express. This does not necessarily indicate, however, that these children have had experience with What-questions or would be expected to associate What-questions with these two functions.

The corpus of parental speech to children totalled 4,082

utterances. Within the fixed 5-minute video session, a mean of 115.9 utterances was collected from each parent (SD = 36.26), or 23 utterances per minute. This talkativeness was manifest across a variety of activities of choice—from feeding the child to looking through books or albums. From the entire corpus of utterances, 563 What/Who-questions were identified, or 35.3 per parent (over approximately one hour of data collection). Variability in the frequency of What/Who-questions, however, was high (SD = 29.93). Over all transcripts, the proportion of questions to utterances was .39, with a range from .15 to .64 (SD = .13); the proportion of What/Who-questions to questions was .30, with a range of .10 to .54 (SD = .14); the proportion of What/Who questions to parental utterances was .12, range .02 to .25 (SD = .08). Because not all parents were video taped during the final visit, and because not all parents addressed speech to their children during the interview, it was not possible to statistically evaluate the effect of data source on these proportions. However, the proportions do not appear to change substantially across the four sequential sources. The questions/utterances proportions are .44, .34, .41, and .32 for the four successive situations. The What/questions proportions are .30, .29, .25, and .25; the What/utterances proportions are .13, .11, .10, and .17. In summary, the relative rates of What/Who-questions in particular and questions in general seem to reflect a phenomenon which is relatively stable across the observed conditions, but which shows moderate to high variability across parent-child dyads. While all children have had some exposure to What-questions, the extent of the exposure would seem to vary considerably. All ratios and talkativeness are higher

than those reported for Hardy-Brown, Plomin and DeFries's (1981) sample, and the questions/utterances ratio is higher than that reported for Lucariello and Nelson's (note 2) sample.

What/Who-questions were overwhelmingly used as test questions by all parents of older children ($\overline{X}$ = 70% of all What/Who-questions). Testing was also a common function of What/Who-questions for all parents of younger children, although at a significantly lower rate, $\overline{X}$ = 59%, t (14) = 5.00, p <.01. In contrast, parents rarely used What- and Who-questions to express the directive function, $\overline{X}$ = 2.1% of What/Who's. Parents appear to use the What-questions format as a direct test.

What-forms are not evenly distributed across syntactic subtypes. Over one-third of all What/Who-questions ($\overline{X}$ = 34%) were of the routine form "Who/What's this?". Variants of target questions accounted for 12% of all What/Who-forms. The remaining 54% of the What/Who-questions demonstrated no particular syntactic pattern, although some parents used a simple "What?" as a request for clarification.

Eleven of the sixteen parents were observed to use variants of one or more target frames. Most target variants were used as tests (37 of the 47 target variants). This indicates that these children, when they have had exposure to target forms, have had this exposure under conditions where they are expected to offer informational responses rather than action. As mentioned previously, this seems to be true of What-questions in general. Most parental target variants were in fact worded so as to preclude a test/directive ambiguity. Commonly, a variant was inflected as present progressive (e.g., "What are those

little tigers wearing on their heads?") or past tense (e.g., "What did you do?"). These grammatical inflections follow from situations wherein directive interpretations were unsupported in any case (e.g., looking through a book). However, at least two instances of each target frame were observed in functionally ambiguous wordings. Some samples of parental usage follow:

Frame 1—What do you wear on your head?

Frame 2—Who goes in the tractor?

Frame 3—What'd you do?

Frame 4—An' whaddaya do with the money?

In the 17 cases like those above, 11 of the questions were used as tests, 4 were used as directives and one was indeterminate for test/directive. The remaining case served as an attempt to elicit information not possessed by the parent.

Only two parents reported using a target form in a regular game or routine. A mother of a younger boy remarked "I say, you know, What goes here? ...with puzzle pieces." Her "What goes here ?" would be considered a variant of frame 2 as its surface form is functionally ambiguous (test/directive). A mother of an older girl offered as a common interaction "If we're involved in eating breakfast, I'll ask her What are you eating for breakfast? or What do you want for breakfast?." Although the precise wording of these target variants biases towards a testing and floor offer function, the response requirements are close to those of target frame 3. Eleven of the other parents reported nontarget What-question routines, predominantly "What's this?" quizzes. While most of the children thus appear to have had some

exposure to target forms, only two of the 16 are likely to have had any concentrated experience.

The relevance of parental usage

These results allow the fine-tuning of hypotheses about responses to target questions. Since parents use target forms as direct tests, structural theory would predict that children should offer informing responses to these forms when presented under felicitous conditions. That is, children should deal with targets as direct speech acts, and not as conventional or implied acts which warrant the computation of derived meaning(s).

The relevance of this pattern for the strategic model is not clear. Stop-action markers are learned from experience, and "What...?" has been suggested as such a marker. However, the parameters of stop-action learning have not been established, so it is not possible to state that the "What"-testing association should abort the action strategy. A strong stance would be that "What...?" is not such a marker, and should not prevent children from executing action responses to target questions.

The predictions of a cuing model rest on the distinction between routine and nonroutine forms. While they are direct tests, target forms were not used as conversational routines, except by two parents. For the group as a whole, then, a cuing model would not predict any consistent response pattern. Instead, a scatter of meaningful and nonmeaningful responses is expected, with a very slightly raised probability of informing-class responses. This should stand in strong

distinction to the reference responses predicted for the routine "What's this?" form.

The three models, then, make unique predictions about the dominant function of the responses to target forms, given information on parental usage. The structural model argues in favor of informing responses; the strategic model predicts a high proportion of action responses; the cue utilization model predicts a scatter of responses, with the possibility of a slight advantage to informing types of response.

Children's Linguistic Status

The children in this sample were assessed during the initial visit and subsequent parent-child interactions on three main language dimensions—receptive ability (RLA, or receptive language age on the REEL scale), general expressive ability (ELA, or expressive language age on the REEL scale), and utterance production (MLU in words and in morphemes). The two age groups differed significantly (ELA, t (14) = 2.79, p <.01; MLU in words, Mann-Whitney U = 9, p <.007) or marginally (RLA, t (14) = 1.61, .05< p <.10) on these measures. There were no sex differences on any measure, all t's (14) < 1, p <.10.

Table 5 presents the main linguistic skill indices for the 16 children in the sample. For the purpose of comparison with other samples, mean length of utterance (MLU) is presented in morphemes. MLU in morphemes averaged only .01 higher than MLU in words, indicating that the use of by-word calculation for subsequent analyses results in no systematic underestimation of these children's productions. The younger group of children ranged from Early to Late State I speech on

Table 5

Linguistic Skill Indices for Subjects

	Characteristics		Language Measures		
Subject	Sex[1]	Chronological Age[2]	MLU[3]	ELA[4]	RLA[5]
YOUNGER					
1.....	F	18	1.11	24	24
2.....	F	19	1.92	27	30
3.....	F	20	1.05	20	24
4.....	F	21	1.67	30	30
5.....	M	17	1.14	22	24
6.....	M	19	1.22	22	24
7.....	M	19	1.48	24	24
8.....	M	19	1.19	20	20
OLDER					
9.....	F	24	1.39	24	27
10.....	F	27	3.04	30	30
11.....	F	27	1.76	30	31
12.....	F	28	3.09	32	34
13.....	M	24	1.57	27	30
14.....	M	24	1.94	30	32
15.....	M	24	1.56	24	24
16.....	M	26	2.55	31	33

[1] F = female, M = male

[2] in months

[3] in words

[4] Expressive Language Age, in months

[5] Receptive Language Age, in months

the basis of MLU (in morphemes); children in the two-year-old group ranged from Early Stage I to Early Stage IV. Using a formula derived from a large sample (Miller, 1981), it can be noted that all boys in the sample fall within one standard deviation of the mean MLU (in morphemes) predicted for children from a middle class American population. Three girls (# 2, 10, and 12) had higher than predicted MLUs and can be considered slightly advanced; three girls (# 3, 9, and 11) had MLUs lower than predicted, and can be considered somewhat delayed in utterance production, although their general expressive skills (ELA) were age-appropriate.

The main measures of language ability utilized for comparison with experimental performance were the two REEL scales. Mean length of utterances is not logically associated with the ability to produce clearly formulated responses to target questions, although it might be expected to correlate with factors such as lexicon size and sentence comprehension which would be more directly associated with experimental performance. Hence, the REEL scales, with their solicited reports of lexicon size and comprehension, were used as the main language indices.

It should be noted that, while there are age group differences on all measures used, the two groups were not ideally separated in terms of language ability. In particular, two one-year-old girls (# 2 & 4) exceeded two two-year-old children (# 9 & 15) on all three measures. This cross-over allows exchange of these two pairs to form linguistic groups rather than age groups. The distinction between linguistic and age groups will be raised below.

In the debriefing interview, five parents of older group children

reported that their children understood all target forms well enough to supply an appropriate response. Only one child in the younger group, however, had a parent who expected that he could understand all target forms. Only two parents, both with children in the younger group, maintained that their children could not understand any of the targets as they were worded. The remaining seven parents argued that their children understood only some of the target questions. In general, then, parental reports indicate that the children fall across a range of linguistic skill, with no strong floor or ceiling effects for either age group and sufficient within-sample variability to allow post hoc comparisons and contrasts. The two age groups can be considered as moderately distinct in terms of communicative skill. However, the relationship between functional aspects of response and independent assessments of language skill have never been precisely delineated. Let us assume that, in a general sense, the difference between the two age groups represents a detectable difference in the ability to process the literal meaning of target forms. Such a difference would result in age-qualifications of hypotheses.

Relevance of language level

Since the ability to derive a primary function is a characteristic of a structural model, this model would predict an age-related increase in informing responses to target questions. In addition, nonmeaningful responses (ignoring, ambiguous responses) should fade with the advent of an understanding of grammatical aspects of communicative intent. Still, it is not entirely clear that a parent's report that a child

"understands the question as worded" signifies a level of understanding sufficient to derive a fully informed primary meaning. Until the relationship between grammar and direct speech acts has been more thoroughly elucidated, it is a conservative course to invoke the strategic model notion that the level of grammatical understanding displayed by two-year-olds may not be sufficient to warrant a structural model. In any case, the question has an empirical side. If two-year-olds give a very high proportion of informing responses, then it may be that they are using wording and that a structural model is a valid one for this age range. If they do not, then the model is not apporpriate for children of this age. The ultimate truth of a structural model is not in question here, only its validity for very young children.

The strategic and cue models are less concerned with linguistic skill, although they both qualify their hypotheses in the face of information about grammatical knowledge. A strategic model predicts minor increases in informing responses for more skilled (i.e., older) children, and increases in the effect of preceding discourse. A cue utilization model predicts increases in conflated responses—responses indicative of perceived ambiguity—with the growth of literal understanding.

These specific predictions, and the affirmation of such predictions, are not critical in the current investigation. The real import is framing the question which the following data address. For one- and two-year-old children with 'normal' communication development, which of the three models best describes responses to conversationally embedded questions?

Summary of Hypotheses

Given the general characteristics of the three response models, and information on the experience and language level of the subject group, specific hypotheses about children's behavior in the experimental setting can be constructed. There are four aspects of experiment which can be directly addressed: wording context, and age/linguistic skill.

Wording

Over the course of Experiment I, each child was presented with four alternative wordings of the same content. These were: (1) imperatives, (2) "Can you...?", (3) target What-questions, and (4) "What's this?". The three models make differential predictions about children's responses.

The predictions of the structural model reflect the formal classification of the contexted utterances: (1) imperative cases are direct directives, (2) "Can you...?" is a conventional directive, (3) targets are direct tests, and (4) "What's this?" is a direct testing question (see pp. 3-7). If it can be assumed that the children in this sample are in the process of mastering the match between wording and primary pragmatic meaning, then the following hypotheses can be constructed: (1) imperatives should receive only simple action responses, (2) "Can you...?" should receive both action and informing types of response, (3) target questions and "What's this?" should be answered only with informing responses, and the percentage should be close to identical.

The strategic model predicts little or no effect of wording for

children of this age range. According to this model, the dominant response to all stimuli should be the simple action response (see p. 9, cf. p. 10).

The cue utilization model, because it maintains that routine forms will be lexicalized and the nonroutine forms will be perceived as ambiguous, makes the following predictions: (1) imperatives and "Can you...?" will receive an identically high percentage of simple action responses as routine directives, (2) "What's this?" will receive almost exclusively informing responses as a routine testing question, and (3) responses to target questions will not conform to any other pattern of response, since these are not routine questions.

There may be responses to targets which contain both action and informing components. Such responses function as a special test case for the three models. In a structural system, such responses indicate that the classification of targets as direct tests has somehow gone awry, and that the questions have been mistakenly computed as implied forms (pp. 4-5). Still, the conflated response should preserve its natural history of an initial testing function, followed by a derived action interpretation. That is, the informing component should precede the action component.

The strategic model predicts the reverse. The informing component should follow the action response, as if it were an overlaid function or a mere confirmation of the action.

A cue utilization model, because it considers nonroutine forms as ambiguous, is tolerant of all kinds of directionality in conflated responses. If anything, true conflation, or simultaneous production of

action and informing components is favored as an index that the questions are indeed perceived as ambiguous.

Contextual Effects

The only contextual effects of concern to a structural model are those which determine whether a primary meaning is felicitous or not (pp. 6-7). Since all presentations of target questions were constructed so as to be felicitous with a testing interpretation, structural theory predicts no effect of the contextual variables (preceding discourse, gesture, toy type) manipulated here. That is, the structural model predicts that there will be no effect of these contextual aspects.

The strategic model, in contrast, anticipates some effects. If, and only if, the preceding discourse is successful in inducing an informing response to the discourse which is constructed to operate in this manner (i.e., informing discourse), then the preceding discourse should affect response (p. 9). Specifically, informing responses should follow informing discourse; action responses should follow directive and neutral discourse. This pattern is expected to strengthen over age. There are no predictions regarding the effects of gesture on response. There is a possibility of an effect of toy context. The absence of toys may function as a stop-action marker, thus decreasing action responses to the Pictures II condition. Hence, the presence of a toy effect on action responses would not be contradictory to a strategic approach.

The cue utilization model favors the modulation of response through contextual cuing. No specific prediction about preceding

discourse and target response can be made, however, because of the lack of empirical investigation into discourse cuing. There are, on the other hand, several effects anticipated for gestural cuing. Gesture is expected to be taken as a cue for nonverbal response (pp. 11-12). Hence, it should raise the probability of all responses which commonly contain nonverbal components—reference, conflation of action and informing, simple acting and simple orienting. As an attentional device also, it should reduce ignoring of target questions by ensuring an orientation response at minimum. Toy type should also affect response (p.12). Pictures II should be associated with an inflated rate of reference and simple informing responses. Note that this is somewhat different from the decrease in action responses suggested by the strategic model.

Age/linguistic skill effects

The three models can also be used to generate predictions of how responses to target forms should change across age or skill. Because the target questions are direct testing questions by a structural analysis, this model would predict that the dominant response should be the simple informing response. This response should strengthen with increasing age and grammatical knowledge, replacing responses which are not standard. Changes which are more closely related to linguistic level are in line with the structural model's emphasis on primary functional meaning (pp. 3-6).

If a strategic model is to be validated, children should give simple action responses to target questions. This pattern should be

somewhat stronger in the one-year-old group because it is less likely that they would have learned appropriate stop-action markers. One pattern would be expected to change with linguistic skill—any effect of informing discourse on attenuating action responses should increase with linguistic level since the ability to utilize discourse is assummed to be a linguistically-based skill (Shatz, 1978b).

The cue utilization model considers the target forms as ambiguous in function, and predicts a scatter across standard response types. As with the structural model, there is an anticipated decrease in ignoring and ambiguous responses between one and two years as children approach an adult discourse model. Simple orienting responses are also expected to decrease with age, as they are supplemented by informing and action components (p.13). In addition, it is expected that the pragmatic system becomes differentiated with age, with responses becoming more closely tuned to contextual cues. Linguistically-based cues (preceding discourse) would be associated with increases in linguistic skill, whereas nonlinguistic cues (gesture, toy type) would be associated with age-based experiential changes.

As previously mentioned, there may indeed be no effects of age or linguistic status, as there are no a priori grounds for determining the minimum separation for establishing such effects. The absence of any of the above effects, therefore, cannot disconfirm any of the models. On the other hand, the observation of effects can lend preferential support to one of the theories.

Thus, the three response models make differential predictions on four counts: the effect or wording on response, the effect of context

on responses to targets, and age/linguistic effects on response. Evidence pertaining to the three models will be presented according to each of these areas in turn.

IV. RESULTS

Responses can be viewed as varying with the wording of a speech act, its contextual embedding, or with the age and skill of its producer. The actual effects of each of these factors are presented below in light of the three response models being entertained.

The Effect of Wording on Response

Each child was presented with three types of nontarget utterance in addition to the complex What-questions which formed the main corpus of stimuli. These nontarget forms were scheduled not as statistical controls, but for descriptive purposes.

Table 6 shows the distribution of functional response types across wordings. This table indicates that functional response type is not independent of wording. That is, wording does appear to affect response. However, the pattern of response is as critical as the existence of an effect.

The pattern does not strongly support the structural model. "Can you...?" wordings receive no greater number of conflated responses than do the direct imperatives, t (14) = 1.14 $p > .10$. Nor are the frequencies of any informing type raised in response to these indirect but conventional forms. While the prediction that targets and "What's this?" questions should receive more informing types is borne out, it would appear that target forms receive far more action class responses than most structural models would find tolerable.

Table 6

Distribution of Functional Response Types across Target and Nontarget Stimuli, Experiment I

Response Type	Stimulus Type			
	Imperative	"Can you?"	"What's this?"	Target
Informing*.....	2%	10%	61%	31%
Conflated.....	6%	13%	8%	23%
Simple action.....	63%	52%	2%	15%
Nonstandard.....	29%	25%	29%	30%
Number of Stimuli..	48	48	48	768

*includes simple informing and reference responses

The finding that there is a contingency between wording and response does not support a strategic model for children of this age. This indicates that early investigations were limited to too narrow a range of wordings.

The overall pattern supports a cue utilization model. The responses to imperative forms are largely confined to the simple action class. This is also true of the "Can you...?" form; the lack of difference between imperatives and "Can you...?" indicates that direct and indirect directives are perceived as equally direct. "What's this?" exhibits a pattern which is different from that of the more ambiguous target forms, again in line with the cuing model. Nonstandard responses are more or less constant across stimulus types, indicating that all forms were equally comprehensible or meaningful to children.

The profile of responses to target questions deserves special consideration. In an adult structural model, these are direct test questions, and were even used as such by the parents of these children. Given that the context is felicitous for a testing interpretations, why did these children answer with informing on fewer than one-third of the occasions?

It is not simply a matter that some children are appropriately offering informing responses whereas other children simply lack the pragmatic acumen to respond in the structurally appropriate manner. Table 7 shows that, while individual patterns do exist, no child confined his or her responses to a single pattern. (Age and skill effects will be discussed later.) These questions are <u>not</u> assigned a unitary pragmatic function, either informing or action, by any child.

Table 7

Individual Response Profiles *for Target Questions, Experiment I

	Response Type				
Subject	Informing**	Conflated	Simple Action	Nonstandard	Total
YOUNGER					
1.....	15	19	1	13	48
2.....	14	13	14	7	48
3.....	6	0	13	29	48
4.....	12	7	9	20	48
5.....	15	7	5	21	48
6.....	10	7	9	22	48
7.....	16	2	6	20	48
8.....	17	12	8	11	48
OLDER					
9.....	9	20	7	12	48
10.....	27	4	8	9	48
11.....	31	10	3	4	48
12.....	19	24	1	4	48
13.....	1	4	20	23	48
14.....	6	8	8	26	48
15.....	25	19	1	3	48
16.....	19	23	4	2	48

*all data presented as number of responses
**includes simple informing and reference responses

Rather, they are treated as ambiguous, with children varying their responses from occasion to occasion. The overall response profile, then, is not consonant with either a structural or a strategic model.

Conflated responses

The rate of conflated response is high enough that adding these responses to the category of informing would raise the rate of informing to over 50 percent, consequently supporting at least a version of a structural model. This can be legitimately accomplished, however, only if there is evidence that conflated responses are primarily informing responses.

Previous investigations (e.g., Shatz, 1978b) of responses to ambiguous questions have generally not distinguished conflated responses from unitary function responses, so little information is available on this point. Clark (1979) has suggested that, for certain types of contexted utterances, the responder must reply with a literal or direct meaning move before he or she responds to the derived or indirect meaning, in cases of dual function responses. Although Clark's utterance types and contexts were distinctly different from those used here, the data partially substantiate his view. While the informative portion (the direct meaning by a structural model) of the response was instigated prior to the action component (29%) more frequently than the reverse (13%), this difference is not significant. Significantly more common than either of these was simultaneous, or true, conflation, 58%, F (2,28) = 24.56, p <.001.

The rate of primary informative components in conflation does not

appear to be high enough to warrant classifying conflated responses along with clear cases of informing. In other words, it is difficult to credit the structural model with additional evidence.

Answering the question

Aside from the lack of a clearly dominant response, I have not addressed the strategic model's notion of response heuristics. A response heuristic should not result in a reply that is well-tailored to the question, except fortuitously. The existence of such strategies can thus be tested by dividing the target question set into two classes —those questions which require specification of an act (e.g., "What do you do with an apple?") and those which require specification of an object (e.g., "What do you eat?"). Since the strategic model has concerned itself with action responses, it is appropriate to look at all responses in which an action occurs (i.e., conflated and action responses), examining them in order to determine whether or not they are related to the type of question asked. A second possible response strategy, one offered by the cue utilization model, is available for comparison; all cases of orientation in response (simple orientation, most reference responses) can be examined. A third class of nonverbal responses, indications (simple informings expressed nonverbally), is also available for the investigation of strategy.

Children who are using a nonlinguistic action or orienting strategy should not respond differentially according to question type. Turning to a functional analysis summarized in Table 8, children do in fact respond significantly more often with action to act-required

Table 8

Percentage of each Question-Requirement Type receiving Nonverbal Responses, Experiment I

	Question-Requirement	
Type of Nonverbal Response	Act-Required	Object-Required
Action.....	45.8%	34.4%
Indication.....	3.7%	7.3%
Orientation.....	21.1%	24.7%

questions than they do to object-required questions wherein an action response is appropriate but superfluous, F (1,14) = 7.27, p <.025. There was also a tendency for children to produce more indication responses (pointing and showing) to object-required questions, F (1,14) = 3.41, p <.10. Orientation (both simple and accompanying informing), on the other hand, appears stable across question type, F (1,14) = 1.25, p >.10. Orientation may be a simple strategy unrelated to the processing of linguistic information, but action and nonverbal informing may be formulated on the basis of sentential processing. Evidence thus seems to indicate that orienting responses are strategies and should not be considered as direct answers to questions. To borrow Goffman's (1976) terminology, they may be responses, but they are not replies. Actions, however, do seem to be valid replies, and not strategies at all.

There is no dominant response to target questions. Conflated responses to target questions tend to be simultaneously, rather than successively, conflated. And the only nonverbal response not clearly related to the question (i.e., probably strategic) is orientation, and not action. These findings favour a cue utilization model.

Contextual Effects on Responses to Targets

Each target question was presented under six different contextual conditions in the course of Experiment I, and under two additional contexts in Experiment II. The contexts manipulated were: preceding discourse (three levels), gesture (two levels), and type of toy (three levels). These contexts were designed to test hypotheses generated by

the structural (no effect on meaningful responses), strategic (informing discourse and pictures inhibit action) and cuing (gestural and toy type effects) models of response. The effects of the two contextual variables manipulated in Experiment I are presented separately from the contextual manipulations which spanned Experiments I and II. Age by context interactions will be presented in a later section.

Experiment I: Gesture and discourse

The results of Experiment I are presented in Table 9. The effects of context will be discussed first in relation to nonstandard responses.

Less than 10 percent of target questions received responses which were ambiguous and not codable. There were no context effects.

Slightly over 10 percent of all target questions were ignored. That is, the child appeared not to have heard the question. A discourse by gesture interaction, F (2,28) = 15.76, p <.01, and a main effect for gesture, F (1,14) = 11.40, p <.01, were obtained. Sheffé comparisons reveal that gestures significantly reduce ignoring except when they follow informative discourse. Informative discourse is devoted to engaging the child in looking and talking prior to the asking of a question, thus mitigating the attention-securing function of gestures.

Simple orienting responses are significantly increased in frequency by the presence of a gesture, F (1,14) = 5.40, p <.05. Simple orientation is sensitive to the presence of a gesture.

No gestural effect was obtained, however, for the simple acting response, F (1,14) = 2.84, p >.10. The gestural effect, therefore,

Table 9

Distribution of Functional Response Types by Experimental Condition, Experiment I

	Condition						
	Directive		Informational		Neutral		
Functional Response	Gestured	NoGest	Gestured	NoGest	Gestured	NoGest	Total
MEANINGFUL							
Simple informing.....	17	26	19	27	12	39	140
Reference.....	18	17	20	9	25	13	102
Conflated.....	28	22	31	28	39	20	178
Simple acting.....	24	19	22	16	19	17	117
NONSTANDARD							
Simple orienting.....	15	9	13	6	17	8	68
Ignoring.....	6	24	13	21	6	23	93
Ambiguous.....	10	11	10	21	10	8	70
Total.....	128	128	128	128	128	128	768

would not seem to apply to all responses which tend toward nonverbal expression.

The presence of a gesture dramatically reduced the frequency of simple informing responses, F (1,14) = 13.12, p <.005. That is, pointing gestures lower the probability of a response reflecting a straightforward testing interpretation of the question.

Reference responses also reflect a testing interpretation, but one which is embedded in a here-and-now situational context. The presence of a gesture seems to encourage such responses, F (1,14) = 9.23, p <.01. Children respond to gestured questions by orienting to an object and producing an informing response concurrently, on occasion. Recall that simple orientations also are more frequent under gestured conditions. Gestures serve to elicit orientation; these orientations are, on occasion, accompanied by informing responses to the question.

There is a corresponding gestural effect for conflated responses. These are also increased by the presence of a gesture, F (1,14) = 15.36, p <.005.

Response types can be collapsed to allow a more thorough investigation of the role of context in children's responses. Simple orienting responses and reference responses can be combined to yield an index for overall orientation; conflated responses can be combined with simple acting responses to yield an overall action index; the addition of reference and simple informing responses offers an index of informing rate.

In line with the above effects, the overall rate of orientation is

increased only by the presence of a gesture, F (1,14) = 21.10, p <.001. Overall action responses are also more frequent under gestured conditions, F (1,14) = 23.98, p <.001.

However, there is no gestural effect on overall informing responses, F (1,14) = 1.44, p >.10. A gesture may inhibit the production of purely informative responses, but it does not seem to be taken as a cue that an informational response is not appropriate.

Responses to setting sequences. In order to assess the effect of the preceding discourse on children, children's responses to setting sequences were examined. Responses to the imperative or declarative sentences immediately preceding targets were coded as action, as attentive looking or talking, or as uncodable due to uncertain attentiveness, gaze direction, or conflation of response. As indicated in Table 10, approximately three-quarters of the setting sequences were responded to in a functionally appropriate manner. Cases in which a child responded with action to declarative setting sentences were rare; cases of simple attentiveness or talking in response to imperative setting sentences did not occur. Approximately 17% of all setting sequences offered were clearly ignored, a rate similar to that observed in response to the target questions (13%). Children do not appear to be ignoring the setting sequences as a rule, and they are generally responding to the sequences in a functionally appropriate manner. The lack of preceding discourse effects on subsequent responses to target questions cannot be attributed to the child's functional set preceding the targets. Children are, by and large, responding to the preceding

Table 10

Type and Number of Responses to Setting Sequences, Experiment I

	Directive Set			Informational Set		
Subject	Acts	Look/Talks	Ignores	Acts	Looks/Talks	Ignores
YOUNGER						
1.....	11	0	5	0	9	4
2.....	12	0	4	0	13	3
3.....	10	0	5	0	11	4
4.....	2	0	2	0	7	1
5.....	6	0	0	2	4	0
6.....	11	0	3	0	9	1
7.....	12	0	3	1	12	2
8.....	14	0	1	3	9	7
% codable responses	77%	0%	23%	3%	75%	22%
OLDER						
9.....	10	0	5	0	6	7
10.....	13	0	2	0	7	3
11.....	14	0	0	0	9	2
12.....	14	0	1	0	11	2
13.....	13	0	1	2	6	3
14.....	13	0	3	0	8	6
15.....	14	0	2	0	12	4
16.....	14	0	1	3	11	1
% codable responses	87%	0%	13%	5%	68%	27%

Note: Each child was given 16 directive settings and 16 informational settings, but response to the setting was not coded in cases where attentiveness, direction of gaze, or function of response was not clear.

discourse, but this does not seem to affect their responses to target What-questions.

Summary of Experiment I data. The above analyses converge on two basic principles.

(1) A gesture induces an orienting response.

(2) Although children attended to the discourse which preceded What-questions, this discourse did not affect the function of their responses to the questions themselves.

Experiment I vs. Experiment II: Toy type

Following completion of Experiment I, each child participated in a second experiment. The target question frames used in this experiment were identical to those used in Experiment I, although an individual child did not hear the same wordings in the two experiments. Each child was, as in Experiment I, asked to respond to two wordings of each question frame. Each wording was presented twice, once in conjunction with a relevant picture and once in conjunction with an irrelevant toy. For comparison with Experiment I data, data from Experiments I and II were converted to percentages. For the most common comparison, that of Experiment I to Toys II to Pictures II, the ratio of questions asked was 6:1:1.

Some analyses were confounded by the experimenter's deviation from the Experiment II script. Although all questions were to be asked as if they were Neutral-NoGesture, an examination of the video records revealed systematic drifts towards informative discourse and gesturing.

Table 11 presents the deviations from the scripted Neutral-NoGesture context of Experiment II, expressed in terms of the number and percentage of questions which were not embedded in a Neutral-NoGesture context.

A drift is apparent for questions associated with pictures. It has been noted by Murphy (1978) and Ninio and Bruner (1978) that mothers use informative discourse and pointing when looking through books with their children. This seems to capture much of what the experimenter is doing. If the present data are any indication, the tendency to talk informatively and point while looking through books with little children is fairly strong and overrides procedural instruction not to do so. Shifts to informative discourse account for 32% of all deviations. Although these shifts were more frequent for pictures than for toys, this effect was not significant, χ^2 (1) = .01, $p > .10$.

Since no experimental effect was found for discourse type in Experiment I, the slight shift to informative talk here is probably of no consequence. Questions inadvertantly preceded by informative discourse in Experiment II received a 61% rate of informing overall, compared with 67% of questions not so preceded. The lack of a discourse effect revealed in Experiment I also seems to show up in Experiment II, at least for informative discourse. The relatively high rate of gesturing, in contrast, may very well affect interpretation of Experiment II data. In Experiment I, gestures raised the frequency of orienting responses, while lowering the frequency of simple informing responses. However, Experiment II was structured to preclude a great number of orientation responses (by ensuring that orientation was

Table 11

Number of Target Questions by Contextual Embeddings, Experiment II

	Type of Contextual Embedding							
	Directive		Informative		Neutral			
Condition	Gesture	NoGest	Gesture	NoGest	Gesture	NoGest	Number of Questions	Percent Deviation
Pictures II....	1	1	30	24	24	48	128	63%
Toys II.....	1	1	2	27	14	83	128	35%
Percent Deviation.....	1%	1%	13%	20%	15%	NA	256	49%

Note: Neutral-NoGesture was the scripted condition of presentation. Hence, deviations are deviations away from this type of contextual embedding.

established prior to the question).

Codability. Is Experiment II, as a distinctly non-normal context and interaction, confusing to the children in the sample? Apparently not. The percentage of codable responses (meaningful responses and simple orientations) is presented in Table 12. There are no effects of experiment type, F (2,28) = 2.54 p > .10. Recall, however, that fewer of the Experiment II than Experiment I questions were gestured, when compared with all other data cells. Gestures in Experiment I were associated with a higher frequency of codable responses, due to the association between gestures and the orienting response. In Experiment II, therefore, the rate of codable response was examined across gestural accompaniments of target questions. Codable responses occured at approximately 71% regardless of the presence of a gesture, χ^2 (1) = .002, p >.10. Since the structure of the experiment biases against the orientation to gesture by ensuring orientation prior to stimulus presentation, the gesturing directed to children does not seem to be of consequence in experimental comparisons.

Function of response. In place of exclusive function indices, general function indices were used to avoid problems of low frequencies. Table 13 shows that type of experiment did not affect the percentage of questions which received informing response components, F (2,28) = 1.29, p >.10.

There is a more striking effect of experimental type on the percentage of action responses, F (2,28) = 53.67, p <.001. Here Scheffé comparisons reveal that each experiment type elicits a distinctly

Table 12

Percentage of Questions receiving Codable Responses* in Experiments I and II

	Experiment Type			
Age Group	Experiment I	Toys II	Pictures II	Total
Younger.....	72%	74%	63%	71%
Older.....	82%	75%	72%	79%
Total.....	77%	74%	67%	75%

*Meaningful responses and simple orientations combined

Table 13

Percentage of Questions receiving Response Components in Experiments I and II

	Experiment Type			
Component	Experiment I	Toys II	Pictures II	Total
Informing.....	55%	56%	64%	56%
Action.....	39%	26%	2%	32%

different rate of action responses. Hence there is some indication that children are tailoring action responses to linguistically encoded input. The rate of action responses to the inappropriate Toys II questions is not very high, being midway between that for appropriate toy-contexted questions and that of appropriate picture-contexted questions. It would thus appear that children are capable of perceiving mismatches between linguistic content and object context in the selection of a response, although they do not always make that connection. That What-questions do not automatically stimulate action responses is reflected in the almost total absence of action responses in the Pictures II condition.

Summary of Experiment II data. The following represent the main points of Experiment II performance.

(1) The protocol for asking questions in a 'neutral' setting was not followed by the experimenter. Almost one-half of the questions asked while the child was looking at a picture was preceded by informational discourse. Furthermore, many questions directed at children were accompanied by gestures. It appears difficult not to talk about pictures when looking through them with children. Additionally, it seems difficult to inhibit gestures while talking with very young children.

(2) On a very global level, the experimental procedure did not seem to be confusing to the children. Experiment II questions received the same percentage of codable responses as Experiment I questions. This lack of effect did not appear to be attributable to the protocol deviations mentioned above.

(3) The rate of informing-class responses did not vary across experiment, with slightly over one-half of all questions receiving informing components.

(4) Action interpretations, in contrast, were sensitive to such contextual variations. These interpretations are essentially absent when a child is looking at a picture; they occur in response to about one-quarter of target questions asked while the child is attending to an irrelevant toy; and they occur to approximately one-third of target questions asked during a normal play session.

Summary of Contextual Effects

The absence of a preceding discourse effect on response supports a structuralist model of question response and disconfirms a strategic model, in light of children's appropriate responses to setting sequences. As previously mentioned, the cue utilization model has taken no stance on the effect of preceding discourse. Hence, there is no evidence for or against this model on this point.

The presence of a gestural effect can be viewed as evidence against the structuralist model. The strategic model makes no firm commitments about the effects of gesture. Therefore, the gestural effect provides weak evidence against this stance. The effect does support a cuing model in that the presence of a gesture affects the production of orientation-accompanied responses and conflated responses.

The effect of toy activity on action response components favors both a strategic and cue utilization model. The constancy of informing components, however, is in line with a structural model.

While all models can be supported to some extent by various dimensions of the results, only the cue model is not faced with some contrary facts. As with wording, then, the data seem to favor a cue utilization model. However, a final decision must await an analysis of how responses change across age and linguistic skill.

Age/Linguistic Skill Effects

The responses to target questions, broken down by age, are displayed according to the fully differentiated response code in Table 14. The response pattern can still be seen as a scatter, exhibiting no strong tendency to favor a structrualist or strategic model. But there are age trends of interest in these data. Age and skill effects will be discussed by three main topics: (1) simple age effects, (2) age vs. language grouping, and (3) age interaction effects.

Simple age effects

Many responses which reflected an ambiguity or lack of clarity on either the coder's or the child's part were scattered thinly but evenly over the subtypes of this category. As Table 14 indicates, younger children gave significantly more of these unclear or ambiguous responses than did older children, F (1,14) = 6.66, $p < .025$. This suggests that with increasing age, children's responses show greater convergence with the adult pragmatic system in that they are better able to produce responses that are clear and easily interpreted by an adult observer, and which fall into functionally appropriate categories.

There are no other significant simple age effects.

Table 14

Distribution of Functional Response Types by Age,

Experiment I

Functional Response	One-Year-Olds n	(%)	Two-Year-Olds n	(%)	Total n	(%)
Simple informing.....	64	(17%)	76	(20%)	140	(18%)
Reference.....	41	(11%)	61	(16%)	102	(13%)
Conflated.....	67	(17%)	111	(29%)	178	(23%)
Simple action.....	65	(17%)	52	(14%)	117	(15%)
Simple orienting.....	49	(13%)	19	(5%)	68	(9%)
Ignoring.....	48	(13%)	45	(12%)	93	(12%)
Ambiguous.....	50	(13%)	20	(5%)	70	(9%)
Total	384	(101%)	384	(101%)	768	(99%)

Age vs. language grouping

Earlier, it was suggested that, instead of age-group classification, children could be classified into two nonoverlapping linguistic skill groups. Certain linguistic skill effects, even in the absence of age effects, could be construed as support for a structural theory predicted on a primary, grammatically-based function. That is, although age group analyses reveal few main effects of age, it may still be worthwhile to group children by linguistic criteria. But on 12 selected dependent variables, in no case did regrouping children into two linguistic groups (MLU = 1.6 $\pm$) result in a greater between-group difference. On nine of these variables, the between-age differences were larger than the between-linguistic group differences. On a two-tailed sign test, this group criterion effect is significant, $p < .004$. For the range of children selected, age differences result in stronger effects than do differences in linguistic skill.

Although this pattern is suggestive, the difference is between marginal to nonsignificant effects and even smaller effects. It is likely that a somewhat wider separation between age groups would have resulted in a greater number of significant age effects, but such a separation would also dispense with the age-linguistic group cross-over obtained. Despite significant differences in the linguistic skills of the two age groups, the group effects suggested by these data seem not to be strongly associated with independent assessments of linguistic skill.

Age interaction effects

Age was involved in four different but ultimately interrelated interactions.

First, there is an interaction between age and gesture in the offering of responses which contain action components, F (1,14) = 6.72, $p < .025$. Scheffé comparisons reveal that only older children offer an elevated number of action-class responses to gestured questions. That is, action components are produced most frequently by two-year-old children under gestured conditions.

Since there is no interaction between age and gesture for simple action responses, this result is largely attributable to an age by gesture effect on conflated responses, F (1,14) = 6.67, $p < .025$. Table 15 shows that, when older children observe gestured target utterances, they double their rate of conflated response. These results are not in line with the strategic model's prediction of a developmental increase in sensitivity to stop-action markers.

The third age interaction effect is also associated with conflated responses. Two-year-olds produce a much higher rate of true or simultaneous conflation than do one-year-olds, F (1,28) = 13.03, $p < .001$. As Table 16 suggests, older children may tend to interpret target questions as truly ambiguous.

Only three children from the younger group responded with two components simultaneously more frequently than with first one component, then the other. Every child in the older group did so. This ability to produce simultaneous conflation does not appear to be related to

Table 15

Number of Action-Class Responses by Age and Gestural Condition, Experiment I

	Gestural Condition		
Response	Gestured	No Gesture	Total
Younger			
Simple acting...	35	30	65
Conflation.....	36	31	67
Total.....	71	61	132
Older			
Simple acting...	30	22	52
Conflation.....	72	39	111
Total.....	102	61	163

Table 16

Directionality of Response Components in the Conflation of Action and Informing, Experiment I

	Direction of Response Components			
Group	Action--▷ Informing	Simultaneous	Informing--▷ Action	Total
Younger..	21%	41%	38%	100%
Older....	8%	67%	25%	100%
Total	13%	58%	29%	

linguistic sophistication, since the two linguistically advanced girls in the younger group were clear one-reply-at-a-time responders.

This increase in true conflation may be due to an increase in the ability to perform any two responses simultaneously, as an identical effect obtains for reference responses. Older children, when they offer a reference response, look and inform at the same time, while younger children do not do this any more frequently than the remaining two directionality patterns, interaction F (1,28) = 4.42, $p < .05$, Scheffé comparisons.

Summary

Not only is there no dominant functional response to target questions, but there are only two simple age-or skill-related changes in response. The decrease in ambiguous responses with age can be handled by either a structuralist or a cuing model. The increase in simultaneous conflation lends a slight advantage to the cuing model, as it may indicate advances in the perception of ambiguity, or at least in the ability to express such interpretations. The lack of linguistic group effects does not disconfirm a structuralist model, but neither does it lend any direct support, especially in light of linguistic group differences which are smaller than age group differences. An increasing ability to exploit contextual cues is consonant with both the strategic model and the cue utilization model; since this increase is towards, rather than away from, action responding, the latter model would seem more appropriate.

Overall, the developmental phenomena presented by these data are

most easily accommodated by the cue utilization model. Change is towards the abandonment of ambiguous responses, towards a facility in producing unitary responses out of disparate components, and towards exploiting gesture as an interpretive cue.

V. DISCUSSION

Whenever there is talk, there are questions and responses. Questions and responses, taken together, are frequently considered to form a minimal dialogic unit—the adjacency pair (Churchill, 1978; Goffman, 1976; Sacks, note 3). A common investigative procedure is to collect samples of such adjacency pairs and examine how the response (even silence) serves as an answer or rejoinder to the question. What is often given perfunctory consideration, but rarely systematic attention, is which properties of the question and its situation are related to the response.

There are three models for how conversational participants produce contextually-embedded responses to questions and which aspects of an interaction are critical in question-response contingencies. The first model emphasizes the role of literal understanding and rather abstract aspects of the communicative situation, the second the cognitive nature of the interactants, and the third the role of learned, observable markers of intentionality.

Sources of Variation

In this investigation, three types of evidence were assembled in order to assess the validity of the response models. The first is the effect that the wording or syntactic form of the stimulus has on children's responses; the second, the effects of context on responses to one of those syntactic forms; the third, the presence of develop-

mental effects on responses to the targeted syntactic form.

Wording

Equivalent contents were worded in four different ways: as imperatives, "Can you" questions, "What's that", and as complex What-questions. We already know that young children's responses vary with question form (e.g., Dore, 1977; Ervin-Tripp, 1970), but those data have come largely from natural sources, and not ones in which content and context were controlled. The items used here were presented under conditions which support the following structural assignments: direct directive (imperative), conventional directive ("Can you...?"), and direct test ("What's that?" and complex What-questions).

Wording as a source of variation in response is a central concern of the structual model. As outlined earlier, theoretical work has emphasized the importance of a functional assignment on the basis of literal meaning as a component in the interpretation of speech acts (see especially, Searle, 1975). Performance models based on structural theory, consequently, have focused on confirming that literal meaning is processed (e.g., Carrell, 1981; Clark, 1979; Clark & Lucy, 1975; Clark & Schunk, 1980). Hence, if the validity of the structural model is to be verified, it is essential that children's responses be shown to vary with the syntactic form of an utterance.

The strategic model, in contrast, generates the proposal that there should be few consistent effects of wording on response. One- and two-year-olds are presumed to lack the necessary syntactic and pragmatic abilities (Shatz, 1978b). While there may exist some

emerging linguistic skills in children of this age, the strategic model is not likely to be appropriate if there are strong effects of wording on response.

In contrast to strategic theory and in alignment with the structural model, the cue utilization model considers wording to be an important source of variation in interactional response. But since this effect is mediated by factors different from those associated with structural models (Cole, 1974; Sadock, 1972), the predicted wording-response pattern is discriminably different from that suggested by a structural analysis.

Context

When context is entertained as a source of variation in interactions, it must be made clear what types or aspects of context are under consideration. All three models incorporate the notion of contextedness as essential to human communication. But there are disagreements over what aspects of the total interaction can be expected to have an impact on the participants. The complex What-questions used in the current experiments were presented while three aspects of context were manipulated—the pragmatic function of the discourse which immediately preceded the question (directive, informational, neutral), the gestural accompaniment of the question (pointing at referent, no gesture), and the toy activity in which the question was embedded (semistructured play, orientation to a single irrelevant action toy, orientation to a picture illustrating the question).

Because the target questions were consistently presented under

conditions which support a direct testing interpretation (pp. 6-7), and because the above mentioned contexts are not of the type which structural theorists emphasize (p. 7), the structural model suggests that children's responses should not vary with these contexts. That is, while the notion of context is a crucial one for structural theory, it would not consider the types of context manipulated here to be an important source of variation in interaction.

The strategic model, in contrast, suggests that some of these contexts might affect response. Contexts which could operate through the direct inhibition of the action heuristic are considered as potential sources of variation (p. 9). Informational discourse might operate in this manner, as could the absence of a toy upon which to act. The absence of a relevant toy upon which to act should tend to inhibit action, but this affect would be relatively weak for children of this age.

The cue utilization model also considers context, especially of the types manipulated here, as a source of response variation. The mechanism suggested is rather different from that mentioned above. Instead of operating via response inhibition, context is presumed to elicit direct functional responses (p. 13).

Developmental level

The final source of variation in these experiments is the developmental level of the participants. While the questioner remained the same for all, the children belonged to two different age groups (one- and two-year-olds) and fell across a range of linguistic development.

The structural model is largely static and nondevelopmental. However, processing models developed from structural speech act theory can be used to generate developmental hypotheses. Most importantly, linguistic status should be a detectable source of response variation. The predicted change is from nonstandard responses to informing responses. However, it is only fair to note at this point that the structural theories are end-point models and characterizations of adult competency, and so cannot rise or fall according to the trajectory of very early development.

Strategic theory provides a counterpoint in that its predominant concern is with age-related phenomena. Specifically, it postulates a developmental decrease in action responding. This decrease is expected to be especially apparent in action-inhibitory contexts (e.g., after informative discourse). One can assume that this decrease accompanies age-related increases in informing-class responses.

Assuming convergence with the adult system, the cue utilization model aligns with the structural model in anticipating developmental decreases in nonstandard responses. But because the cuing model has little investment in either speech act classification or literal force indicators, it does not argue that this and other changes are necessarily linked to changes in grammatical skill and understanding. In a developing organism, expanding symbol usage is not the only aspect of growth which affects behavior. Individual history and experience may result in patterns which are not directly associated with what is traditionally regarded as linguistic growth. For this reason also, the developmental patterns may not resemble an appropriate structural

course. Responses may reflect variations in a variety of developmental indices (e.g., age, linguistic status). They do so because children's conceptions of the pragmatic system change as they negotiate their way towards an integration of wording, context, and pragmatic function.

The importance of the three sources of variation differs for the three models of pragmatic response. While each model can be used to generate some hypothesis about the role of these independent variables, the variables are not necessarily of equal concern to the three models. Wording is of prime concern to structural models, developmental effects to the strategic model, and context to the cue utilization model. While each factor in turn may not be of equal relevance to all models, the manipulation of all three may nonetheless allow the selection of one model over the others as the model which best characterizes the interactional skills of very young children.

Patterns of Evidence

The structural model acquires limited support from the data presented here. When the same content was worded in different ways, children used the wording of a message to formulate a response. In response to imperative wording, a direct encoding of directive intent, children generally offered simple acting responses. The same was true for the most common conventional directive of maternal speech—the "Can you" question. In contrast, the direct test "What's this?" received predominantly informing responses. But the data are not uniformly supportive. The literal meaning of "Can you...?" questions carries an informing force, but there is little tendency for these

children to misinterpret these questions as information requests. One might expect such errors from learners, but they do not occur with appreciable frequency. On the other hand, the targeted What-questions, despite structural conventionality and parental use for direct conventional informational functions, appeared to be recognized by children as pragmatically ambiguous or nonconventional in wording and in context. These children appear, then, to be making a large number of interpretive errors for questions which, structurally, are much more straightforward than "Can you...?" questions. The overall pattern of response to wording variations is not particularly encouraging for structural theory.

An equivocal pattern also emerges when the effects of context on response are considered. Because the target questions were presented under conditions which support a testing interpretation, these questions can be classified as direct tests under a structural model. Since direct speech acts do not warrant further context-checking action (and the model de-emphasizes the role of concrete conditions in any case), the variables manipulated in the present experiments should have no impact on responses. In fact, there is no effect of preceding discourse, and this finding supports a structural interpretation. However, gesture and toy type <u>do</u> affect response, and this argues against the model's validity.

Somewhat more clearly, age and linguistic status effects do not support a structural model. The effect of one contextual variable—gesture—increases rather than decreases with age. Linguistic status, at least within the range sampled here, is not related to response.

Furthermore, linguistic status groupings result in less separation than do age groupings, when magnitude of group divergence is the criterion.

The experimental data, then, do not align with a structural speech act model of communicative interaction, at least as specified in the performance terms used here. While children do attend to the wording of speech addressed to them and while they do generally offer structurally meaningful replies, there is little evidence that their responses reflect a system of structured relationship among wording, abstract contextual conditions, and logic.

The picture is little better for the strategic model of adult-child interaction. While children do offer structurally-unwarranted action responses to What-questions, such responses do not occur with very high frequency. This cannot be attributed to the acquisition of "What...?" as a stop-action marker, since no child showed anything approaching complete inhibition of action-class responses to target questions. Similarly, an examination of directionality in conflated responses indicates that action responses tend to follow or coincide with informing responses, rather than precede them.

Proponents of the strategic model argue that context serves only to inhibit action, and not to prompt it. It is true that orientation to pictures can reduce the frequency of action responses. These children, however, did not inhibit direct action responses when deliberately involved in informing-type interactions which are embedded in a play setting. The third contextual variable, gesture, actually served to increase the rate of conflated responses. This finding cannot be explained by a simple strategic model.

With respect to age and status changes, there is no evidence of a developmental weakening of action responses. Nor is there any increasing exploitation of stop-action markers. While it is true that sensitivity to one cue increases with age, this change is toward exploitation of a pro-conflation cue, and not a stop-action marker.

Although these children are very young, a strategic model of interaction does not seem appropriate. They evidence a sense that the target questions require informing responses or that, at least, they are ambiguous. If there ever was an impulse to act in a physical sense, it has been left far behind.

Obviously, neither model is clearly supported by the data. The most common response to targets overall was the conflated response, followed by the simple informing response, the simple acting response, and reference, in that order and excluding nonstandard types. The differences in frequency, however, are not strong and are not consistent for both age groups. There is little or no evidence to favor either a purely strategic or purely structural model in these data.

Rather than a simple structural speech act model or a simple strategy model, the following pattern seems to apply to these data. By the time children begin to talk, the action response is largely constrained to those forms which are routine directives. By this time, the reference response is clearly associated with the most common routine test question. In cases where the linguistically encoded message does not warrant a routine interpretation, one-year-olds scatter their responses haphazardly across potentially appropriate pragmatic types and a few inappropriate ones. In the same situation, two-

year-olds are more systematic in that they attempt to use contextual cues in selecting either a direct (informing) or nonconventional (action) response.

In place of a simple structural or a simple strategic model, these data suggest that responses offered by language-learning children best fit an intermediary pattern. There is indeed development towards an adult-like pragmatic system, in that structurally appropriate responses would seem to account for a greater proportion of answers offered by two-year-olds than by one-year-olds. There is also evidence for a response 'strategy', although it is not the same strategy identified by Shatz. But the essence of these children's responses is best captured by a model wherein responders are influenced by the presentation of discrete linguistic and situational cues in their selection of a pragmatic response. This is precisely the model suggested by Austin (1975) for characterizing actual performance rather than theoretical structure.

It is appropriate to return to Austin and borrow his statement that what is said here is neither difficult or contentious. Most structuralists would not be disturbed by the observation that the performance of very young children cannot be predicted completely by structural theory. Structural theory is, after all, a theory of logic and linguistics, the construction of proofs for how it is possible that language can be used to certain ends--in short, a competence theory. That there are performance phenomena that exceed the parameters of the preformulated system would not be particularly disturbing to most structuralists. Yet these findings indicate that the performance models developed from structural theory are not entirely adequate.

The easiest modification to such models would be the incorporation of additional kinds of contextual conditions into the level at which felicity conditions are evaluated. For example, an adult-child play context such as that used here might function to alert the child to the possibility that directive interpretations may be warranted even when the defining conditions for a direct test are met. A structural model might lose some clarity, but it would certainly gain validity as a description of performance by incorporating at least some features of cue utilization.

On the other hand, the current findings are already consistent with the cuing model and with contextualist theories in general. As Cicourel (1980) has pointed out, communication can be viewed as part of a complex, multifaceted system. Action and discourse are embedded in and sustained by layers of context ranging in globality from eye gaze to sociocultural setting. The meaning of any act, therefore, must be at least partially defined in terms of external conditions that go beyond the surface linguistic information of the act itself. Although these data support such a contextualist view of adult-child discourse and can be taken as a contribution to the contextualist study of action, they highlight some problems with the contextualist approach. First of all, the contextualist view tends to shortchange the role of intentionality in action, a bias consistently combatted only by Goffman (1959, 1967, 1969, 1981). Unlike the structuralist approach, contextualism obscures the essential intentions of speakers and responders, focusing instead on observable behaviors such as gesture and gaze. While the study of natural discourse is incomplete without the consideration of such overt behavioral cues, one is frequently left with little

understanding of what was actually intended by an act or how that act was indeed perceived. Second, perhaps due to this de-emphasis of intentionality as a cohesive force, contextualist theories are somewhat dispersive. There have been few attempts to organize findings about different facets of context into a coherent predictive system. It is likely that any adequate systematization would have to include aspects of structural theory (e.g., communicative intent).

There are two options here. Structural theory can accommodate overt contextual cues into performance models, but the adaptation might not be an easy one; contextual cuing theory assimilates new evidence rather easily, but does so by simply adding it to the list rather than by assigning it a consistent and meaningful role in a larger view of communicative intentions. How these data are aligned depends on the world views of those who evaluate them. For those who view discourse as an exemplar of human rationality, children's sensitivity to wording and gesture are best seen as a step towards understanding a system that is coherent and structured. Conversely, investigators approaching any human act as reflecting emergent properties of social interaction may see children's performance as revealing a movement towards a subtle system of contexted discourse. To date, there have been few efforts to integrate the clear formalisms of structural theory and the local production properties of contextual cuing theories. There is little doubt that a unified, integrated theory would be a worthwhile endeavour, expanding the scope and applicability of structural theory while lending intentionality and coherence to cuing models.

In such an integrated theory, the ability to respond to messages would be seen as a counterbalancing of constraining forces which are

internal (child perceptions and knowledge) and external (pragmatic cues and structures). The children in this sample are attempting to negotiate their way through an incompletely understood structured system by organizing some available surface cues into a simple scheme for responding to conversational events.

APPENDIX A

DEBRIEFING INTERVIEW

Before I tell you some of the thing I was looking for, I would like to ask you some questions about how you talk to your child:

What sort of questions do you ask your child? For example, do you ask a lot of "What's this?" questions, or a lot of "What does a cat say?" questions?

Do you think that your child knows the words I used in my questions, and the words he or she would need in order to answer the questions verbally? Does s/he know the names of common animals? objects? foods? clothing? Does s/he use the words, or merely understand them when others use them?

Let's go over the four types of questions I used, and you tell me whether you would expect your child to give a good answer: (a) almost every time it was asked, (b) only in certain phrasings or in certain situations, or (c) not at all, i.e., you would be surprised if s/he gave a good answer. (Go over each question type). Why do you think s/he could/could not answer these questions?

Do you have any question, naming, or action games that you often play with your child? What are they? Are those games any different from the games you used to play? For example, did you use to play a lot of "Where's your nose?" or "What's this?" games, but now play a lot more "What colour is this?" or fantasy games? How do/did you use these games?

Does your child name things spontaneously, or ask for the names of

objects and people? Is this a frequent occurrence?

What kinds of play does your child engage in? Does s/he imitate people, objects, and actions after the fact? For example, does s/he pretend to go to sleep when it's not bedtime, or pretend to feed dolls, or pretend that objects are something entirely different? Any make-believe or pretend play of any sort? Is your child familiar with the toys I brought to your house?

Does your child imitate what you say, either immediately or much later? If s/he does, is it appropriate? Some children imitate words and sentences when they are confused, or when they don't know how to answer a question--does your child ever do this?

I asked your child questions designed to determine how children of this age answer some kinds of questions. Most of the questions are questions which can be answered by an action or by talk. I wanted to know how children decide which way to respond, if they respond at all. Now no child ever answers all the questions appropriately, so I have one last question before you ask me whatever you want: what would <u>you</u> do if you asked a question like one of these and your child didn't answer you properly (give the answer, drop it, repeat it?)

APPENDIX B

TABLE 17

ANOVA for percentage of question-requirement types receiving orientation response components, Experiment I

Source	Mean Square	DF	F-Value	p
Age	55.13	1	< 1.00	
Error (a)	210.74	14		
Question-requirement	105.13	1	< 1.00	
Q-requirement X Age	161.99	1	1.25	
Error (b)	130.06	14		

TABLE 18

ANOVA for percentage of question-requirement types receiving action components, Experiment I

Source	Mean Square	DF	F-Value	p
Age	344.53	1	1.31	
Error (a)	262.34	14		
Question-requirement	1023.78	1	7.27	<.025
Q-requirement X Age	47.54	1	<1.00	
Error (b)	140.73	14		

TABLE 19

ANOVA for number of codable responses, Experiment I

Source	Mean Square	DF	F-Value	p
Age	11.35	1	2.21	
Error (a)	5.13	14		
Discourse	2.87	2	2.24	
Discourse X Age	3.66	2	2.86	
Error (b)	1.28	28		
Gesture	38.76	1	16.85	<.01
Gesture X Age	1.26	1	<1.00	
Error (c)	2.30	14		
Gesture X Discourse	.07	2	<1.00	
Gest. X Disc. X Age	1.39	2	1.48	
Error (d)	.94	28		

TABLE 20

ANOVA for number of questions ignored, Experiment I

Source	Mean Square	DF	F-Value	p
Age	.17	1	< 1.00	
Error (a)	2.84	14		
Discourse	.17	2	< 1.00	*
Discourse X Age	.79	2	1.72	*
Error (b)	.43	28		
Gesture	20.17	1	11.40	<.01
Gesture X Age	1.04	1	< 1.00	
Error (c)	1.77	14		
Gesture X Discourse	1.04	2	15.76	<.01*
Gest. X Disc. X Age	2.04	2	30.91	<.01*
Error (d)	.07	28		

* F- values were evaluated for significance using the conservative criterion of reducing the degrees of freedom on the repeated measures variables to 1. The nonconservative F .05(2,28) = 3.34.

TABLE 21

ANOVA for number of ambiguous responses, Experiment I

Source	Mean Square	DF	F-Value	p
Age	7.79	1	6.66	<.025
Error (a)	1.14	14		
Discourse	1.45	2	1.69	*
Discourse X Age	2.91	2	3.38	.05< p<.10*
Error (b)	.86	28		
Gesture	3.01	1	3.04	
Gesture X Age	.02	1	<1.00	
Error (c)	.99	14		
Gesture X Discourse	.95	2	2.02	*
Gesture X Disc. X Age	.82	2	1.74	*
Error (d)	.47	28		

* F-values were evaluated for significance using the conservative criterion of reducing the degrees of freedom on the repeated measures variable to 1. The nonconservative F .05(2,28) = 3.34.

TABLE 22

ANOVA for number of simple orienting responses,

Experiment I

Source	Mean Square	DF	F-Value	p
Age	9.37	1	4.11	.05<p<.10
Error (a)	2.28	14		
Discourse	.40	2	<1.00	
Discourse X Age	.60	2	1.43	
Error (b)	.42	28		
Gesture	4.16	1	5.40	<.05
Gesture X Age	2.67	1	3.47	.05<p<.10
Error (c)	.77	14		
Gesture X Discourse	.14	2	<1.00	
Gesture X Disc. X Age	.70	2	1.34	
Error (d)	.52	28		

TABLE 23

ANOVA for number of simple acting responses,

Experiment I

Source	Mean Square	DF	F-Value	p
Age	2.34	1	<1.00	
Error (a)	4.74	14		
Discourse	.32	2	<1.00	
Discourse X Age	.22	2	<1.00	
Error (b)	1.26	28		
Gesture	1.76	1	2.84	
Gesture X Age	.10	1	<1.00	
Error (c)	.62	14		
Gesture X Discourse	.32	2	<1.00	
Gesture X Disc. X Age	.09	2	<1.00	
Error (d)	.66	28		

TABLE 24

ANOVA for number of reference responses,

Experiment I

Source	Mean Square	DF	F-Value	p
Age	4.16	1	1.32	
Error (a)	3.15	14		
Discourse	.66	2	<1.00	
Discourse X Age	.20	2	<1.00	
Error (b)	1.00	28		
Gesture	6.00	1	9.23	<.01
Gesture X Age	.04	1	<1.00	
Error (c)	.65	14		
Gesture X Discourse	1.16	2	1.33	
Gesture X Disc. X Age	.20	2	<1.00	
Error (d)	.87	28		

TABLE 25

ANOVA for number of conflated responses, Experiment I

Source	Mean Square	DF	F-Value	p
Age	21.09	1	2.01	
Error (a)	10.49	14		
Discourse	.04	2	<1.00	
Discourse X Age	.38	2	<1.00	
Error (b)	1.18	28		
Gesture	17.51	1	15.36	<.01
Gesture X Age	7.60	1	6.67	<.05
Error (c)	1.14	14		
Gesture X Discourse	2.67	2	1.48	
Gesture X Disc. X Age	.49	2	<1.00	
Error (d)	1.81	28		

TABLE 26

ANOVA for number of simple informing responses,

Experiment I

Source	Mean Square	DF	F-Value	p
Age	1.50	1	<1.00	
Error (a)	4.93	14		
Discourse	.32	2	<1.00	*
Discourse X Age	.22	2	<1.00	*
Error (b)	1.13	28		
Gesture	16.66	1	13.12	
Gesture X Age	1.50	1	1.18	
Error (c)	1.27	14		
Gesture X Discourse	3.21	2	3.15	.05<p<.10*
Gesture X Disc. X Age	.59	2	<1.00	*
Error (d)	1.02	28		

* F-values were evaluated for significance by conservative criterion of reducing degrees of freedom on repeated measures to 1. The nonconservative F .05(2,28) = 3.34.

TABLE 27

ANOVA for number of responses that contain orientation, Experiment I

Source	Mean Square	DF	F-Value	p
Age	.51	1	<1.00	
Error (a)	1.96	14		
Discourse	1.54	2	<1.00	*
Discourse X Age	.64	2	<1.00	*
Error (b)	1.77	28		
Gesture	21.10	1	21.10	<.001
Gesture X Age	.26	1	<1.00	
Error (c)	1.00	14		
Gesture X Discourse	2.47	2	2.66	*
Gesture X Disc. X Age	3.20	2	3.44	*
Error (d)	.93	28		

*F-values were evaluated for significance by the conservative criterion of reducing the degrees of freedom on repeated measures variables to 1. The nonconversative F .05(2,28) = 3.34.

TABLE 28

ANOVA for number of responses that contain action,

Experiment I

Source	Mean Square	DF	F-Value	p
Age	10.01	1	1.70	
Error (a)	5.89	14		
Discourse	.88	2	<1.00	
Discourse X Age	.67	2	<1.00	
Error (b)	2.32	28		
Gesture	27.10	1	23.98	<.001
Gesture X Age	7.59	1	6.72	<.025
Error (c)	1.13	14		
Gesture X Discourse	1.50	2	<1.00	
Gesture X Disc. X Age	.88	2	<1.00	
Error (d)	2.19	28		

TABLE 29

ANOVA for number or responses that contain informing,

Experiment I

Source	Mean Square	DF	F-Value	p
Age	10.67	1	<1.00	
Error (a)	10.74	14		
Discourse	.95	2	<1.00	
Discourse X Age	.38	2	<1.00	
Error (b)	1.26	28		
Gesture	2.67	1	1.44	
Gesture X Age	1.04	1	<1.00	
Error (c)	1.85	14		
Gesture X Discourse	2.01	2	<1.00	
Gesture X Disc. X Age	.95	2	<1.00	
Error (d)	2.15	28		

TABLE 30

ANOVA for percentage of questions within circumstances of Experiments given linguistically codable responses

Source	Mean Square	DF	F-Value	p
Age	533.33	1	<1.00	
Error (a)	952.99	14		
Circumstance	411.35	2	2.54	
Circumstance X Age	76.40	2	<1.00	
Error (b)	161.68			

TABLE 31

ANOVA for directionality in conflated responses,

Experiment I

Source	Mean Square	DF	F-Value	p
Age	54.19	1	3.36	.05<p<.10
Error (a)	16.13	14		
Direction	92.34	2	24.56	<.001*
Direction X Age	49.00	2	13.03	<.001*
Error (b)	3.76	28		

*F-values were evaluated for significance by reducing the degrees of freedom on the repeated measures variables to 1.

TABLE 32

ANOVA for directionality in reference responses,

Experiment I

Source	Mean Square	DF	F-Value	p
Age	10.08	1	2.05	
Error (a)	4.92	14		
Direction	33.25	2	7.31	<.025*
Direction X Age	20.09	2	4.42	<.05*
Error (b)	4.55	28		

* F-values were evaluated for significance by conservative criterion of reducing degrees of freedom on repeated measures to 1.

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