

YOUNG CHILDREN'S SPEECH ACT COMPREHENSION: THE ROLE OF  
LINGUISTIC AND CONTEXTUAL INFORMATION

by

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## Abstract

This study addresses the question of the necessity of propositional content in children's comprehension of speech acts. In investigating this aspect of communicative competence in children the study considered the relative importance of age (3, 4), context (Requests, Questions, and Offers), and quantity of propositional content. Two factorial experiments were conducted in which 54 three and four-year-old children were administered a discrimination task, where, through puppet play, contexts were constructed for utterances in order to simulate particular speech acts. Judgments of the illocutionary force of such contexts were elicited by having children decide which one of two paraphrased utterances matched the stimulus utterance. Quantity of linguistic information in the stimulus presentations was progressively reduced. While younger children's performance was relatively unaffected by the reduction of linguistic information, the older children's discrimination of speech acts was relatively adversely affected. These findings were supported by additional data from an elicited imitation task and spontaneous responses. A developmental shift is proposed, from more direct context-dependent strategies of speech act processing to a later more linear or text-dependent approach linked to developing linguistic awareness.

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## CHAPTER ONE

### A PRAGMATIC PERSPECTIVE ON LANGUAGE COMPETENCE

#### 1.1 INTRODUCTION

Successful communication depends not only on the knowledge and assumptions shared by participants about the form of an utterance but also the functions and the conditions under which it can occur (Searle, 1969). Contemporary theories of language acquisition have shifted from a focus on linguistic structures to a broader pragmatic perspective which recognizes that language is an interactive process which takes place in various social and cognitive contexts for different purposes (Bates, 1976; Bloom & Lahey, 1978; Ochs, 1979). In order to function as an effective participant in communicative interaction, a child must learn to use not only the phonological, syntactic, and semantic aspects of language, but the pragmatic aspects as well.

A major task for the child in the course of language development is the gradual move away from contextually bound cues in working out the relationship between meaning and form (Bloom, 1974). It is through the study of pragmatics that our understanding of the development of communicative competence can be enhanced. Hymes (1972) coined this term to describe the ability of speaker-hearers to use their knowledge of form and content appropriately and effectively in conversational contexts. Formalistic approaches which study linguistic utterances in isolation fail to account for

the orientation of language towards communication. Language occurs in an action context, not as an isolated form of input. Like a corridor through which passage is necessary in order to enter and exit the various rooms opening on to it, pragmatics serves as the framework for studying the relationship between linguistic, social, and cognitive development (Bates, 1976; W. James, 1975).

Speech act theory, one particular aspect of pragmatics, has provided the connection between linguistic and social theory. It postulates that the communicative intent, or the illocutionary force, using Searle's term, is determined by the inferences made about the context of an utterance together with knowledge of how linguistic propositions are used. It is the speech act which gives a linguistic utterance its communicative sense (Bierwisch, 1980) and thus it is the speech act rather than the sentence which is the basic unit of communication (Searle, 1969).

Thus, if we are to provide a more complete picture of the development of young children into competent language users, more light must be shed upon the extent to which this pragmatic ability exists and is put to use. That is, how do they learn to coordinate the linguistic features of an utterance with extralinguistic signals in inferring the speaker's intention? It is with this aspect of pragmatics that the present study is concerned. Of specific interest is the investigation of some selected variables which might affect young children's comprehension of speech acts.

### 1.1.1 THEORETICAL SIGNIFICANCE OF THE STUDY

A number of studies which have investigated the development of pragmatic competence have shown that very young children are capable of interpreting the communicative intent of an utterance even when it is not explicitly stated (Ackerman, 1978; Ervin-Tripp, 1976; Reeder, 1980; Shatz, 1978). The process by which children develop the appropriate strategies to infer the indirect meaning, however, is not clearly understood. How does a child, for example, discern the difference between "It's time for bed" as a request and "It's time for Sesame Street" as an assertion? Speech act theory claims that knowledge of both propositional and non-propositional felicity conditions are necessary conditions to assign illocutionary force. However, it has been argued (Shatz, 1983) that attributing to children such a sophisticated understanding of how linguistic and contextual information are coordinated in their understanding of an utterance may not be justified. Instead, Shatz suggests that children initially employ a general pragmatic strategy, namely an action-based response, such as "Mommy says, child does", which is gradually modified as linguistic awareness increases. The question is to what extent this early strategy depends upon linguistic and contextual information in determining intention. Reeder (1980) in his study of the developmental onset of the ability to judge from context the different intentions, concluded that his subjects were able to use contextual cues

but cautioned that their use of linguistic information was at this point open to question. Further research is necessary to help determine the kinds of processing children use when inferring communicative intent.

Recent research on language-disordered children suggest that some of these children may have pragmatic difficulties distinct from any structural language disabilities (Blank, Gessner, & Esposito, 1979; Brinton & Fujiki, 1982; Prinz & Ferrier, 1983). Studies comparing normal and language-disordered children's comprehension and production of directives have identified a similar pattern of development between the two groups although significantly delayed in the latter group (Brinton & Fujiki, 1982; Prinz & Ferrier, 1983; Shatz, et al. 1980). For the language-disordered child, an inability to discern politeness strategies or to attend to propositional content was frequently apparent. In an investigation of the ability of language-impaired children to comprehend, produce, and judge directives, Prinz and Ferrier discovered their subjects had difficulty in recognizing the relative politeness of direct and indirect requests. Brinton and Fujiki's study, comparing normal and language-disordered children's discourse, found that language-disordered children often responded inappropriately to requests. Their responses appeared to be the result of a pragmatic strategy which signalled only that a response was required. Their responses, however, gave little attention to the information

requested, being either contrary to fact or entirely unrelated. Shatz, et al. (1980) also found that these children had difficulty taking prior linguistic context into account. The present research attempts to further our knowledge of the underlying social, linguistic, and cognitive processes in children's comprehension of speech acts.

### 1.1.2 PRACTICAL SIGNIFICANCE OF THE STUDY

It is important to understand how children do use language to organize their experience and to communicate in order to help them develop and extend their communicative competence. This is particularly important for those children, who for various reasons, have developed communicative abilities different from those expected at school.

The processes of becoming educated require that the child's meaning potential should have developed along certain lines in certain types of contexts, especially in relation to the exploration of the environment and of his own part in it... Certain ways of organizing experience through language and of participating and interacting with people and things are necessary for success in school. The child who is not predisposed to this type of experiential and interpersonal context is not at home in the educational world. (Halliday, 1978, p. 26)

They are faced with the difficult task of developing an awareness of a set of highly specific uses of language which are often restricted to the school setting. Reading and writing in particular, demand that children 'disembed' language from its immediate 'here and now' context and view

language as a separate entity (Donaldson, 1978). Language is the primary tool for the transmission of knowledge in school. If children are to be educationally successful, they must learn to make normally 'transparent' language 'opaque' (Cazden, 1974), or to consciously reflect upon language. Young children accustomed to learning language in environments rich with contextual clues rely heavily upon non-linguistic support for extracting meaning. They know what language is because of what it does (Halliday, 1975). When they come to school, they are faced with situations that require them to pay more attention to language. There is different contextual support for now 'the meaning is in the text' (Olson, 1977). That is, they must rely more heavily upon propositional content or what was said, rather than communicative intent or what was meant in many school tasks, particularly those related to literacy. If children are unfamiliar with this rather specialized use of language, they may have difficulty generalizing their albeit well-developed, but nevertheless context-embedded communicative competence to the school setting. By discovering the aspects of communicative interaction to which children attend, we can endeavor to assist them in becoming more effective participants across a wide range of contexts which will include the written as well as the oral mode. This study seeks to determine, by means of empirical investigation how young children learn to coordinate linguistic and contextual information in their understanding

of requests, offers, and questions.

## 1.2 OVERVIEW

Chapter Two discusses the theoretical background for the present study including an overview of the theory of speech acts. Past research on empirical verification of the standard theory of indirect speech acts is discussed together with a review of recent developmental work on speech act comprehension. Motivation for our developmental hypotheses is provided in a selective review of the literature on linguistic awareness.

Chapter Three reports on the first of two factorial experiments which contrasts pairs of predicted speech act interpretations. Requests and Offers were presented under different levels of quantity of propositional content using a discrimination task procedure. Chapter Four examines the results of the Request-Question contextual contrasts of Experiment II employing similar methods of presentation and the paraphrase judgment paradigm procedure.

Results of the two experiments are discussed in terms of our experimental hypotheses in Chapter Five. Finally on the basis of our results, some conclusions regarding a developmental shift in speech act processing strategies are drawn. Implications for further research and educational applications are considered.



CHAPTER TWO  
THEORETICAL AND DEVELOPMENTAL PERSPECTIVES ON SPEECH ACT  
COMPREHENSION

2.1 SPEECH ACT THEORY

A general discussion of speech acts was first introduced by Austin (1962) in which he described performative utterances. He claimed that each time a performative utterance is spoken under appropriate circumstances, acts are performed – (e.g., promises, advice, requests, warnings). Certain conditions, namely felicity conditions must be satisfied in order for the utterance to perform the acts in question. He further distinguished between three categories of acts performed in the utterance of a speech act:

1. Locutionary – performed in the utterance of a speech act (e.g., Uttering the words "Sit down!"). This includes the traditional semantic notion of reference.
2. Illocutionary – The intention of the speaker that the hearer recognize how the utterance is being used, i.e., what conventional acts are being performed (e.g., The hearer knows that he has been ordered to sit down.)
3. Perlocutionary – the effect of the act on the listener (e.g., The hearer sits down or refuses to sit down).

Searle (1969) expanded Austin's speech acts framework making further distinctions between utterance or locutionary acts (uttering words), propositional acts (referring and predicating ) illocutionary acts (the illocutionary force or

intention) and perlocutionary acts (effects on the hearer's beliefs and attitudes). These are not mutually exclusive, but contribute to the full description of what transpires in the performance of a speech act. The first three are necessarily included in any successful speech act. The intended perlocutionary effect, however, need not necessarily take place. Take, for example, the recalcitrant child who solemnly promises saying the words (utterance act), "I'll never do it again, mommy" after being caught in the act of some misdoing. Although his promise (illocutionary act) by means of predicating that he'll never do it again (propositional act) may be sincere, the effect of convincing his mother (perlocutionary act) is unlikely, given his past behaviour.

Further to his analysis of the kinds of speech acts, Searle developed a taxonomy of illocutionary act types. He claimed that any analysis of illocutionary acts needs to encompass both the intention to act and the knowledge of convention and the relation between them. To this end, he determined four types of conditions necessary and sufficient for the successful performance of an illocutionary act: propositional, preparatory, sincerity, and essential. Each illocutionary act type will differ from another in terms of one or more of these conditions. For the performance of a felicitious request to take place, for example, the following felicity conditions must be fulfilled:

Propositional content rule:

Future act(A) of hearer(H).

Preparatory rule:

H can do A. S believes H can do A. It is not obvious to both S and H that H will do A in the normal course of events of his own accord.

Sincerity rule:

S wants H to do A.

Essential rule:

Counts as an attempt to get H to do A.

For an offer, these felicity conditions are required:

Propositional content rule:

Future act(A) of hearer(H).

Preparatory rule:

H wants to do A. S is willing for H to do A.

Sincerity rule:

S can permit H to do A.

Essential rule:

Counts as an undertaking by S for A to occur.

A question requires these rules:

Propositional content rule:

Any proposition p.

Preparatory rule:

S does not know p (the answer).

Sincerity rule:

S wants to know p.

Essential rule:

Counts as an attempt to elicit this information

from H.

To what extent is the hearer's apprehension of these formal conditions psychologically functional in the comprehension of speech acts? Previous studies (Garvey, 1975; Leonard & Reid, 1979; Shatz, 1978; Reeder, 1980, 1981) have shown the significance of non-linguistic felicity conditions in the understanding of such speech acts as requests, questions, offers, assertions, arguments, congratulations, warnings, and thanks. The extent to which propositional content is used and how much is needed, however, has not been investigated. By systematically varying certain aspects of propositional content, it should be possible to empirically determine the validity of Searle's claim that propositional content is a necessary condition for speech act comprehension. This study will examine the relevance of the variable quantity of propositional content to understanding requests, questions, and offers.

## 2.2 THE COMPREHENSION OF INDIRECT SPEECH ACTS

An issue in the study of pragmatics which has received much attention is the comprehension of indirect speech acts. Directives, in particular, have afforded considerable insight into the phenomenon of understanding what is meant when the pragmatic intent is not a direct match to what is actually said. That is, the illocutionary force is not explicitly displayed in the form of the utterance. Employed

predominantly by adults and eventually by children, the use of indirect force is primarily motivated by reasons of politeness (Brown & Levinson, 1978; Clark & Schunk, 1980; Ervin-Tripp, 1976, 1977; Searle, 1975). In using a direct request such as "Sit down" the speaker presumes a certain status over the hearer whereas an indirect request such as "Would you like to sit down?" does not presume, and therefore allows or at least appears to allow options in inferring intent.

An important source of information available to the hearer is the conventionality of the utterance. Clark (1979) considers two types of convention. The first type, conventionality of means specifies a semantic device by which an indirect speech act can be performed. For example, a speaker can indirectly request a hearer to do some act by questioning the hearer's ability to perform the act. This would include utterances like "Can you sit down?" and "Are you able to sit down?". The second type, conventionality of form are considered conventional or idiomatic in the sense that certain forms in their usage as indirect requests have become standardized whereas other forms have not (Searle, 1979; Clark, 1979). The utterance "Can you sit down?" would be considered highly conventional, while it is possible "Are you able to sit down?" would not. Conventionality, however, is not constant across contexts (Clark & Schunk, 1980; Gibbs, 1981). An utterance such as "Can you sit down?" may typically be heard as a request, but a literal question

interpretation is equally plausible depending on the context in which it is uttered. The extent to which this theoretical distinction between conventionality and non-conventionality exists in actual performance, as well as the underlying processes involved in inferring is currently debated in the literature (Bach & Harnish, 1979; Clark, 1979; Gibbs, 1979, 1983; Searle, 1979). Given that conventionality is constrained by context, it is possible that the conveyed meaning of the utterance is determined by its context rather than by the conventional form of the utterance. Although recent studies have shown that children as well as adults can make contextually sensitive interpretations of both conventional and non-conventional indirect speech acts (Ackerman, 1978; Ervin-Tripp 1976), the question remains whether detailed attention to the linguistic component of the utterance is paid at the outset of this ability.

Searle claims that any explanation of indirect speech act comprehension must include not only a theory of speech acts, but mutually shared background information of participants (Clark and Carlson's [1981] 'intrinsic context') together with the hearer's inferential ability and Grice's (1975) general principles of conversation. The model suggested by this view, the serial or linear processing model, is composed of a four-stage process as conceptualized in Figure 1. First, the literal force of an utterance is computed (determined through its locutionary

Figure 1.

Linear Processing of Illocutionary Force

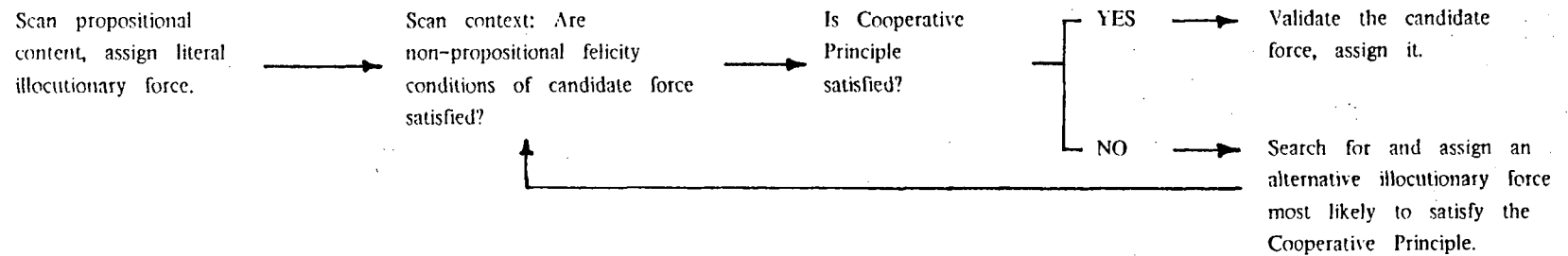
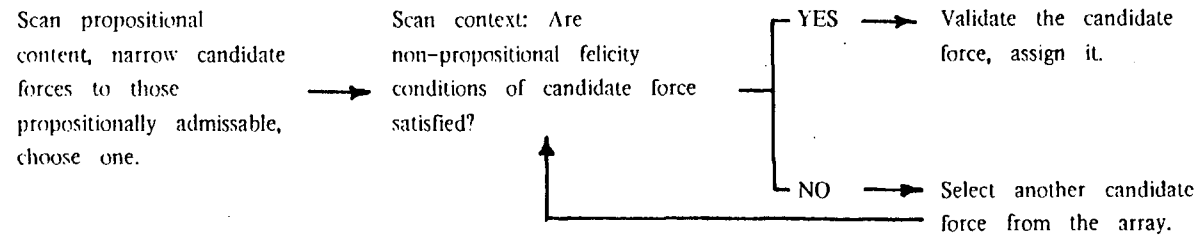


Figure 2.

Direct Processing of Illocutionary Force



meaning). Secondly, a test is made to determine whether literal meaning is compatible with various contextual (felicity) conditions and conversational rules (Grice's Conversational Principles). The Maxim of Relation, incorporated within one such principle, the Cooperative Principle, requires that a participant's contribution to the conversation will be relevant. Third, if a literal interpretation violates this maxim, then it is rejected and the indirect or conveyed meaning is calculated according to Gricean conventions. Finally, the utterance is interpreted on the basis of its inferred meaning. Inherent in this model is the assumption that computation of literal illocutionary force is an essential step in determining the conveyed force and that there is a direct relationship between the form and function (illocutionary force) of the utterance.

In an attempt to test this model, Clark and Lucy (1975) measured adult comprehension of indirect requests in a sentence verification task. They found evidence that their subjects did compute the literal force of the requests before the conveyed force. However, as Gibbs (1979) points out, the experiment was conducted in decontextualized settings where only linguistic information was controlled.

In a later study Clark (1979) observed the comprehension of ordinary or conventional requests for information such as "Do you know the time?". He concluded that computation of multiple illocutionary force occurred



for both conventional and non-conventional requests. However, he modified the previous model by proposing that although the literal force must be computed, there was no evidence that one occurred before the other, but rather they are computed simultaneously.

Following a characterization of speech acts similar to Searle's, using Conversational Presumptions (Searle's 'mutual contextual beliefs'), Bach and Harnish extended their analysis of speech acts to include non-literal indirect acts such as sarcasm, as well. They differ from Searle, however, in their treatment of conventional indirect requests. Searle states that all indirect speech acts are idiomatic (1975, p. 77). For those forms which have become conventionalized, literal force is still retained. Bach and Harnish propose that, for these cases, the process of inferring indirect intent by means of rejecting the literal intent is shortcircuited and the indirect force is directly inferred. This would appear to contradict the claim of the linear or the multiple meaning model that it is always necessary to compute the literal meaning in determining illocutionary force.

An alternative characterization of the comprehension of speech acts, the direct processing model (see Figure 2), suggests that consideration of literal illocutionary force is unnecessary although possible in the interpretation of an indirect speech act (Gazdar 1981). Reeder (1975) suggested a process whereby an illocutionary force which is compatible

with the appropriate propositional content is examined for satisfaction of its non-propositional felicity conditions in context. If these conditions for a candidate interpretation are not satisfied, an alternative force is considered.

Experimental work which supports the direct processing model was conducted by Gibbs (1979) where, by means of a paraphrase judgment task he tested understanding of indirect requests both in and out of context. Target sentences such as "Must you open the window" which can function literally as a question "Need you open the window?" or indirectly as a request "Don't open the window" were presented to subjects either within a story context or in isolation. Paraphrases consisted of either the literal or conveyed interpretation which were judged correct in each situation. The results confirmed that linear strategies were employed for processing indirect force without context. However, when the sentences occurred within context both the indirect and the literal meaning were understood equally as quickly. Gibbs suggests that an additional step of processing literal meaning is unnecessary in a model of speech act comprehension, lending credence to the direct processing proposal.

In a similar experiment investigating the effect of conventionality and context on comprehension of indirect requests, Gibbs (1981) found evidence that conventional indirect requests like "Can you pass the salt?" took less time to comprehend than such non-conventional requests as

"Is it possible for you to pass the salt?" as did Clark (1979) and Clark and Schunk (1980). He suggests rather than considering these as separate categories, the differences between conventionality and non-conventionality is a matter of degree determined by context and relationships between participants.

Indirect speech acts and the degree of conventionality are primarily motivated by practical reasoning premises, the most important of which is preservation of face by means of politeness (Brown & Levinson, 1978). Brown and Levinson in their theory of politeness propose that this desire to give attention to face causes a speaker to deviate from the normal efficiency of cooperative principles and invites the hearer to assume conversational implicature. In order to reduce the risk of a face-threatening act, a speaker employs various face-saving strategies of politeness, formality, and indirectness. These hierarchical strategies are determined by the mutually assumed social variables of distance and power between the speaker and the hearer and the relative rank of the imposition of the face-threatening act selected in the context. The more risk involved in a face-threatening act or the higher the 'cost' factor, the more likely a higher order strategy will be employed.

It is evident that several issues need to be resolved in both refining theoretical claims as well as testing their validity in empirical studies. Furthermore, there is a need to study the kinds of developmental processes which young

children employ in their understanding of indirect speech acts.

### 2.3 DEVELOPMENTAL STUDIES OF SPEECH ACTS

Much of the recent literature which has attended to child language in terms of speech act analysis has focussed on productive competence in naturalistic settings (Dore, 1977; Ervin-Tripp, 1977; Garvey, 1975; Halliday, 1975; Shatz, 1978a; Wells, 1981). In her analysis of preschool children's ability to use requests in spontaneous speech, Garvey (1975) found evidence that children did pay attention to the felicity conditions pertaining to requests. Dore (1979), based on his observations of children's responses to questions, specified as a necessary condition the presence of complete and accurate propositional content. Children's spontaneous responses, however, do not constitute sufficient evidence to determine the extent to which propositional content is considered in their understanding of illocutionary force. It may well be that other non-linguistic information is serving as a cue for them to respond appropriately.

In order to control for these extraneous variables, several researchers have attempted to study speech act comprehension under controlled experimental conditions (Ackerman, 1978; Ervin-Tripp & Gordon (in press); Shatz, 1978b; Reeder 1980, 1981). Judgments of utterance appropriateness as defined by relevance to context for seven

different speech acts were examined in three to six year-olds by Leonard and Reid (1979). The younger children relied heavily on non-linguistic contextual evidence which supported their notions of relevance and politeness as a basis for judging appropriateness. By age six, however, children's judgments approximated that of adults.

Shatz (1978b) in an experimental study of even younger subjects, found evidence of two year olds' ability to take linguistic context into account. Her subjects were presented with a set of test sentences in three situations, a neutral, directive, and informational context. Although action responses predominated in both the directive and the more ambiguous neutral contexts, the children produced more informing responses in the informational context. Based on this study and earlier observational data of two-year-olds' comprehension of their mothers' requests (1978a) Shatz postulated that the children were operating on the basis of some simple discourse rule where they responded with action to some salient aspect of the speech addressed to them unless there was some kind of stop-action marker (linguistic or contextual) that signalled doing otherwise. There appeared to be a bias, however, towards an action response regardless of propositional and contextual information. She suggested further that acquisition of these markers is facilitated by the child's participation in language learning routines such as 'peekaboo' and storybook reading (cf. Bruner, 1983; Snow, 1983).

Reeder (1980, 1981) found that children as young as two and one-half years were able to discriminate amongst requests, questions and offers. Using a paraphrase judgment task paradigm, he asked his subjects to choose the response which most closely matched a stimulus utterance of the form "Would you like to do A?" presented in each of the three contexts. Verification of a predicted speech act was determined by falsifying alternative interpretations on the basis of context. The predicted paraphrase for the requests was "I want you to do A", for the offers "I'll let you do A" and for the questions "Do you want to do A?". Reeder (1980) proposed that three components may have contributed to illocutionary competence:

1. knowledge of propositional felicity conditions upon illocutionary acts: what can be said in order to perform a request or an offer;
2. knowledge of pragmatic felicity conditions upon illocutionary acts: in what circumstances it can be said appropriately;
3. general inferential skills which can act upon information about contexts and assumptions about conversational participants (p. 24).

He concluded that his subjects were able to infer the appropriate illocutionary force using both contextual and propositional content information. Nevertheless, he noted that it was possible that his subjects were responding solely to non-linguistic contextual cues perhaps without

even considering propositional content (cf. Shatz 1983).

Most of the studies of children's understandings of directives have focussed on conventional requests. Ackerman (1978) in a study of older children's judgments of the appropriateness of unconventional forms discovered that although his subjects showed some sensitivity to context, an action response bias was still evident at the third grade. Furthermore, conventionality did not appear to facilitate understanding of indirect intent (cf. Gibbs' [1981] results with adults).

An investigation by Hildyard (1979, unpublished) found that older children's recall of requests was affected more by the status of the speaker and the social context (i.e., right or favour) than the form of the utterance. Although verbatim recall of conventional requests was the least accurate, they tended to be recalled in a related conventional form.

Other researchers have demonstrated that young children are able to take into account some aspects of the social variables of power, distance, and rank (Bates, 1976; Ervin-Tripp, 1977; Ervin-Tripp & Gordon, [in press]; S. James, 1978). James (1978) in a study of politeness of children's directives as a function of listener age, found that the most polite directives were addressed to the adult listener, followed by the peer and younger child. Bates (1976) claims that by age three, a general concept of politeness is acquired in terms of age of addressee but that

different polite forms are successfully discriminated at different ages.

The studies cited above indicate that young children are capable of adjusting their responses appropriately to the underlying intentions of an utterance using non-linguistic felicity conditions, but there is inconclusive evidence that their early response strategies are based on an analysis of of linguistic form and propositional content. It appears, then that pragmatic competence develops relatively early in young children. This is not surprising in light of the fact that children learn to communicate in environments rich with contextual cues, generally making redundant additional linguistic information. It does not follow necessarily that children acquire linguistic structures as a consequence of their ability to infer pragmatic intent. Rather, there seems to be a conflation of knowledge of form and function (Halliday, 1975) which gradually becomes differentiated with children's growing awareness that language can be considered outside its communicative context.

#### 2.4 THE DEVELOPMENT OF LINGUISTIC AWARENESS

Although considerable variation occurs in the emergence and degree of linguistic awareness, there is evidence of a developmental progression with the earliest signs appearing around age two, continuing well into the school years (Clark, 1978). In studies of linguistic awareness in



children aged four and above, researchers have found that linguistic awareness increases with age and linguistic experience (Gleitman et al., 1972; Hakes, 1980).

There is some suggestion that younger children are using their 'knowledge of the world' rather than 'knowledge of language' as the basis of their judgments of acceptability (Carr, 1979; Hildyard & Olson, 1982). Hildyard and Olson (1982) interpreted their findings as evidence that at the earliest stage, children process linguistic meaning in terms of their contextual and illocutionary knowledge (i.e., casual or context-embedded meaning). Later the child learns to attend to propositional content as a means of mapping contexts into particular meanings. Finally, the child is able to create context (or 'stipulate possible worlds') on the basis of the propositional content of an utterance (its literal meaning). They argue further that this ability develops concurrently with and is fostered by the acquisition of literacy. In the form of written texts, language assumes a different kind of importance from its use in normal discourse.

Language can be used as a tool to represent possible or even hypothetical worlds. Familiarity with this specialized use of language appears to be highly correlated to success in school (Wells, 1981). Many school-related tasks, such as mathematics and science, which employ abstract formal representations of rules require the ability to disembed language from conversational contexts (Donaldson, 1978).

## 2.5 RATIONALE OF THE STUDY

Previous studies of speech act comprehension have shown that young children are capable of taking propositional content into account when determining the pragmatic intent of an utterance. The extent to which it is necessary, however, has not been investigated. This study addresses the question of the amount or the quantity of propositional content required for discrimination between Requests and Offers and Requests and Questions. There is some evidence cited above that children's early sensitivity to context is somewhat independent of their ability to take into account linguistic form and propositional content.

Also of interest is the question of the degree to which these children take into account a literal interpretation of a speech act in order to infer its indirect meaning. According to some speech act theorists, the processing of literal meaning is necessary in inferring indirect intent (as discussed in detail above, sec 2.2). However, Gibbs' experimental research with adults indicates that the indirect meaning may be inferred without processing the literal meaning given adequate context. To what extent do young children take into account a "literal" interpretation of a speech act in order to infer its indirect meaning?

As children acquire the conventions of literacy and other abstract school-learning tasks, they must learn to suppress their early ability to derive meaning from non-linguistic contextual information and increasingly rely

on language-based strategies to extract meaning. It was hypothesized that younger children would initially employ direct processing strategies in determining illocutionary force using non-propositional contextual cues. Older children, however, would be more linear in their approach, relying more heavily upon propositional information.

Chapters Three and Four describe two factorial experiments which examined the effects of age and quantity of propositional content on young children's discrimination amongst requests, offers, and questions.

## CHAPTER THREE

### EXPERIMENT I - REQUESTS AND OFFERS

In Experiment I, subjects were administered a discrimination task where constructed contexts for stimulus utterances were presented using a procedure similar to the one employed by Reeder (1981). To address the question of the extent to which young children are dependent upon linguistic information in determining illocutionary force it was decided to vary systematically the amount of propositional content available in the stimulus utterance Would you like to do A? A pair of physical contrasts was constructed, one of which supported a request interpretation of the stimulus utterance paraphrased by I want you to do A and the other a putative offer interpretation of I'll let you do A where A refers to some act.

#### 3.1 EXPERIMENTAL HYPOTHESES

The following experimental hypotheses were proposed:

- H<sub>1</sub> A significant predicted response effect will be demonstrated when comparing predicted vs. non-predicted responses. Subjects will be able to differentiate reliably between the two contextual conditions and will select the predicted paraphrases I want you to do A in the Request condition and I'll let you do A in the Offer condition.
- H<sub>2</sub> QUANTITY - A main effect of quantity will be found in both contextual conditions. Subjects in the

reduced quantity levels will be less able to differentiate between requests and offers.

- H<sub>3</sub> AGE – A main effect of age is predicted across quantity and contextual levels. Older subjects will discriminate less reliably than younger subjects.
- H<sub>4</sub> AGE x CONTEXT – Offers are more likely to be reliably discriminated than Requests by younger subjects (cf. Reeder, 1981).
- H<sub>5</sub> AGE x QUANTITY – Lower levels (NP, Distorted) of quantity of propositional content will be accepted by younger children.

### 3.2 METHOD

#### 3.2.1 DESIGN

A 2 x 3 x 2 (AGE x QUANTITY x CONTEXT) mixed factorial experiment with repeated measures on the contextual factor was designed. Using a paraphrase judgment task paradigm, a pair of predicted speech act contexts were contrasted. Three and four-year-old children's discrimination of requests and offers as a function of quantity of propositional content available in the stimulus items was measured. The quantity of propositional content was systematically reduced from a full interrogative utterance to a truncated final object noun phrase to an acoustically distorted form of the full interrogative.

Children in each age group (3, 4) were randomly assigned to one of three quantity levels (Full, NP, Distorted). Within each level of quantity ( $n = 9$ ), subjects were exposed to six trials of each level of context (Request, Offer) for a total of twelve trials per subject. A summary of the design appears in Table 1 below:

### 3.2.2 SUBJECTS

Twenty-seven three-year-old and twenty-seven four-year-old children ( $N = 54$ ) were randomly selected from the toddler and preschool classes at the Child Study Centre, University of British Columbia. The population of the Centre is drawn relatively equally from families of university faculty and staff, students, and the local community. The three-year-old group ranged in age from 2;0 to 3;7 with a mean age of 3;3 years and the four-year-old group ranged from 3;7 – 5;0 with a mean age 4;4 years. Previous investigation (Reeder, 1975) indicated that children much below the age of two and one-half years and beyond age five years would be unable to perform the discrimination task (as presently constituted) because of immature or advanced cognitive development. Children for whom English was a recent additional language and children who appeared to have learning and/or adjustment problems were excluded from the sample. Identification of these children had been previously obtained by means of a teacher questionnaire and school records. Participation was

Table 1. Factorial Design with subjects in each age group randomly assigned to the quantity factor and with repeated measures on the contextual factor

| AGE | QUANTITY  | CONTEXT          |
|-----|-----------|------------------|
| 3   | Full      | Request<br>Offer |
|     | NP        |                  |
|     | Distorted |                  |
| 4   | Full      |                  |
|     | NP        |                  |
|     | Distorted |                  |

voluntary and no child refused to do the task.

### 3.2.3 CONTEXT

The current study replicated the overall procedures for the selection and administration of the two contrasting situations described in Reeder (1981). The contextual contrast was presented using a speaker (S) teacher puppet and a hearer (H) child puppet in a preschool setting. Each contextual condition was conveyed by simple physical cues, namely, proximity of the speaker and hearer to the respective plaything. A stimulus item was presented once under each level of context. Presentation order of the contextual condition was randomized across the twelve trials

to control for any order effect and to make attributable any main effect of context to the contrasting situation.

Discrimination of the contextual contrast was measured by a forced choice from the pair below, of the response alternative that best matched the pragmatic intent of the original stimulus item. Predicted responses for each context were as follows:

Request: I want you to do A

Offer: I'll let you do A.

#### 3.2.4 QUANTITY

The amount of propositional content available in the stimulus items was varied at three levels exemplified in the forms below:

Full interrogative: Would you like to play on the train?

Object Noun Phrase(NP): the train?

Distorted: *Would you like to play on the train?* (a version of the full stimulus form acoustically transformed by means of spectral inversion.)<sup>1</sup>

Reliable differences between levels of the quantity variable had previously been observed in pilot trials where the age variable was controlled by testing only four-year-olds. Subjects in the reduced quantity levels

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<sup>1</sup> A technique developed by Andre-Pierre Benguerel, School of Audiology and Speech Sciences, University of British Columbia, which keeps suprasegmental parameters intact, distorting only segmental phonology. The acoustic wave form is inverted around an axis of 2100Hz, the effect of which is a change in place of articulation. The result is an acoustically distorted yet decidedly language-like utterance.



discriminated less reliably than those in the Full condition.

Within each quantity level stimulus items differed from one another only with regard to lexical items referring to the playthings in the constructed context.

### 3.2.5 MATERIALS

#### 3.2.5.1 Physical Setting

An indoor/outdoor model preschool setting situated on a small low table remained constant throughout practice and test sessions. The four classroom activity centres - the blocks, books, sandtable, and art table were separated from the four pieces of outdoor playground equipment - the bike, horse, train, and slide, by a cardboard divider. Movement back and forth from the indoor activity centres to the outdoor playground was managed by simply rotating the turntable on which these materials were placed. An analysis of previous pilot work revealed no systematic differences between the indoor and outdoor experimental materials. The variety was used simply to further engage the child's interest in the task. Fisher-Price 'Little People' puppets were used to represent the speaker (S) and hearers (H). S, who remained constant in both contextual conditions was a readily identified 'teacher' puppet whereas H was represented by five different 'pupil' puppets varied randomly across all task trials.

Position of S, H, and P was marked by different coloured stickers attached to the turntable in both the indoor and outdoor settings.

#### 3.2.5.2 The Request Context

In the Request condition, the teacher, S, stood beside the target plaything referred to in the subsequent discrimination task item while one of the pupil puppets, H, was placed at a distance of 10 - 12 cm as in Figure 3. Arrows indicate direction of gaze or 'lines of regard'. The teacher's location beside the plaything (P) was designed to display a salient sincerity condition for requests, that S wants H to do A.

#### 3.2.5.3 The Offer Context

In the Offer condition, S's and H's positions were reversed with H directly facing P as in Figure 4. Here it was assumed that H's location beside P would support a salient sincerity condition on offers, that H wants to do A.

#### 3.2.5.4 Discrimination task stimulus items

Stimulus items consisted of six items for each contextual and quantity level. Four indoor and four outdoor variants including practice items were used (see Appendix A). The six items per level of context were presented in randomized order for context and indoor/outdoor variants on pre-recorded tapes as shown

Figure 3.  
Constructed Context, REQUEST Condition

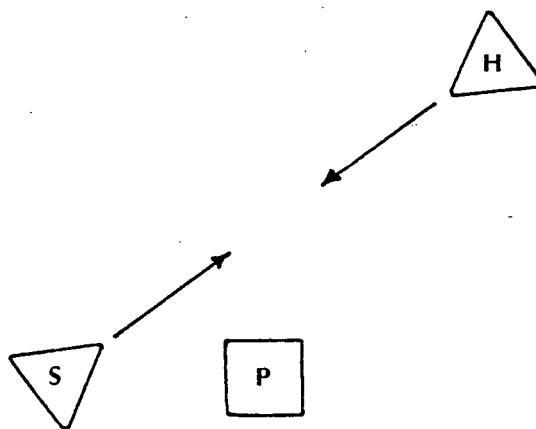


Figure 4.  
Constructed Context, OFFER Condition

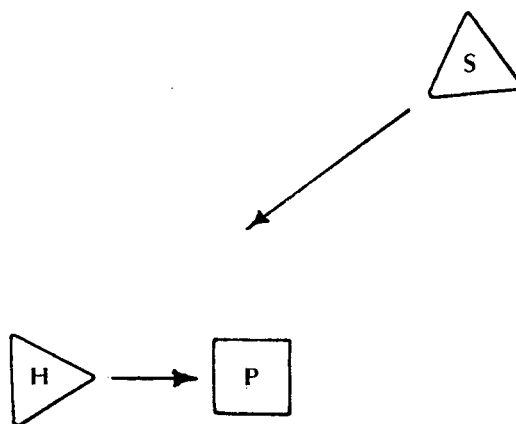


Table 2. Order of Discrimination Task Items

| ITEM | CONTENT   | CONTEXT | BUTTON<br>POSITION |
|------|-----------|---------|--------------------|
| P3.  | bike      | Request | R                  |
| P4.  | picture   | Offer   | L                  |
| 1.   | books     | Offer   | R                  |
| 2.   | train     | Request | L                  |
| 3.   | horse     | Request | R                  |
| 4.   | slide     | Offer   | L                  |
| 5.   | sandtable | Request | L                  |
| 6.   | blocks    | Offer   | L                  |
| 7.   | sandtable | Offer   | R                  |
| 8.   | slide     | Request | R                  |
| 9.   | books     | Request | L                  |
| 10.  | train     | Offer   | R                  |
| 11.  | blocks    | Request | R                  |
| 12.  | horse     | Offer   | L                  |

in Table 2. The same order for each quantity level was maintained.

### 3.2.5.5 Discrimination task response items

Six pairs of contrasting paraphrases corresponding to the lexical referents in the stimulus items were constructed as response alternatives. Each pair consisted of a Request-Offer contrast:

I want you to do A

I'll let you do A.

These were dubbed onto separate tracks of a tape with left and right channel assignment randomized for all twelve items in order to assure that any contextual effect could not be attributed to a perseverative left or right button position bias. Order of lexical

referents in the response items followed the randomization scheme for the stimulus items (see Table 2).

All stimulus and response items were recorded by an adult female native speaker, who was also a trained teacher, under studio conditions. Potential effects of terminal intonation contour were controlled for by using a mid-fall terminal contour throughout for both stimulus and response items. The complete discrimination task battery is contained in Appendix A.

#### 3.2.5.6 Equipment

Two portable cassette players were employed to present the stimulus items and the response items. In order to minimize potential distraction from ambient noise, headphones were worn by both experimenter and subject. A push button selector switch was used by the subject to activate the tracks of tape for the discrimination task's response items. Each response item was copied 6 - 8 times allowing the subject to hear either alternative form again in any order if needed, by pressing each button.

#### 3.2.6 PROCEDURE

##### 3.2.6.1 Practice Trials

Prior to actual testing, practice sessions were held to allow the children to become acquainted with the

experimenter, test materials, and equipment, as well as the discrimination task procedure. Children were seen individually in a quiet corner of their classroom during a free play activity time. Four practice items were administered. The first practice item (P1), occurred outdoors with the teacher, previously identified, beside the bike. The subject was directed to "Listen to what the teacher says" before the stimulus item was played. A probe in the form of "What did the teacher say?" was administered at this time to determine whether the child had the necessary information to proceed with the discrimination task. A verbal repetition of the stimulus item the bike or simply pointing to the bike was taken as evidence of understanding. The discrimination task item consisted of a pair of contrasting lexical items (the bike / the slide). The subject was instructed to press each button and find "Which button says what the teacher said".

Practice item two (P2) repeated the routine of P1 substituting an indoor variant for the lexical items (the picture / the blocks) and using an alternative button assignment from P1 to avoid a possible perseverative effect.

Practice items three and four (P3, P4) introduced both the contextual and the quantity conditions. The same referents for the indoor and outdoor variants of P1 and P2 were employed. Level of exposure to quantity was

previously determined by random assignment of subjects within each age group to one of three levels (Full, NP, Distorted). After establishing that one of the pupil puppets needed to choose an activity, the Request condition was presented for P3. The teacher puppet was standing beside the bike and the pupil addressee was positioned at a distance of 10 - 12 cm away on a premarked spot (see Figure 3). Probes were made to ascertain whether the subject had perceived the difference in positions of the S and H and the inference entailed using the following questions: "Where is the teacher?", "Where is the boy/girl?" and "What does the teacher want?". Either verbal responses such as "She wants him to play on the bike" or non-verbal touching or pointing responses to the appropriate referent were considered sufficient.

Upon acquisition of the essential features of the Request context, each subject was exposed to the appropriate level of quantity for the stimulus item. The three levels of quantity for Practice stimulus item three (PS3) were as follows:

Full: Would you like to play on the bike?

Noun Phrase (NP): the bike?

Distorted: *Would you like to play on the bike?*

(acoustically transformed)

The subject was then instructed to "Find the button the teacher just said" by pressing each of the two buttons.



Discrimination task alternatives were the same for all subjects. Practice discrimination item three (PD3) is exemplified below.

I want you to play on the bike.

I'll let you play on the bike.

Both stimulus and discrimination task responses could be played repeatedly if necessary.

For P4, the teacher puppet was positioned about 10 - 12 cm away from the art table and the pupil puppet, who was beside the art table. Again, as in the Request context, positions for placement were premarked for the Offer context (Figure 4). Understanding of speaker and hearer position and the critical inference was probed by asking "Where is the boy/girl? Where is the teacher? What does the boy/girl want to do?" Responses indicating the appropriate referent were considered acceptable. Presentation of the discrimination task was the same as for P3. To minimize button position perseveration, task items were reversed from P3.

If criterion of correct performance for P1 - P4 was not met, a subsequent screening of non-linguistic discrimination ability was administered. Using a matching paradigm with attribute blocks, each subject was required to make three successive discriminations. For those subjects unable to meet this criterion, further testing was postponed.

### 3.2.6.2 Test Sessions

The Discrimination Task. Test sessions were administered on a separate day from the practice sessions. Items P3 and P4 were readministered as practice trials followed by the 12 discrimination task trials in one or two sittings, depending on the attention span of the child. A session lasted no longer than 15 minutes. Presentation of the 12 trials differed from the practice trials in two ways. First, probes were eliminated, since acquisition of the critical contextual features had been previously demonstrated. Secondly, after initial familiarization with the task, manipulation of the puppets was managed by the subjects in an effort to maintain their involvement and interest in the testing session. All of the subjects clearly understood the task and were reminded throughout the 12 trials that "what the teacher said" could occur on either button as evidenced in the practice trials. Stimulus items and their corresponding response alternatives were administered in randomized order for context and indoor/outdoor variants as shown in Table 2.

The Elicited Imitation Task. Following the discrimination task, the Full versions of the stimulus items for P3 and P4 were presented in their respective contexts to all subjects. Subjects were asked to "Say what the teacher said" after each item. This task was administered in a separate session one week following

the discrimination task in order to avoid possible contamination by exposure to the full form for those subjects who had been assigned to the reduced levels of the quantity variable. The purpose of including this task was to examine the extent to which propositional content of the stimulus utterance was retained or altered.

### 3.2.7 CODING AND ANALYSIS

Raw responses were coded as left or right button selections. The 12 left-right responses for each subject were converted into numerical scores out of six for each paraphrase form for both predicted and non-predicted responses under each contextual condition where 1 = predicted choice and 0 = unpredicted choice. Two three-way analyses of variance with repeated measures on context were performed on the results of the discrimination task in order to test the null hypotheses corresponding to each experimental hypothesis. In addition, any spontaneous verbal and non-verbal responses were transcribed and informally analyzed as was the elicited imitation task.

### 3.3 RESULTS

Discrimination Task. Mean responses for the six trials in each contextual condition administered to each age group under each quantity level are summarized in Table 3. Predicted or 'correct' response means (**bold-face**) are

Table 3. Discrimination Task Means - Request/Offer Contrast

| AGE | RESPONSE ALTERNATIVE | QUANTITY    | CONTEXT |       |
|-----|----------------------|-------------|---------|-------|
|     |                      |             | Request | Offer |
| 3   | I want you to do A   | Full        | 4.00    | 1.44  |
|     |                      | Noun Phrase | 3.67    | 2.33  |
|     |                      | Distorted   | 3.89    | 1.56  |
|     | I'll let you do A    | Full        | 2.00    | 4.56  |
|     |                      | Noun Phrase | 2.33    | 3.67  |
|     |                      | Distorted   | 2.11    | 4.44  |
| 4   | I want you to do A   | Full        | 4.44    | 2.33  |
|     |                      | Noun Phrase | 3.44    | 3.44  |
|     |                      | Distorted   | 2.56    | 3.56  |
|     | I'll let you do A    | Full        | 1.56    | 3.67  |
|     |                      | Noun Phrase | 2.56    | 2.56  |
|     |                      | Distorted   | 3.44    | 2.44  |

contrasted with non-predicted or 'incorrect' response means under each contextual condition. In order to determine whether there was an overall effect of predicted response in the discrimination test of 12 items, a three-way repeated measures analysis of variance comparing predicted and non-predicted (or correct vs. incorrect) responses in each context was conducted. A highly significant main effect of predicted responses ( $F = 24.34 (1, 48)$ ,  $p = .0000$ ) indicated all subjects were discriminating reliably in both the Request and Offer tasks.

A second three-way analysis of variance with repeated measures (age x quantity x context) was performed on the predicted (correct vs. correct) means for each response alternative (see Table 1; **bold vs. bold**). The analysis is summarized in Appendix B. The results of this analysis revealed two significant main effects. First, age ( $F = 11.82 (1, 48)$ ,  $p = .001$ ), where three-year-olds were discriminating pragmatic intent more reliably or 'correctly' than four-year-olds across both contexts and all quantity levels. Second, quantity ( $F = 5.03 (2, 48)$ ,  $p = .01$ ), whereby discrimination performance for both age groups was depressed in the two reduced quantity levels (NP and Distorted), compared to their performance in the Full level. No significant main effect for context was found.

An age by quantity interaction approaching statistical significance, ( $F = 2.97, (2, 48)$ ,  $p = .06$ ) is shown in Figure 5. Note that the three-year-olds' performance drops

Figure 5  
Mean number of predicted responses of 3 and 4-year-olds  
as a function of QUANTITY, Experiment I.

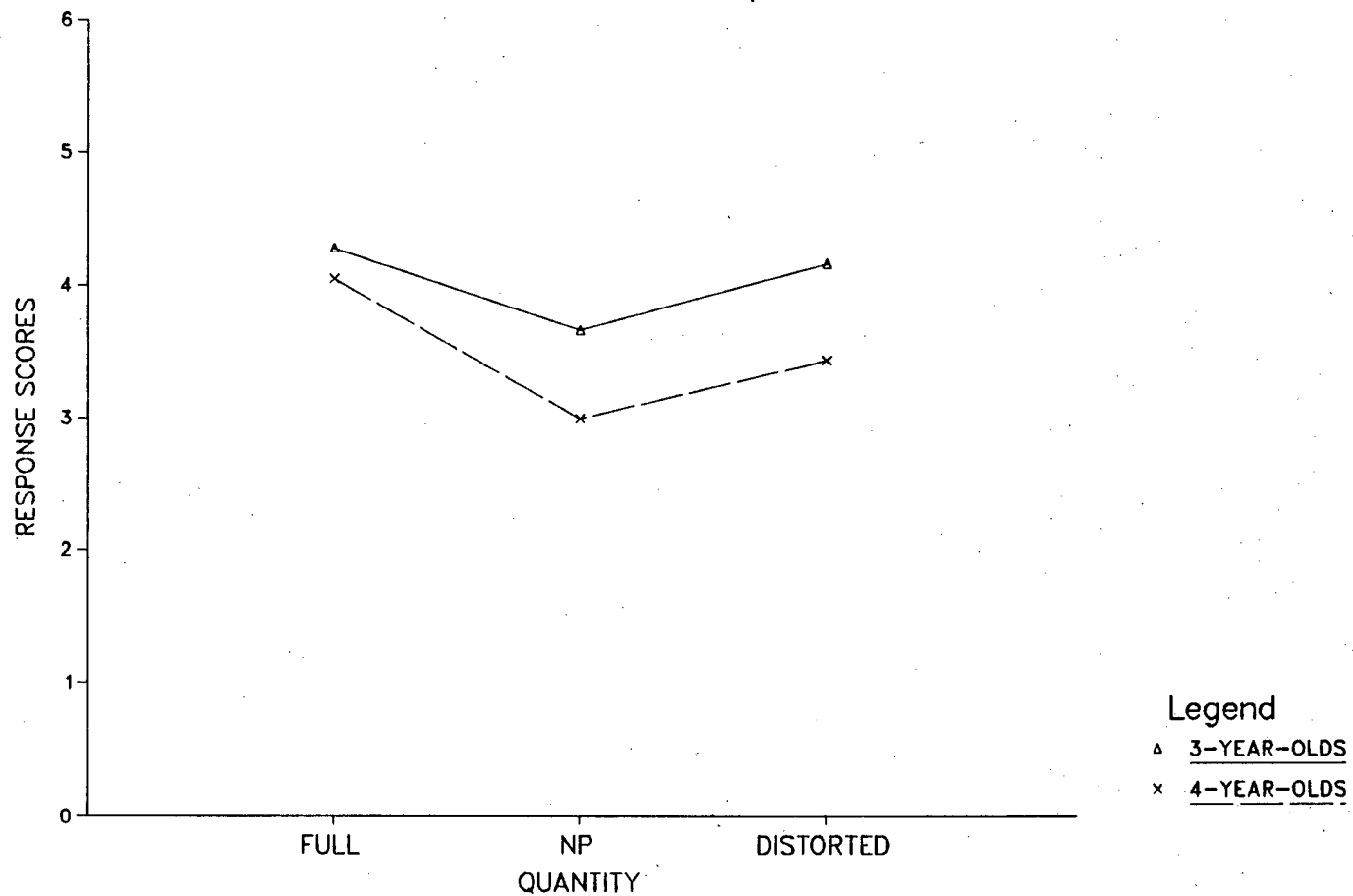
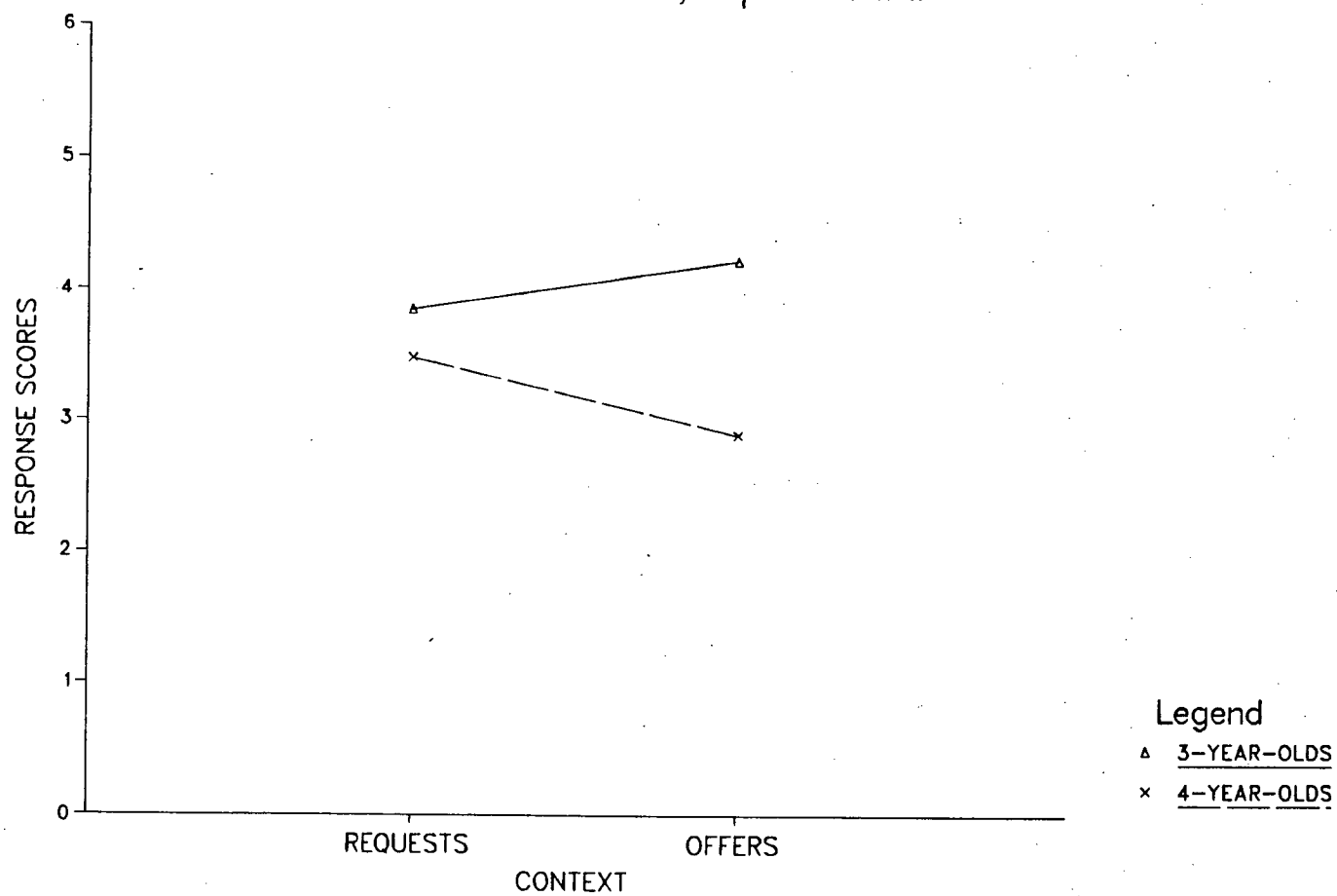


Figure 6  
Mean number of predicted responses of 3 and 4-year-olds  
as a function of CONTEXT, Experiment I.



slightly in the NP condition only, whereas the four-year-olds' performance is significantly depressed in both of the reduced quantity levels. When a subsidiary analysis of variance was conducted without the NP level, however, an interaction was found ( $F = 7.41$ , (2, 48),  $p = .01$ ), and a Scheffé test suggested that the three-year-olds' advantage was in the Distorted condition ( $F = 14.70$ , (3, 32),  $p < .01$ ).

Figure 6 illustrates an interaction between age and context ( $F = 4.78$  (1, 48),  $p = .03$ ). A Scheffé comparison confirmed that the four-year-olds' performance was inferior to the three-year-olds' in the Offer context ( $F = 13.92$  (3, 50),  $p < .01$ ). The three-year-olds' discrimination of offers, although appearing better than that of requests, was not significantly different.

### 3.4 DISCUSSION

The main effect of predicted response which was hypothesized in  $H_1$ , was found to be significant in the expected direction. That is, predicted responses for each context were chosen significantly more often than non-predicted responses. These results are consistent with previous studies by Reeder (1980, 1981) which showed highly reliable performance on the discrimination task indicating that young children are indeed able to use contextual cues in such a way as to represent non-propositional felicity conditions in determining illocutionary force. We need to look further to



determine whether linguistic-propositional information facilitates their understanding.

The second hypothesis, which predicted that children receiving reduced levels of quantity of propositional content would discriminate less reliably than their counterparts in the Full condition was also supported. It would appear that children do take linguistic information into account in their understanding of illocutionary force. A closer look, however, at the main effect of age and the interactions of age with quantity and context suggests that the propositional content of a speech act may not be a necessary component in comprehension, at least for our younger subjects.

The prediction in H<sub>3</sub> that older children would demonstrate a less reliable performance on the discrimination task than their younger counterparts was strongly supported. From a developmental perspective, this would seem counter-intuitive if we were to assume that speech act comprehension improves with increased age towards an adult level of competence in a simple linear fashion. There appears to be, then, an interaction with some other elements that is causing the four-year-olds' depressed performance on the discrimination task. Evidence for this is found in the two interactions. First, in the age x quantity (Figure 5) interaction, four-year-olds were adversely affected by a reduction in the quantity of linguistic information whereas the three-year-olds were

generally impervious to the reduced information, particularly in the Distorted condition. The second source of difficulty for the four-year-olds appears in the Offer context. The three-year-olds, on the other hand, maintained their good performance across contexts. The reason for this is perhaps attributable to experience as noted by Reeder (1981). His younger subjects were decidedly more proficient at offers than requests whereas his older subjects performed equally well in both contexts. He suggested that because of the younger children's relative dependence upon caregivers for assistance, it might be expected that more offers would be addressed to them than requests whereas the increasing independence of the older children would allow them to carry out more requests. The age range in the present study encompasses both of the age groups examined by Reeder and thus could account for the sustained performance of the younger children across both contexts. However, this does not explain the unexpectedly poor performance of the four-year-olds in the Offer context. A possibility is that the four-year-olds are becoming more aware of the one - many relations between any linguistic form and its potential illocutionary forces and consequently, are less sure in their judgments of intention.

Some support for this explanation is gleaned from the spontaneous response data. One subject, assigned to the Full condition, responded after a stimulus item was played in the Request context "She means you can play on the slide"

and chose the predicted Offer response alternative. In the following trial, this time in the Offer context, she paraphrased the stimulus as "You can play on the slide" but chose the Request alternative. In another trial, she commented that "'Would you like to'" means "'I'll let you'" but chose correctly the Request response alternative. For the older subjects in the reduced quantity levels, comments like "I'm not sure"; "I don't know 'cuz the teacher said it loudly"; "Like the funny one?" were not uncommon after being asked by the experimenter to select one of the response alternatives. An exception was one four-year-old who confidently stated throughout all task trials "I'm always right" although he rarely was. In fact, he was one of the subjects who used a 'one button' strategy. Six children of the 18 four-year-olds in the reduced quantity levels resorted to a strategy of consistently choosing one button when they were unable to make their judgments on the basis of complete linguistic information. As mentioned earlier, all of the subjects clearly understood the task. In contrast, only one of the younger subjects followed this strategy. Indeed, the three-year-olds appeared unaffected by the reduction of propositional content and appeared quite confident in their choices. Obviously this data does not provide conclusive evidence for the consideration of force multiplicity by the older children. Nevertheless, it is a plausible explanation.

Elicited Imitation Task. Finally, in the elicited imitation task, 43 of the 54 imitations by the four-year-olds were completely accurate. Three imitations were reduced to a verb phrase (e.g. "play on the bike"). In comparison, 22 of the 54 imitations by the three-year-olds were verbatim; 6 imitations were reduced to a verb phrase and 13 were reduced to a noun or noun phrase (e.g., "the bike" or "bike") . This data supports the hypothesis that older children are able and/or more likely to pay attention to the formal aspects of language in terms of syntactic and semantic details whereas the younger children were less likely to do so, relying more heavily on non-linguistic contextual information.

Thus, we can tentatively conclude that three-year-olds are able to use other non-linguistic contextual cues in the absence of good linguistic information in their discrimination of requests and offers.

## CHAPTER FOUR

### EXPERIMENT II - REQUESTS AND QUESTIONS

The results from Experiment I indicate that although the propositional content of an utterance was helpful in determining the illocutionary force of requests and offers, it did not appear to be necessary. To examine the generality of these findings to an additional pair of speech acts, a replication of Experiment I was conducted substituting an alternative level of context for the Offer condition. In Experiment II, the contextual contrasts between a Request interpretation of the Full and reduced forms of Would you like to do A? paraphrased by I want you to do A and a Question interpretation of the same forms, paraphrased by Do you want to do A? were presented. Experiment II also addresses the question of the extent to which children employ the literal meaning of an indirect speech act en route to inferring its conversationally conveyed meaning.

#### 4.1 EXPERIMENTAL HYPOTHESES

As in Experiment I, it was hypothesized:

H<sub>1</sub>' A main effect of predicted response was expected when comparing predicted and non-predicted responses with subjects choosing I want you to do A in the Request condition and Do you want to do A? in the Question condition significantly more often than chance.

H<sub>2</sub>' QUANTITY - A main effect of quantity was predicted where NP and Distorted levels would demonstrate less reliable discrimination than Full levels in both contextual conditions.

H<sub>3</sub>' AGE - A main effect of age was expected with younger subjects discriminating more reliably than older subjects.

H<sub>4</sub>' AGE X CONTEXT - Questions would be more likely to be reliably discriminated from Requests by older subjects.

H<sub>5</sub>' AGE X QUANTITY - Lower levels of quantity would be accepted in the discrimination task by younger children.

## 4.2 METHOD

### 4.2.1 DESIGN

A second factorial experiment was conducted using the same design for Experiment I (see Table 1), but with an alternative level of the third factor, context, namely a Question level.

### 4.2.2 SUBJECTS

The same subjects that appeared in Experiment I were used in Experiment II. Previous random assignment within age groups to a given quantity was maintained.

#### 4.2.3 CONTEXT

The stimulus form Would you like to do A? and pairs of response paraphrases were administered under two contextual conditions, Request and Question. The predicted paraphrase for the Request condition was in the form of I want you to do A as contrasted with the non-predicted form Do you want to do A? Paraphrase predictions were reversed for the Question condition. Subjects within each of the three levels of QUANTITY received six variants of the discrimination task under the two levels of context for a total of 12 trials. Order of contextual condition and stimulus item variants with corresponding response alternatives was randomized across trials. The same order as illustrated in Table 2 for Experiment I was employed.

#### 4.2.4 QUANTITY

Three levels of quantity were again used, Full, NP, and Distorted, as in Experiment I.

#### 4.2.5 MATERIALS

The same physical setting and stimulus items from Experiment I were used (see 3.2.5 for a description) with a total of six items per contextual level using three indoor and three outdoor tape recorded variants. Six pairs of discrimination response items corresponding to the stimulus items variants were also employed for each contextual level. This time, however, paraphrase alternatives consisted of the

Request-Question contrast. Details are given below.

Appendix C gives a description of actual test items used.

#### 4.2.5.1 The Request Context

Contrast between the two contexts was marked by relative positioning of the S, H, and P. Presentation of the the Request condition occurred as outlined in Experiment I (3.2.5.2) and illustrated in Figure 3.

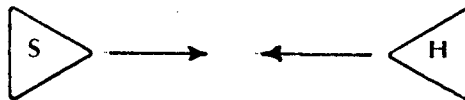
#### 4.2.5.2 The Question Context

Here, the teacher puppet joined a different child addressee at a distance of 10 - 12 cm from the plaything. S and H were looking at each other as shown in Figure 7. Equidistant positions for S and H from P were premarked to facilitate placement of the puppets by the subject. This was an attempt to convey first, the preparatory sincerity condition on a Question, (S cannot know whether or not H wants to do A) and, second, to provide grounds for S's rejection of a Request (I want you to to do A) interpretation, in that there should be no basis for inferring that S wants H to do A, itself a necessary condition for requesting. Understanding of the critical inferences regarding S's attitude toward H doing A were probed. Appropriate responses to the questions "What does the teacher want the child to do?" and "What does the child want to do?" would include "anything" or "I don't know" or suggestions of several alternative playthings.



Figure 7.

Constructed Context, QUESTION Condition



#### 4.2.5.3 Practice and Test Sessions

A minimum period of three weeks between the conclusion of Experiment I and the beginning of Experiment II was allowed to reduce the possibility of any serial effects. P1 and P2 (Experiment I) were omitted, as subjects were already familiar with the discrimination task. P3 remained and Practice Item 5 (P5) was substituted for P4. P5 introduced the Question context. Discrimination task trials followed the practice trials and were sometimes spaced over two sittings if a child became fatigued or lost interest. On most occasions however, testing was completed in one sitting. Each subject was presented with 12 stimulus sentences and their corresponding paraphrases.

#### 4.2.5.4 Analysis

Two analyses of variance were computed on the response scores for each age group under each quantity level and under each contextual condition. Mean scores for predicted and non-predicted responses in each contextual condition are summarized in Table 4. Elicited imitations and spontaneous responses were analyzed informally.

### 4.3 RESULTS

The 12 left-right responses per subject were converted into numerical scores out of six for each response alternative in each contextual condition. Mean scores for each age group

Table 4. Discrimination Task Means - Request/Question Contrast

| AGE | RESPONSE ALTERNATIVE | QUANTITY    | CONTEXT     |             |
|-----|----------------------|-------------|-------------|-------------|
|     |                      |             | Request     | Question    |
| 3   | I want you to do A   | Full        | <b>5.22</b> | 1.56        |
|     |                      | Noun Phrase | <b>4.56</b> | 1.67        |
|     |                      | Distorted   | <b>5.22</b> | 2.44        |
|     | Do you want to do A? | Full        | 0.78        | <b>4.44</b> |
|     |                      | Noun Phrase | 1.44        | <b>4.33</b> |
|     |                      | Distorted   | 0.78        | <b>3.56</b> |
| 4   | I want you to do A   | Full        | <b>4.67</b> | 3.22        |
|     |                      | Noun Phrase | <b>2.89</b> | 3.11        |
|     |                      | Distorted   | <b>3.33</b> | 2.67        |
|     | Do you want to do A? | Full        | 1.33        | <b>2.78</b> |
|     |                      | Noun Phrase | 3.11        | <b>2.89</b> |
|     |                      | Distorted   | 2.67        | <b>3.33</b> |

under each quantity level and under each contextual condition appear in Table 4. As in Experiment I, mean scores were submitted to two analyses of variance with repeated measures on the contextual factor.

Again, an analysis of variance of predicted and non-predicted discrimination task means (bold vs light) showed a highly significant main effect of predicted response in the predicted direction ( $F = 67.60$  (1, 48),  $p = .0000$ ). In the second analysis of variance, (summarized in Appendix D), comparing correct scores, we again discovered a main effect of age ( $F = 26.92$  (1, 48),  $p = .0000$ ), in the same direction favouring the performance of the three-year-olds. A main effect of context ( $F = 16.60$  (1, 48),  $p = .0002$ ) revealed that discrimination of Requests was generally better than of Questions. No main effect of the quantity variable was found.

However, as shown in Figure 8, quantity did interact with context, ( $F = 3.62$  (2, 48),  $p = .03$ ). Scheffé tests confirmed that all subjects discriminated Requests in the Full condition more effectively than they discriminated Questions in the NP condition ( $F = 18.41$  (5, 48),  $p < .01$ ) and the Distorted condition ( $F = 23.07$  (5, 48),  $p < .01$ ). As well, Full Requests were discriminated better than Requests in the NP condition ( $F = 15.26$  (5, 48),  $p < .05$ ). Furthermore, there was a significant difference between Requests and Questions in the Full conditions ( $F = 18.41$  (5, 48),  $p < .01$ ).

Figure 8  
Mean number of predicted Request and Question responses  
as a function of QUANTITY, Experiment II.

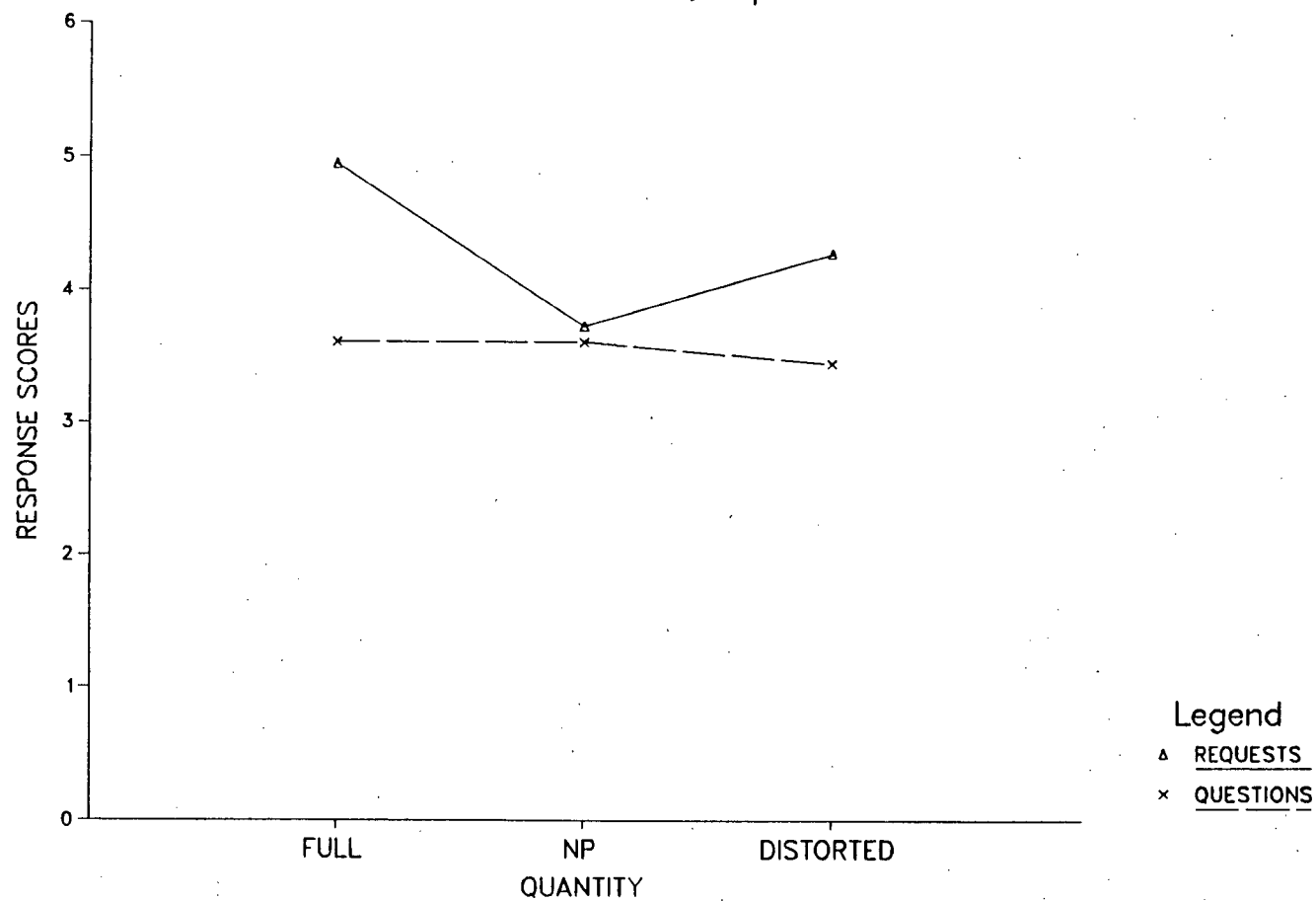
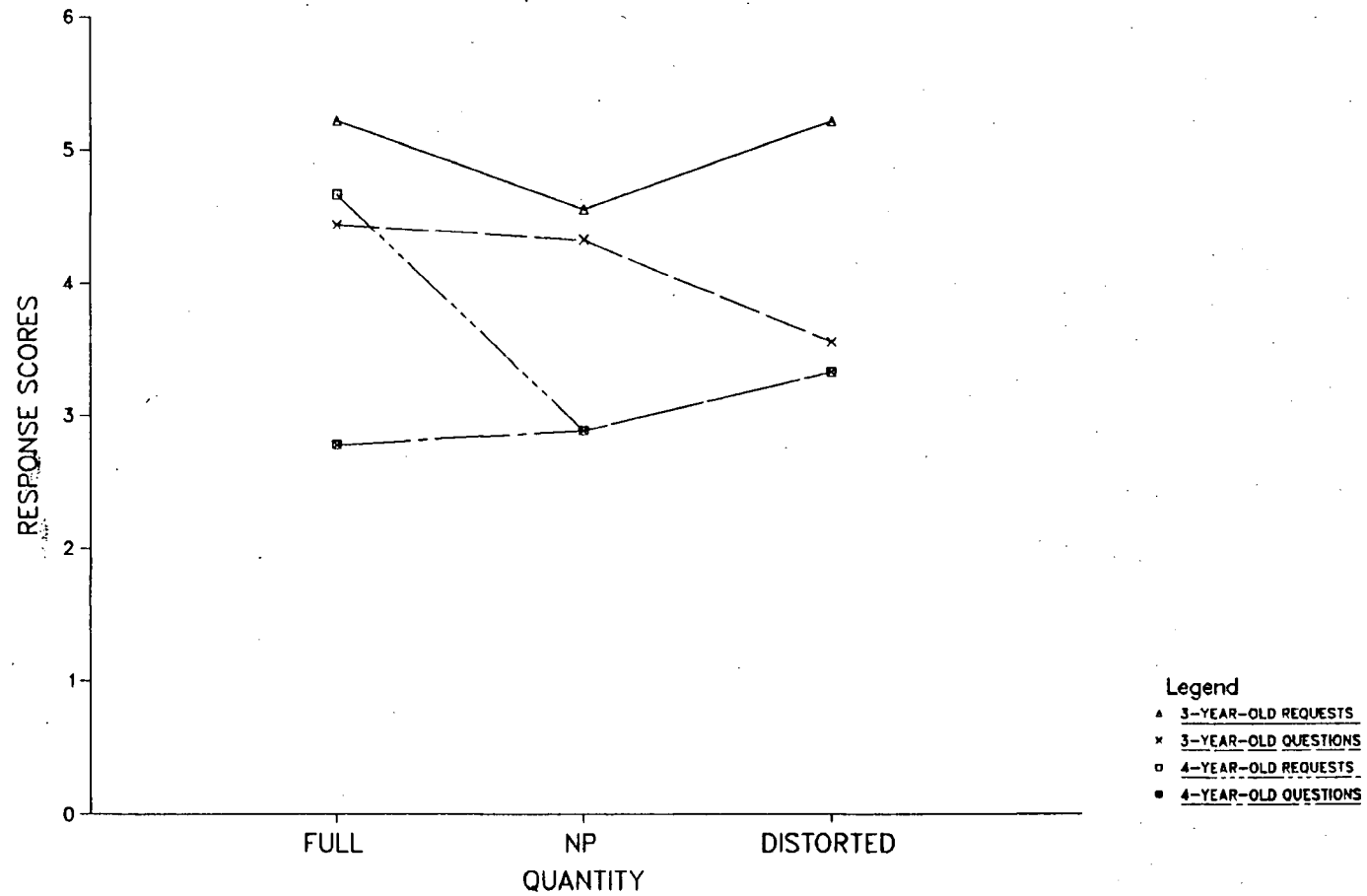


Figure 9.0  
Mean number of predicted Request and Question responses  
of 3 and 4-year-olds as a function of QUANTITY,  
Experiment II.



A three-way interaction, age x quantity x context was also discovered ( $F = 4.63$  (2, 48)  $p = .01$ ). Scheffé comparisons revealed that the source of the three-year-olds' advantage was their relatively better performance in the two reduced quantity levels ( $F = 32.46$  (11, 42)  $p = .01$ ). Their apparent superiority on the Question interpretation in the Full and NP conditions (see Figure 9.0), was not significant.

#### 4.4 DISCUSSION

The hypothesis that children would be able to differentiate between predicted and non-predicted responses for Requests and Questions was supported, indicating further that the experimental procedure used in Experiment I is sensitive enough to detect contextual differences. Also, the prediction that the younger subjects would outperform the four-year-olds was again supported ( $H_2'$ ).

An unexpected finding of a main effect of context in which children were better able to discriminate Requests than Questions warrants further discussion. It is suggested that a bias toward a 'non-literal' or 'indirect' speech act interpretation as defined by standard speech act theory, is in evidence. Some support for this interpretation is found in the literature. Shatz's (1974) findings of an early 'action response' bias in very young children is still evident at the third grade (Ackerman, 1978). In adults, Gibbs (1979, 1983) discovered a similar bias toward the

non-literal interpretation of an utterance. The results may also be attributed to an idiosyncratic aspect of the procedure in which one of the discrimination task alternatives "Do you want to do A?" is sometimes used to convey a request informally. Alternatively, the discrimination of the request condition may be facilitated because of the 'psychological directness' of "I want you to do A" (Ervin-Tripp & Gordon, in press). According to Ervin-Tripp (1984), inferring the speaker's intent is easier when it is explicitly stated (i.e., saying what's on your mind) than formulating what the hearer has to do. However, given the three-year-olds' relatively successful discrimination of Questions as compared to the four-year-olds, this explanation seems doubtful.

Although no main effect of quantity was found as predicted in H<sub>3</sub>', this does not necessarily imply that the reduced amount of propositional content did not affect discrimination. The effect of quantity is embedded within the interaction between context and quantity in which Questions are discriminated less reliably in the Full condition.

In considering our developmental hypothesis that three-year-olds would require less propositional content in the discrimination task, we need to examine in detail the interaction of quantity and context for each age group (Figures 9.0 - 9.2). The three-year-olds' overall advantage on the discrimination task appears to be the result of their



comparatively better performance in the two reduced quantity levels on Request interpretations (Figure 9.0).

Figure 9.1 shows only the three-year-olds' performance across quantity and contextual conditions. Although their discrimination of Requests in the NP and Distorted conditions was in the predicted direction, their discrimination of Questions at the Distorted level dropped unexpectedly. We consider this to result from a lack of good contextual information as much as from a lack of good linguistic information.<sup>2</sup> The constructed context for Questions was designed to be as neutral as possible in terms of non-propositional cues. It would seem that, in the absence of rich contextual cues, children have more difficulty in discriminating speaker intentions, and consequently, will be biased toward an action-based response.

The four-year-olds (Figure 9.2) performed not only relatively poorly in the reduced quantity levels across both contextual conditions as predicted, but also particularly poorly in the Full Question condition. The four-year-olds, in computing a literal interpretation for an indirect speech act, may experience more difficulty in assigning it because of their awareness of force-ambiguity. For the older children, the task is much more complex because of their increasing reliance upon linguistic information in determining illocutionary force, whereas the younger

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<sup>2</sup> I would like to thank Rita Watson for her insightful comments in helping formulate this explanation.

Figure 9.1  
Mean number of predicted Request and Question responses  
of 3-year-olds as a function of QUANTITY,  
Experiment II.

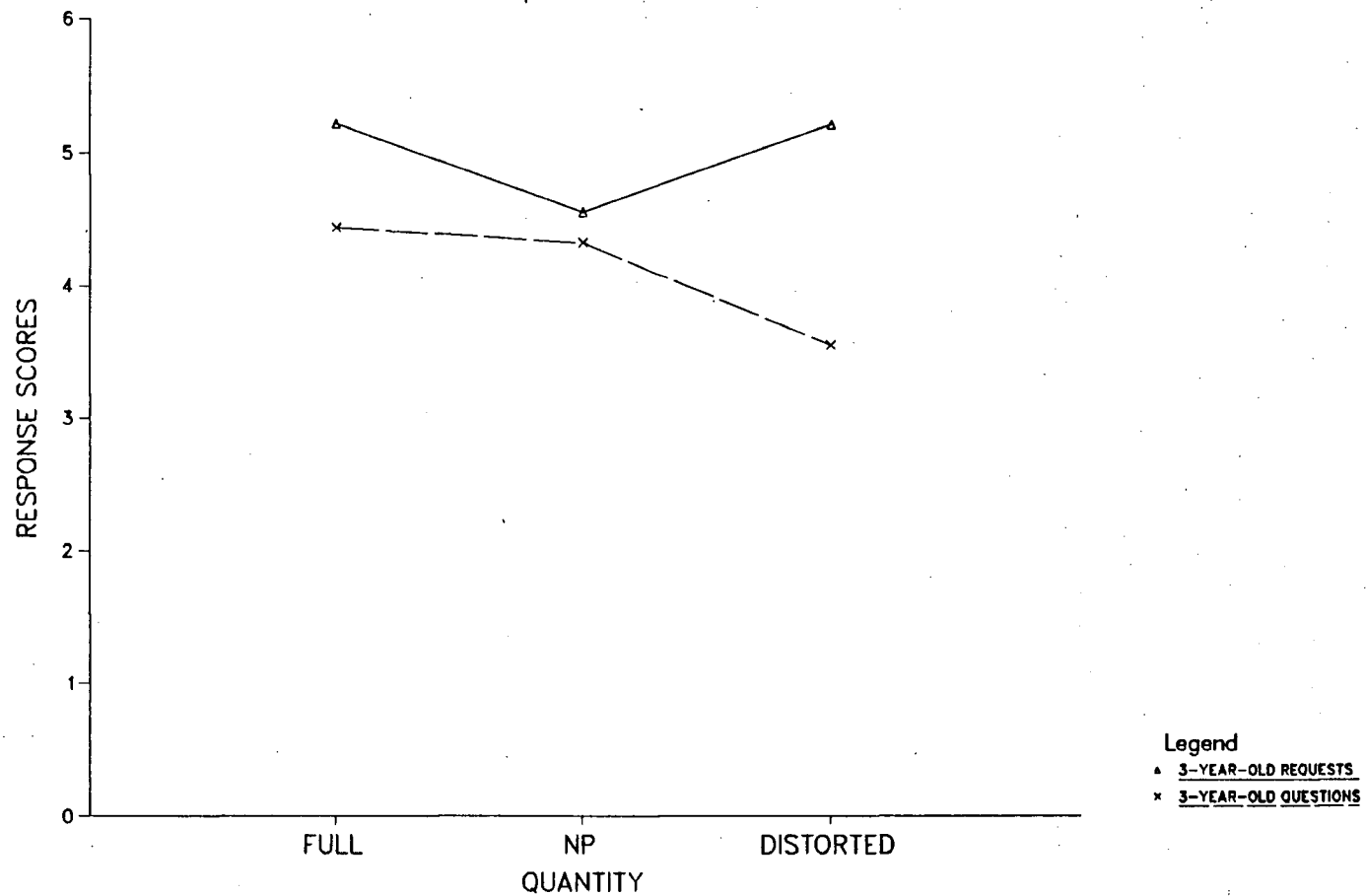
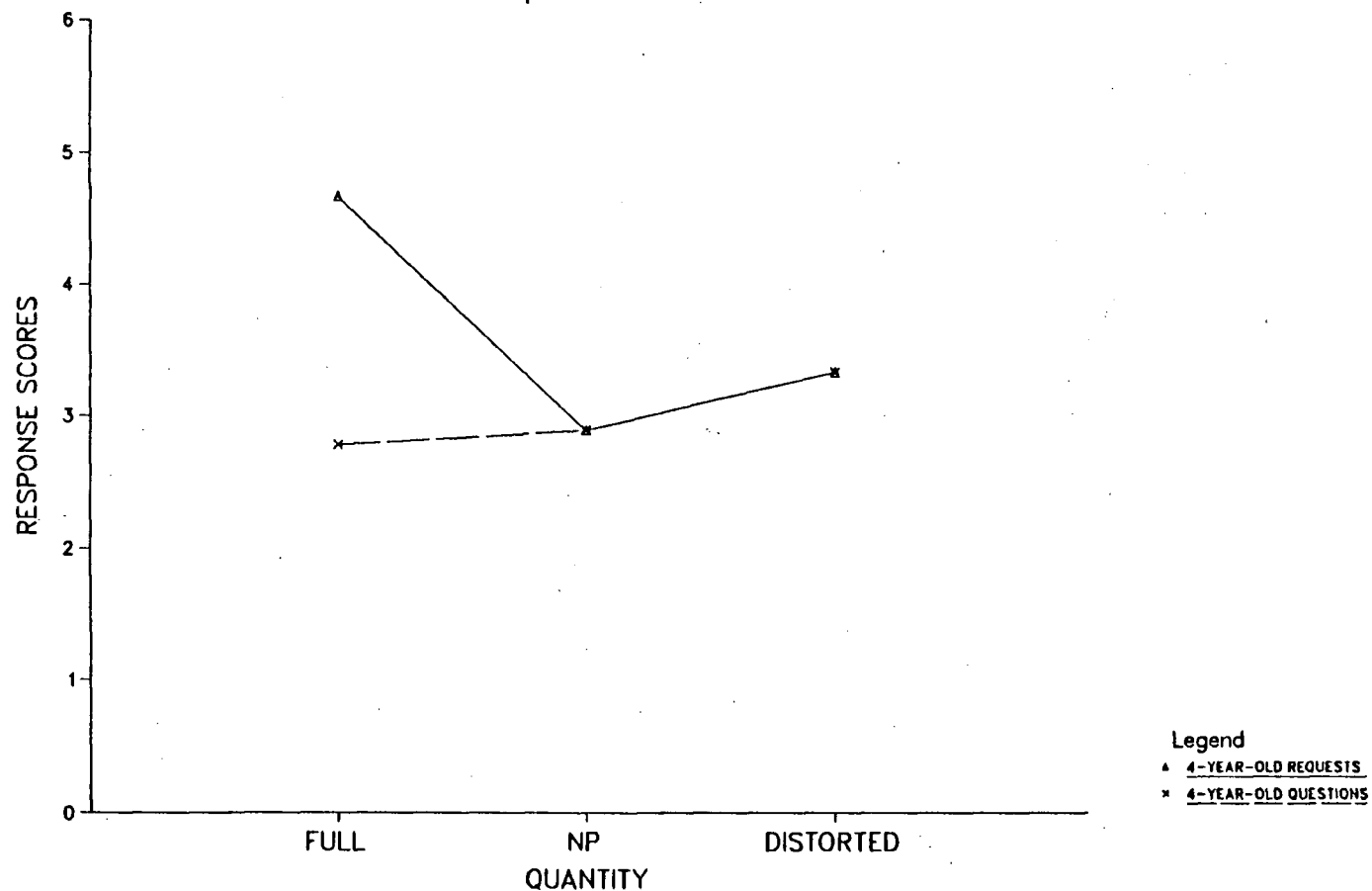


Figure 9.2  
Mean number of predicted Request and Question responses  
of 4-year-olds as a function of QUANTITY,  
Experiment II.



children are more heavily dependent upon contextual cues.

Elicited Imitation Task. Again, as in Experiment I, the four-year-olds' verbatim responses (47 of a total of 54) were considerably more frequent than the three-year-olds' (14 out of 54). The younger children tended to reduce their responses to a verb or object nounphrase (23/54) whereas this occurred only once for the older children. In addition, the three-year-olds tended to accompany their responses with actions (i.e., placing the puppets on the various playthings). These informal results provide corroboration of our previous findings regarding the attention to function rather than form by the younger children. Conversely, the older children's increasing awareness of linguistic detail is evidenced in the number of accurate imitations.

## CHAPTER FIVE

### THE ROLE OF LANGUAGE IN SPEECH ACT COMPREHENSION

#### 5.1 GENERAL DISCUSSION

The findings on the effects of context on children's performance on the discrimination task replicate those reported by Reeder (1980, 1981) offering further support to the conclusion that young children can discriminate between speech acts using contextual cues. The results of the two experiments discussed individually above can now both be considered in the context of the major research question investigated here: the extent to which children depend upon linguistic-propositional content in determining illocutionary force.

##### 5.1.1 AGE X QUANTITY

Shatz (1978, 1983) maintains that at the earliest stages children do not focus upon linguistic information in their understanding of indirect speech acts but rely upon a primitive pragmatic strategy using an action-based response. Gradually they learn to use more linguistic and contextual cues in responding appropriately to illocutionary ambiguity. The focus of this study, therefore, was to examine whether children were able to determine illocutionary force with reduced linguistic-propositional information and to see whether this ability interacted with a developmental variable of age.

The results of this study indicate that reliance upon linguistic information in determining illocutionary force increases with age. Younger children could competently discriminate between Requests and Offers, and Requests and Questions regardless of the amount of propositional content available to them. The tendency of these children is to attend to contextually-based rather than linguistic information. Older children, on the other hand, when given reduced linguistic information, were less able to discriminate between speech acts. Attention to propositional content, therefore, appears to function differently for three and four-year-olds. These findings offer further support for postulating a developmental shift in children's speech act processing from directly inferring intent from contextual cues to a more linear approach which relies more heavily upon propositional information.

#### 5.1.2 AGE X CONTEXT

Searle (1979) and Clark (1979) among others claim that comprehension of indirect speech acts (utterances with multiple possible pragmatic interpretations) requires processing of the literal interpretation of an utterance in addition to its conversationally conveyed meaning. Gibbs challenged this claim suggesting that the conveyed meaning can be directly inferred on the basis of its conventionality and context. The current study investigated as a subsidiary question, developmental differences in assigning a literal

interpretation to indirect speech acts by examining the interaction between age and context. The overall findings cast considerable doubt on the psychological validity of the linear model's claim of the necessity of determining the literal meaning of indirect speech acts. This was demonstrated by the effects of context on children's performance on the discrimination task in Experiment II. If children were computing the literal force in each speech act interpretation, their performance in the Question condition should have been at least as reliable as in the Request condition. Instead, requests were discriminated more reliably than Questions, indicating that children were considering the non-literal interpretation directly. This was in spite of the fact the Question paraphrase more closely resembled the stimulus utterances in syntactic and semantic form.

## 5.2 SUMMARY OF EXPERIMENTAL FINDINGS

This study examined the effects of varying the amount of propositional content available in a speech act on three and four-year-old children's comprehension of requests, offers, and questions. A subsidiary issue raised was the extent to which the literal meaning of a speech act is considered in addition to its intended non-literal or indirect meaning. Two factorial experiments were conducted which contrasted a pair of speech acts. Results indicated that younger subjects were generally unaffected by reduced amounts of

linguistic information, relying more heavily on non-linguistic contextual information as a basis of discrimination between speech acts. The older subjects were generally adversely affected by reduced quantity, requiring more linguistic information in order to make illocutionary paraphrase judgments. Evidence from the elicited imitation task corroborated these results. These findings are consistent with the claim that younger children use a speech act comprehension strategy which is relatively more context-dependent, whereas older children are more text-dependent. It is suggested this reflects the role of developing linguistic awareness as a factor underlying these changing strategies. Younger children appear to be processing illocutionary force in a direct manner, while older children are taking into account a broader range of linguistically possible interpretations perhaps including literal meaning.

### 5.3 CONCLUSIONS AND IMPLICATIONS

The overall findings of the present study indicate that although subjects are able to discriminate between contexts using contextual cues, the absence of good linguistic information is more likely to affect the older children. Furthermore, even when full propositional content was available, the four-year-olds still had difficulty in interpreting Offers and Questions whereas the three-year-olds experienced relative difficulty only with



distorted Questions. Several conclusions can be drawn from these results.

As indicated in the developmental literature cited above (2.3), young children's pragmatic competence is well established by around three years at least in terms of inferring illocutionary intent. This competence is acquired in normal communicative interaction where readily available contextual support often makes additional linguistic information redundant. Although it is not beyond the preschool child's ability to take linguistic information into account, it is less important to the child at this stage. Because the linguistic meaning of an utterance is embedded in context, the contextual factors are more salient in signalling pragmatic intent. In the absence of rich contextual information, children have more difficulty interpreting illocutionary force (as illustrated by their difficulty with the Question context of Experiment II). Younger children, in particular, seem to revert to an earlier action-based response strategy as was discovered by Shatz (1978b).

Other maturational differences in speech act processing strategies appear to occur. Older children are able to consider a range of possible linguistic interpretations based on their knowledge of language conventions while younger children base their strategies on their knowledge of the world ( cf. Hildyard & Olson, 1982). Younger subjects appear to be direct processors of speech act

meaning using their world-based knowledge whereas the older children are more linear in their approach as a consequence of their attending to conventionality and form. This conclusion complements Gibbs' findings in adult research (1979).

It appears that the older subjects in our study are at the early stages of differentiating form and function and consequently are experiencing some difficulty in using their developing linguistic awareness in the most efficient manner. An extension of upper developmental bound to include five and possibly six-year-olds would allow us to investigate the possibility of a U-shaped curve in the ability to coordinate linguistic and contextual information.

In addition, the results of this study need further investigation with respect to the necessity of aspects other than quantity of propositional content in comprehending speech acts. It would also be of interest to know if different speech acts could be expected to perform similarly across the same age and quantity levels. Replication of this study to include Assertions, for example, would contribute to our knowledge about another one of the predominant speech acts used in classroom discourse.

Given this information, a more systematic account of how children develop in their ability to infer intentions from what was said would be possible and consequently could be reflected in teaching practices which were sensitive to these differential strategies.

An investigation of the role of experience in addition to chronological age, in the shift of these speech act processing strategies might reveal some interesting differences. Children whose preschool experiences have provided them with many opportunities to use language in similiar ways to those relied upon in school (i.e., using language as a separate entity) may be at an advantage (Olson, 1984). Do children who have been exposed to these kinds of experiences behave similarly to our older subjects when discriminating speech acts?

Some children may need help in understanding the role of linguistic information in understanding communicative intent. Their experiences or maturational level may be such that they have difficulty in 'bootstrapping' their linguistic knowledge onto their real world knowledge. Much of school learning requires that children suspend their ability to use language in conversational contexts, extracting it from its communicative function in order to 're-embed' it as an abstract object in various tasks. For those children having difficulty coordinating linguistic and pragmatic rules, explicit teaching strategies to develop their linguistic awareness may help extend their overall communicative competence.

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## APPENDICES

## APPENDIX A

### EXPERIMENT I: Discrimination Task Battery, Full and Distorted Conditions

#### A. REQUEST Condition, 6 items

| Stimulus Items                              | Response Alternatives                |                                     |
|---|--------------------------------------|-------------------------------------|
| 1. Would you like to play on the train?     | I want you to play on the train.     | I'll let you play on the train.     |
| 2. Would you like to play on the slide?     | I want you to play on the slide.     | I'll let you play on the slide.     |
| 3. Would you like to play on the horse?     | I want you to play on the horse.     | I'll let you play on the horse.     |
| 4. Would you like to play with the blocks?  | I want you to play with the blocks.  | I'll let you play with the blocks.  |
| 5. Would you like to play at the sandtable? | I want you to play at the sandtable. | I'll let you play at the sandtable. |
| 6. Would you like to look at the books?     | I want you to look at the books.     | I'll let you look at the books.     |

#### B. OFFER Condition, 6 items

Stimulus and response items are identical to those presented in in A above.

#### C. Practice Items

| Practice Items                          | Response Alternatives           |                                |
|---|---------------------------------|--------------------------------|
| P1. the bike                            | the bike                        | the slide                      |
| P2. the picture                         | the books                       | the picture                    |
| P3. Would you like to play on the bike? | I want you to play on the bike. | I'll let you play on the bike. |
| P4. Would you like to make a picture?   | I want you to make a picture.   | I'll let you make a picture.   |

## APPENDIX A (cont.)

### EXPERIMENT I: Discrimination Task Battery, Object Noun Phrase (NP) Condition

#### A. REQUEST Condition, 6 items

| Stimulus Items    | Response Alternatives                |                                     |
|-------------------|--------------------------------------|-------------------------------------|
| 1. the train?     | I want you to play on the train.     | I'll let you play on the train.     |
| 2. the slide?     | I want you to play on the slide.     | I'll let you play on the slide.     |
| 3. the horse?     | I want you to play on the horse.     | I'll let you play on the horse.     |
| 4. the blocks?    | I want you to play with the blocks.  | I'll let you play with the blocks.  |
| 5. the sandtable? | I want you to play at the sandtable. | I'll let you play at the sandtable. |
| 6. the books?     | I want you to look at the books.     | I'll let you look at the books.     |

#### B. OFFER Condition, 6 items

Stimulus and response items are identical to those presented in in A above.

#### C. Practice Items

|                 | Response Alternatives           |                                |
|-----------------|---------------------------------|--------------------------------|
| P1. the bike    | the bike                        | the slide                      |
| P2. the picture | the books                       | the picture                    |
| P3. the bike?   | I want you to play on the bike. | I'll let you play on the bike. |
| P4. a picture?  | I want you to make a picture.   | I'll let you make a picture.   |

## APPENDIX B

## Summary of Analysis of Variance for Predicted Means, EXPERIMENT I

| Source           | SS      | df | MS      | F      | p    |
|------------------|---------|----|---------|--------|------|
| Between-Subjects |         |    |         |        |      |
| AGE              | 19.59   | 1  | 19.59   | 11.82  | .001 |
| QUANTITY         | 16.67   | 2  | 8.33    | 5.03   | .01  |
| A X Q            | 9.85    | 2  | 4.93    | 2.97   | .06  |
| ERROR            | 79.56   | 48 | 1.66    |        |      |
| Within-Subjects  |         |    |         |        |      |
| CONTEXT          | 0.33    | 1  | 0.33    | 0.25   | .62  |
| A X C            | 6.26    | 1  | 6.26    | 4.78   | .03  |
| Q X C            | 2.00    | 2  | 1.00    | 0.76   | .47  |
| A X Q X C        | 0.52    | 2  | 0.26    | 0.20   | .82  |
| ERROR            | 62.89   | 48 | 1.32    |        |      |
| Total            | 1408.33 | 1  | 1408.33 | 849.72 |      |

## APPENDIX C

### EXPERIMENT II: Discrimination Task Battery, Full and Distorted Conditions

#### A. REQUEST Condition, 6 items

| Stimulus Items                              | Response Alternatives                |                                       |
|---|--------------------------------------|---------------------------------------|
| 1. Would you like to play on the train?     | I want you to play on the train.     | Do you want to play on the train?     |
| 2. Would you like to play on the slide?     | I want you to play on the slide.     | Do you want to play on the slide?     |
| 3. Would you like to play on the horse?     | I want you to play on the horse.     | Do you want to play on the horse?     |
| 4. Would you like to play with the blocks?  | I want you to play with the blocks.  | Do you want to play with the blocks?  |
| 5. Would you like to play at the sandtable? | I want you to play at the sandtable. | Do you want to play at the sandtable? |
| 6. Would you like to look at the books?     | I want you to look at the books.     | Do you want to look at the books?     |

#### B. QUESTION Condition, 6 items

Stimulus and response items are identical to those presented in A above.

#### C.

| Practice Items                          | Response Alternatives           |                                  |
|---|---------------------------------|----------------------------------|
| P3. Would you like to play on the bike? | I want you to play on the bike. | Do you want to play on the bike? |
| P5. Would you like to make a picture?   | I want you to make a picture.   | Do you want to make a picture?   |

## APPENDIX C (cont.)

### EXPERIMENT II: Discrimination Task Battery, Object Noun Phrase (NP) Condition

#### A. REQUEST Condition, 6 items

| Stimulus Items    | Response Alternatives                |                                       |
|-------------------|--------------------------------------|---------------------------------------|
| 1. the train?     | I want you to play on the train.     | Do you want to play on the train?     |
| 2. the slide?     | I want you to play on the slide.     | Do you want to play on the slide?     |
| 3. the horse?     | I want you to play on the horse.     | Do you want to play on the horse?     |
| 4. the blocks?    | I want you to play with the blocks.  | Do you want to play with the blocks?  |
| 5. the sandtable? | I want you to play at the sandtable. | Do you want to play at the sandtable? |
| 6. the books?     | I want you to look at the books.     | Do you want to look at the books?     |

#### B. QUESTION Condition, 6 items

Stimulus and response items are identical to those presented in A above.

#### C.

| Practice Items | Response Alternatives           |                                  |
|----------------|---------------------------------|----------------------------------|
| P3. the bike?  | I want you to play on the bike. | Do you want to play on the bike? |
| P5. a picture? | I want you to make a picture.   | Do you want to make a picture?   |

## APPENDIX D

## Summary of Analysis of Variance for Predicted Means, EXPERIMENT II

| Source            | SS      | df | MS      | F       | p     |
|-------------------|---------|----|---------|---------|-------|
| Between- Subjects |         |    |         |         |       |
| AGE               | 41.56   | 1  | 41.56   | 26.92   | .0000 |
| QUANTITY          | 7.02    | 2  | 3.51    | 2.27    | .11   |
| A X Q             | 1.35    | 2  | 0.68    | 0.44    | .65   |
| ERROR             | 74.11   | 48 | 1.54    |         |       |
| Within- Subjects  |         |    |         |         |       |
| CONTEXT           | 15.56   | 1  | 15.56   | 16.60   | .0002 |
| A X C             | 0.45    | 1  | 0.45    | 0.48    | .49   |
| Q X C             | 6.80    | 2  | 3.40    | 3.62    | .03   |
| A X Q X C         | 8.69    | 2  | 4.34    | 4.63    | .01   |
| ERROR             | 45.00   | 48 | 0.94    |         |       |
| Total             | 1672.45 | 1  | 1672.45 | 1083.21 |       |