

## INFORMATION TO USERS

This reproduction was made from a copy of a document sent to us for microfilming. While the most advanced technology has been used to photograph and reproduce this document, the quality of the reproduction is heavily dependent upon the quality of the material submitted.

The following explanation of techniques is provided to help clarify markings or notations which may appear on this reproduction.

1. The sign or "target" for pages apparently lacking from the document photographed is "Missing Page(s)". If it was possible to obtain the missing page(s) or section, they are spliced into the film along with adjacent pages. This may have necessitated cutting through an image and duplicating adjacent pages to assure complete continuity.
2. When an image on the film is obliterated with a round black mark, it is an indication of either blurred copy because of movement during exposure, duplicate copy, or copyrighted materials that should not have been filmed. For blurred pages, a good image of the page can be found in the adjacent frame. If copyrighted materials were deleted, a target note will appear listing the pages in the adjacent frame.
3. When a map, drawing or chart, etc., is part of the material being photographed, a definite method of "sectioning" the material has been followed. It is customary to begin filming at the upper left hand corner of a large sheet and to continue from left to right in equal sections with small overlaps. If necessary, sectioning is continued again—beginning below the first row and continuing on until complete.
4. For illustrations that cannot be satisfactorily reproduced by xerographic means, photographic prints can be purchased at additional cost and inserted into your xerographic copy. These prints are available upon request from the Dissertations Customer Services Department.
5. Some pages in any document may have indistinct print. In all cases the best available copy has been filmed.

**University  
Microfilms  
International**

300 N. Zeeb Road  
Ann Arbor, MI 48106

8508707

**Johnson, Bonnie D.**

**ADULT LINGUISTIC INTERACTION WITH SPECIFIC LANGUAGE  
DISORDERED AND NORMALLY DEVELOPING CHILDREN**

*City University of New York*

PH.D. 1985

**University  
Microfilms  
International** 300 N. Zeeb Road, Ann Arbor, MI 48106

**Copyright 1985**

**by**

**Johnson, Bonnie D.**

**All Rights Reserved**

PLEASE NOTE:

In all cases this material has been filmed in the best possible way from the available copy.  
Problems encountered with this document have been identified here with a check mark ✓.

1. Glossy photographs or pages \_\_\_\_\_
2. Colored illustrations, paper or print \_\_\_\_\_
3. Photographs with dark background \_\_\_\_\_
4. Illustrations are poor copy \_\_\_\_\_
5. Pages with black marks, not original copy \_\_\_\_\_
6. Print shows through as there is text on both sides of page \_\_\_\_\_
7. Indistinct, broken or small print on several pages ✓
8. Print exceeds margin requirements \_\_\_\_\_
9. Tightly bound copy with print lost in spine \_\_\_\_\_
10. Computer printout pages with indistinct print \_\_\_\_\_
11. Page(s) \_\_\_\_\_ lacking when material received, and not available from school or author.
12. Page(s) \_\_\_\_\_ seem to be missing in numbering only as text follows.
13. Two pages numbered \_\_\_\_\_. Text follows.
14. Curling and wrinkled pages \_\_\_\_\_
15. Other \_\_\_\_\_

University  
Microfilms  
International

**ADULT LINGUISTIC INTERACTION WITH SPECIFIC  
LANGUAGE DISORDERED AND NORMALLY DEVELOPING CHILDREN**

by

**BONNIE D. JOHNSON**

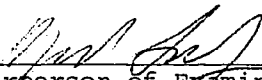
**A dissertation submitted to the  
Graduate Faculty in Speech and Hearing  
Sciences in partial fulfillment of  
the requirements for the degree of  
Doctor of Philosophy,  
The City University of New York.**

**1985**

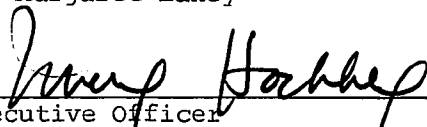
© COPYRIGHT BY  
BONNIE D. JOHNSON  
1985

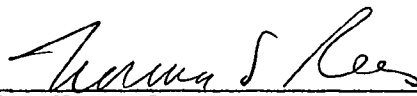
This manuscript has been read and accepted for the Graduate Faculty in Speech and Hearing Sciences in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

2/20/85  
date

  
Chairperson of Examining Committee  
Dr. Margaret Lahey

\_\_\_\_\_  
date

  
Executive Officer  
Dr. Irving Hochberg

  
Dr. Norma Rees

  
Dr. Lou Gerstman

\_\_\_\_\_  
Supervisory Committee

## ACKNOWLEDGEMENTS

I want to thank those colleagues, advisors, and friends whose encouragement and guidance helped me in this effort. Dr. Peg Lahey, my major advisor, directed this research and provided guidance and suggestions throughout the study. Dr. Lou Gerstman generously provided his expertise in the statistical analysis of my data. Dr. Norma Rees contributed thoughtful questions and comments to improve the research and interpretation of the findings.

I particularly wish to thank all of the children, parents and other adult friends who so willingly played together to provide me with the data for this study.

My greatest thanks go to my family. My late father, Herman Diedrich, and mother, Jan Diedrich, offered encouragement throughout my doctoral career. Tim, my husband, I especially thank for his continual support and personal sacrifices. And my special little daughter, Whitney, who arrived one year ago, I thank for the perpetual smiles and joy she provided me during the writing of this manuscript.

## TABLE OF CONTENTS

I. CHAPTER ONE - INTRODUCTION AND BACKGROUND . . . . .	1
Introduction . . . . .	1
Review of Related Literature . . . . .	5
Nature of Adult Speech to Children . . . . .	6
Factors Influencing Modifications in Adult-Child Language . . . . .	11
Linguistic Development . . . . .	11
Cognitive Development . . . . .	22
Adult Interaction Strategy . . . . .	28
Speech to Children and Language Acquisition . . . . .	32
Maternal Response Style . . . . .	34
Functions of Maternal Language . . . . .	41
Need for the Study . . . . .	43
Research . . . . .	48
II. CHAPTER TWO - METHODS . . . . .	50
Subject Selection and Description . . . . .	50
Children with Specific Language Disorder. . . . .	51
Normally Developing Children . . . . .	52
Adult Strangers . . . . .	55
Screening Procedures . . . . .	56
Data Collection Procedures . . . . .	57
Reliability Measures . . . . .	58
Analysis of the Data . . . . .	59
Categories . . . . .	61
III. CHAPTER THREE - RESULTS . . . . .	67
Major Findings . . . . .	68

## TABLE OF CONTENTS (continued)

Data Related to Maternal Linguistic Interaction . . .	70
Maternal Responses . . . . .	70
SLD and LM mothers . . . . .	71
SLD and AM mothers . . . . .	73
LM and AM mothers . . . . .	73
All mothers . . . . .	74
Functions of Maternal Speech . . . . .	75
SLD and LM mothers . . . . .	77
SLD and AM mothers. . . . .	78
LM and AM mothers . . . . .	78
Other Conversational Features . . . . .	79
Maternal MLU. . . . .	82
Data Related to Adult Stranger Linguistic Interaction . . . . .	82
Adult Stranger Responses . . . . .	84
SLD and LM groups . . . . .	84
SLD and AM groups . . . . .	86
LM and AM groups . . . . .	87
Functions of Adult Stranger Speech . . . . .	87
SLD and LM groups . . . . .	89
SLD and AM groups . . . . .	89
LM and AM groups . . . . .	90
Adult Strangers' Use of Other Conversational Features . . . . .	90
Strangers' MLU . . . . .	92
Data Comparing Maternal and Adult Linguistic Interaction with SLD Children . . . . .	93

TABLE OF CONTENTS (continued)

IV. CHAPTER FOUR - SUMMARY AND DISCUSSION . . . . .	99
Response vs. Strategy; The Influence of the Child's Language. . . . .	101
Implications for Language Learning . . . . .	103
Semantic Relatedness . . . . .	105
New Topic Responses . . . . .	107
Adult Controlled Utterances . . . . .	107
Ready Made Responses . . . . .	109
Self Repetitions . . . . .	110
Directives and Assertives . . . . .	111
Continuing Utterances . . . . .	113
The SLD Child's Linguistic Environment . . . . .	115
Semantic Relatedness and the SLD Child's Linguistic Environment . . . . .	116
Nonresponse and the SLD Child . . . . .	121
Limitations of the Study . . . . .	123
Suggestions for Further Research . . . . .	124
Conclusions . . . . .	125
APPENDIX A . . . . .	128
APPENDIX B . . . . .	129
APPENDIX C . . . . .	130
BIBLIOGRAPHY . . . . .	133

## LIST OF TABLES

Table	Page
1 Identifying data for children with specific language disorder (SLD) and their mothers (M)	53
2 Identifying data for LM children and their mothers (M)	54
3 Identifying data for age-matched (AM) children and mothers (M)	55
4 Identifying data for adult strangers	56
5 Number of utterances (out of 200) in each of the response type categories in the speech of individual mothers (M) and strangers (S) for each group of children - specific language disordered (SLD), language-matched (LM), and age-matched (AM)	130
6 Number of utterances (out of 200) in each of the function categories in the speech of individual mothers (M) and strangers (S) with children in each of the three groups - specific language disordered (SLD), language-matched (LM), and age-matched (AM)	131
7 Number of occurrences of each of the 'other conversational categories' in the speech of individual mothers (M) and strangers (S) with each child in the three groups - specific language disordered (SLD), language-matched (LM), and age-matched (AM)	132
8 Individual and mean MLU for mothers in each of the three groups of children	82
9 The number of child utterances in the specific language disordered (SLD), language-matched (LM) and age-matched (AM) groups to mothers (M) and strangers (S) occurring with the 200 consecutive adult utterances analyzed	84
10 The child MLU to mothers (M) and strangers (S)	84
11 Individual and mean MLU for strangers in each of the three groups of children	92
12 Standard and F test sample variance for SLD and normally developing groups on the conversational features 'utterances not related to the child's focus' and 'nonresponse' in mothers' talk	98

## LIST OF FIGURES

Figure	Page
1 Average frequency of utterances (out of 200) in each response type category used by mothers with specific language disordered (SLD), language-matched (LM), and age-matched (AM) children	71
2 Average frequency of utterances (out of 200) in each functional category used by mothers with specific language disordered (SLD), language-matched (LM), and age-matched (AM) children	76
3 Average frequency of occurrences (out of 200 utterances) of 'other conversational categories' used by mothers with specific language disordered (SLD), language-matched (LM), and age-matched (AM) children	80
4 Average frequency of utterances (out of 200) in each response type category used by strangers with specific language disordered (SLD), language-matched (LM), and age-matched (AM) children	85
5 Average frequency of utterances (out of 200) in each functional category used by strangers with specific language disordered (SLD), language-matched (LM), and age-matched (AM) children	88
6 Average frequency of occurrences (out of 200 utterances) of 'other conversational categories' used by strangers with specific language disordered (SLD), language-matched (LM), and age-matched (AM) children	91
7 Individual and group frequency of response types in the speech of mothers (M) and strangers (S) with specific language disordered (SLD) children	95
8 Individual and group frequency of functions in the speech of mothers (M) and strangers (S) with specific language disordered (SLD) children	96
9 Individual and group frequency of 'other conversational categories' in the speech of mothers (M) and strangers (S) with specific language disordered (SLD) children	97

CHAPTER ONE

INTRODUCTION AND BACKGROUND

The linguistic environment is acknowledged as the source from which the child learns language. However, its importance in the language acquisition process has only recently been emphasized. This is reflected in numerous studies over the past decade which have revealed that, unlike speech among adults, language addressed to children is semantically and syntactically simple, fluent, repetitive and related to shared environmental and verbal context (Snow, 1972, Broen, 1972, Cross, 1977, Remick, 1973, Garnica, 1977, Nelson, 1973, Levinson, 1979, Phillips, 1973, Vorster, 1975). Thus, it appears to be an adequate model from which the child could learn language.

Further studies have considered what factors influence the modifications adults make in their child-addressed language, and the effect of these modifications on the child's language learning. Those factors cited as influencing the speaker's linguistic adjustments when talking to children include child variables such as age, cognitive maturity and linguistic competence (Cross, 1977, 1978, Newport, Gleitman, and Gleitman, 1977, Shatz and Gelman, 1973, 1977, Bellinger, 1980). Other influencing variables include the adult's perceptions of the child's needs (Gleason and Weintraub, 1978), as well as their

interactional intent when talking to the child (McDonald and Pien, 1981, Olsen-Fulero, 1982).

How these modifications influence the child's language acquisition has been a matter of much interest. Certain features of the linguistic environment of normally developing children have been found to be highly correlated with the child's rate of language learning. In particular, it appears to be the adult's willingness and capacity to take verbal turns with the child, together with the content and function of these turns that may be important for the child's language development (Cross, 1978, Nelson, 1973, Snow, 1978, Wells, 1980a).

These issues have led to an interest in speech directed to language disordered children. Because of their language deficits, these children can help to substantiate what is known about speech directed to normally developing children, particularly in regard to the relationship of the child's language level to linguistic interaction from adults. Perhaps more important, interest in this population stems from professionals concerned with the quality of the linguistic environment of a child with a language disorder, and the resulting implications for clinical intervention. Certainly, it is the aim of the professional to ensure that parents of the language disordered child provide an optimal language learning environment for their child. However, it is first necessary to examine whether the parents of these children differ in their linguistic interaction when

compared with parents of normally developing children, and, if different then to discover the factors that influence this interaction. This knowledge will aid in determining whether effecting changes in the parents interaction is desirable, and if so, will help in designing appropriate intervention approaches.

Early studies of linguistic input to disordered children focussed primarily on the language addressed to select populations such as the mentally retarded and psychotic who have deficits in cognitive and emotional areas in addition to a language disorder (Siegel, 1963a, 1963b, Buium, Rynders, and Turnure, 1974, Goldfarb, Goldfarb, and Scholl, 1966, Frank, Allen, Stein, and Meyers, 1976). The linguistic environment of the child with a specific language disorder has received less attention. These children are defined as those who have significant difficulties learning language despite what appears to be normal nonlinguistic cognitive abilities, normal hearing, and no evidence of neurological or emotional disturbance. Language spoken to these children has been found to be different in certain respects from that of normally developing children. However, it is not known what factors may have produced these differences. Since the literature on normally developing children suggests that both linguistic level and cognitive maturity play a role in guiding the adult's language, it is necessary to compare the environment of the child with a specific language disorder to younger children

(with apparently similar level of language development) and age-peer children (with apparently similar cognitive abilities). No study of children with specific language disorder has considered the influence of both of these aspects of the child's development on the adult's child-directed language.

It is also unclear whether parents' speech to language disordered children is simply responsive to the child's varying abilities or if it is a result of maternal interaction strategy. It has been suggested that the parent's confusion concerning the child's development, difficulties with interaction in the past, or knowledge that the child has a disorder may contribute to the interaction and may result in a less than optimal language learning environment (Wulbert, Inglis, Kriegsmann, and Mills, 1975, Newhoff, Silverman, and Millet, 1980, Petersen and Sherrod, 1982). It also has been noted that characteristics of the child's behavior or linguistic style may stimulate the parent to adjust her language accordingly (Conti-Ramsden and Friel-Patti, 1984, Jones, 1977, Cunningham, Reuler, Blackwell, and Deck, 1981). Comparing the parent's language to that of another adult interacting with the language disordered child will help to clarify whether the parent's speech is responsive to the child and perhaps necessary for maintaining the interaction.

In addition, a number of studies of input to children with a specific language disorder have dealt largely with

formal aspects of these children's linguistic environment. However, formal properties of input have not been found to play an important role in the child's language learning; rather, it is the content and function of the adult's child-directed discourse that has been most closely associated with the child's rate of language learning.

This study examined primarily discourse and functional aspects of mother's speech to children. Mothers of children with specific language disorder were compared to two groups of mothers of normally developing children, one whose children were matched for language abilities (thus younger in age), and one whose children had similar nonlinguistic cognitive abilities (age peers). By using the two types of normally developing children, it was hoped to infer the effect of the child's language and cognitive level on the mother's language. The speech of each of the mothers was also compared to an adult stranger's speech to their child. This was designed to discover aspects of the interaction which may be responsive to the child.

#### Review of Related Literature

Linguistic theories have placed differing importance on the roles of innate capacity and environment in accounting for the acquisition of language. Researchers such as Chomsky (1965), Fodor (1966), and McNeill (1966) proposed only a minimal role for the environment. They postulated that the rule structures of language are innate and that the

environment serves only as a stimulus to the specific language forms. This theory was based on the assumption that the linguistic data available to the child were complex, fragmented and unsystematic, thus unsuitable as a language learning model. However, recent research has demonstrated that this assumption is largely false. Language addressed to children is predictably different from that among adults. Modifications are found in syntactic, semantic, discourse, and functional aspects of child addressed language.

#### Nature of Adult Speech to Children

During the late 1960's and the '70's, numerous studies of the child's language environment confirmed the earlier observations of Brown and Bellugi (1964) that parents' language to children is short, simple, well-formed, and repetitive. Initial investigations dealt with the syntactic and semantic nature of language to children and how it differed from the language among adults. With respect to formal syntactic aspects of adult-child language, it has been found that utterances directed to children are short in length (mean length and pre-verb length), reduced in complexity, and are largely grammatically well-formed (Snow, 1972, Broen, 1972, Nelson, 1973, Shatz and Gelman, 1973, Newport, 1976, Vorster, 1975, Phillips, 1973, Remick, 1973, Baldwin and Baldwin, 1973, Cross, 1977). It was also noted that children hear more one word utterances (Broen, 1972,

Snow, 1972, Newport, 1976), fewer coordinate and subordinate clauses (Shatz and Gelman, 1973, Phillips, 1973), and less frequent modifiers and pronouns (Newport, 1976). When pronouns are used they frequently have concrete physical referents (Remick, 1973). Furthermore, there is a slower rate of speech, greater intelligibility and fluency, and a tendency towards use of distinct pauses between utterances (Broen, 1972, Remick, 1973, Cross, 1977, Newport, 1976). Remick (1973) and Garnica (1977) also demonstrated that adults use higher pitch in their speech to children than to adults. With respect to word order, Buuim (1974) reported that, in an unordered language (Hebrew), a father tended to produce predominantly subject-verb-object with his two year old daughter but varied the order of these constituents with adults.

With respect to semantic modifications, a number of studies reported that lexical diversity is reduced in adults' speech to children (Remick, 1973, Phillips, 1973, Broen, 1972). Cross (1977) and Nelson (1973) noted that the referential field of maternal utterances is primarily the here and now, and verb tense analysis reveals few references to the past or future (Shatz and Gelman, 1973, Remick, 1973). Using semantic categories as defined by Brown (1973), Snow (1974) noted that the majority of semantic relations expressed by mothers were the same as those that Brown identified in early child language. Levinson (1979) further noted that mothers and their children used similar

relative frequencies of various semantic/syntactic relations during their interactions.

In addition to the syntactic and semantic features of language addressed to children already described, investigations of discourse aspects and communicative functions of adult-child language have been undertaken. Though interest in this area is relatively recent, some general characterizations of these aspects of adult language to children can be made by the available evidence.

Mothers appear successful in maintaining verbal turn-taking with their children early in their linguistic development. the mother and infant engage in vocal-verbal exchanges even before the child begins to use language (Stern, Jaffe, Beebe, Bennet, 1975, Bateson, 1975, Schaffer, Collis and Parsons, 1977, and Snow, 1977, 1978). Once language emerges in the child, a majority of mothers' verbal responses are semantically related to the child's utterance (Cross, 1977, Levinson, 1979). These responses take the form of complete or partial repetitions, expansions, and extensions of the child's utterances and frequent self-repetitions of her own utterances. Levinson (1979) further noted that mothers most often maintain the semantic/syntactic relations expressed in the immediately preceding child utterance. Thus, mothers generally attend to the semantic intention of the child by continuing the topic in their utterance. In contrast, new topic responses are relatively rare.

The functional nature of maternal speech to children also differentiates it from speech among adults. Mothers' utterances more often function to direct the child's behavior, taking the form of direct imperatives and indirect statement and question forms (Blount, 1972, Nelson, 1973, Newport, 1976, Shatz and Gelman, 1973).

Questions occur more in parents' speech to their children than among adults and make up a large proportion of mother-child language (Holzman, 1972, Newport, 1976, Cross, 1977, 1978). These forms perform a variety of different functions (Brown, Cazden, and Bellugi, 1969, Moerk, 1974, Ervin-Tripp and Miller, 1977, Holzman, 1972, Shatz, 1979). Shatz (1979) identified eleven functions that questions to children serve; the most common are those that test the child's informational knowledge, request information, or generally fill in as a conversational turn while passing the turn back to the child. Shatz further noted that as children grow they are exposed to fewer questions as directives and more questions to request specific information.

Nelson (1973) reported that a number of maternal utterances to children function to comment on the child's present activity, whereas references to the mother's activity are rare.

Another unique property of maternal speech to children is the frequent presence of a deictic function (Newport, 1976). This is often manifested in sentence forms with verb

"be" used both to name and describe (Broen, 1972). Newport (1976) suggested that the use of these corresponded to the child's interest in naming.

A small proportion of maternal utterances also have been identified as serving a direct teaching function. Mothers correct children's utterances chiefly when semantic errors are noted (Brown, Cazden, and Bellugi, 1969, Levinson, 1979). Corrections for phonological and grammatical errors have also been noted by Moerk (1972, 1974). He identified a prodding characteristic where the child was asked directly to say a particular word, "say it better", or to correct an incorrect grammatical form. He also noted the use of incomplete sentences as a teaching device to elicit words (to complete the sentence) from children.

In summary, it has been established that mothers modify syntactic, semantic, discourse and functional aspects of their language when speaking to children. These characteristics of maternal language result in considerable simplifications that are often predictable and change as the child gradually masters the linguistic code and conventions of his environment (Bellinger, 1980, Broen, 1972, Cross, 1977, Fraser and Roberts, 1975, Lasky and Klopp, 1982, Phillips, 1973, Remick, 1973, Snow, 1972). Underlying these modifications are thought to be maternal motivations to engage the child in conversation, insure communication, teach language, or direct or control the child's behaviors.

Factors that influence and guide these modifications, and their effect on the child's language learning are discussed in the following sections.

#### Factors Influencing Modifications in Adult-Child Language

A number of factors have been postulated as influencing the modifications found in language addressed to children. These include characteristics of the child such as age, linguistic abilities, and cognitive maturity. The adult's perceptions and beliefs about the child's needs and abilities are also thought to play a role in determining the nature of adult-child language. Finally, it has been suggested that the adult's interactional intent strongly influences the language addressed to children. Evidence for the respective contributions of each of these factors is discussed below.

#### Linguistic Development

Modifications adults make in their language vary with the age and linguistic maturity of the child (Bellinger, 1980, Schneidermann, 1983, Blount, 1972, Broen, 1972, Brown, Cazden and Bellugi, 1969, Fraser and Roberts, 1975, Phillips, 1973, Remick, 1973, Snow, 1972). This finding has led a number of researchers to suggest that adults are sensitive to the linguistic abilities of their listener and adjust their language accordingly. The hypothesis that adult's "fine tune" their language to the child's linguistic

abilities has been used to support the notion that the environment plays a significant role in the child's language acquisition.

Early evidence for this hypothesis was provided by Phillips (1973) who studied maternal language to three groups of children, 8, 18, and 28 months of age. She reported a number of significant differences in the mothers' speech to 18 vs. 28 month old children: length of utterances, number of verbs, verb forms, and modifiers per utterance, and type token ratio. Though no features of maternal speech to 8 vs 18 month old children were found to differ significantly, Phillips noted that the 8 month olds were exposed to language that showed a greater degree of variability than the speech to older children. Based on her findings, Phillips argued that mothers adjust their speech complexity to the language level of the child and that these adjustments begin when the child is able to respond linguistically. This position received support from Gleason (1977), who found that mothers modify their language in part based on cues of attention and comprehension from the child. Shipley, Smith, and Gleitman (1969) also noted that children do not respond to excessively complex or unfamiliar speech.

Cross (1977) presented further evidence for the relationship between a number of maternal speech features and various indices of children's speech production and comprehension abilities. She examined discourse,

referential, and syntactic aspects of maternal speech to children who ranged in age from 19 to 32 months. The maternal language features that showed highly significant correlations to the child's language abilities were those representing discourse and referential aspects of maternal speech.<sup>1</sup> Her results revealed that the child in the early stages of language learning heard more utterances which were related to their child's topic, referred to the immediate context, and were frequently repeated. The relative frequency of each of these aspects of the mother's language decreased with the child's increasing language abilities. Though correlations of these features with the children's age were also significant, they were not generally as high. On the other hand, syntactic features of the mothers' speech, with the exception of MLU, did not correlate significantly with any aspects of the child's linguistic development or age. Cross concluded that mothers finely tune discourse and semantic aspects of their speech to the child's developing linguistic abilities more so than to age. She argued that these maternal speech adjustments give linguistic expression to the child's immediate interest, intention, and understanding, and therefore "provide the child with ideal opportunities to learn the structure of

<sup>1</sup> The measures of the child's language abilities showing the highest correlations with these maternal language features were comprehension abilities and mean length of the longest 50 utterances.

his language" (p. 171). Cross added that syntactic modifications are only grossly adjusted to the child's development and may simply bring the complexity of the input within reach of the child's processing capacities (Cross, 1977).

Van Kleeck and Carpenter (1980) attempted to examine the specific influence of children's language comprehension abilities on semantic/syntactic, contextual, and functional parameters of adult language. Their subjects were children who differed in their language comprehension abilities, but were similar in age, expressive language, and cognitive maturity. To create these conditions the authors selected four language impaired children, two with "high" comprehension and two with "low" comprehension. All of the children demonstrated cognitive abilities within the normal range and expressively were functioning at the single word stage. Their findings indicated that while adults provide significantly more nonverbal cues, fewer nonpresent references, less lexical diversity, and fewer utterances encoding the content category 'state' to children with poorer comprehension, they do not adjust many other linguistic aspects specifically to the child's comprehension. They conclude that the child's comprehension is a factor influencing certain parameters of adult input to children but it alone does not fully determine many of the adjustments that adults make when speaking to children.

Levinson (1979), in a study of maternal response to

children's utterances, found that a number of maternal responses are influenced by syntactic and semantic aspects of their child's expressive productions. For example, a child's single word utterances were most frequently followed by a related question, grammatically incomplete utterances were most often followed by an expansion, and semantically inaccurate utterances were corrected more frequently than syntactically inaccurate utterances. She also noted that mothers most frequently retained the semantic/syntactic content of the child's previous utterance in her response.

Similarly, Lieven (1978b) suggested that the quality of the child's linguistic productions influence adult-child conversations. She examined the linguistic interaction of two children, Beth and Kate, with their mothers and noted that individual characteristics of the child's language related to features of the mother's speech directed to them. For example, Beth's utterances were quite repetitive, and appeared to be used primarily to gain her mother's attention rather than to encode informative elements in her environment. In response to Beth, her mother was unlikely to expand or extend her utterance or ask a related question; she supplied more "ready-made" responses (such as "oh", "yes", "really"), and she also frequently ignored or corrected her child's utterances. In contrast, Kate talked informatively about a variety of objects and activities in her environment. In response, her mother frequently expanded and extended her utterances, asked related

questions, and was less likely to ignore or correct what Kate said. Further, Lieven found that the individual differences noted in the mothers' speech to their child were also evident when she, the investigator, interacted with the children. Lieven concluded that children, by virtue of the way that they talk, may be influencing the way in which parents and other people speak to them.

This hypothesis that the linguistic abilities of the child influence adults to modify their child-directed speech predicts that the child with specific deficits in the development of language would hear speech not unlike that directed to the younger normally developing child with a similar linguistic style. Studies of maternal language directed to these children have provided some support for this hypothesis (Rondal, 1978, Lasky and Klopp, 1982, Conti-Ramsden and Friel-Patti, 1983). However, certain discourse, functional, and semantic aspects of mothers' language during interaction with these children have been found to differ significantly from that experienced by normal children. This has led some researchers to suggest that the child with a language disorder is exposed to a linguistic environment that is qualitatively different from that expressed to normal children and non-conducive to their language development (Wulbert, Inglis, Kriegsmann, and Mills, 1975, Bondurant, Romeo, and Kretschmer, 1983, Newhoff and Millet, 1978, Peterson and Sherrod, 1982).

Cramblit and Siegel (1977) examined formal aspects of

the linguistic input of a mother, father, and aunt to a 4.7 year old language disordered boy and his 4.6 year old normally developing female cousin. No data was provided on the linguistic or nonlinguistic abilities of these children. Their results revealed that the language disordered child was exposed to a verbal environment different from that directed to the normal child. Linguistic input to the language disordered child was characterized by a greater amount of speech (more words/minute and more total sentences), more fluency, a lower MLR and TTR, more imperatives, single word responses and repetitions, and fewer questions and incomplete utterances. Bondurant, Romeo, and Kretschmer (1983) confirmed many of these results with a larger group of children (N=14) demonstrating a specific expressive language disorder. When compared to normally developing children of the same age, they reported that the language disordered children heard shorter utterances, fewer questions, and more directives and rejections. They infer that these modifications may be a factor impeding the children's language learning. However, they also acknowledge that the differences may be due to the disordered child's language level which is more similar to that of a younger child.

In order to account for differences in the language abilities of normal and language disordered children, studies have matched children on the basis of their language

level; mean length of utterance (MLU) has been the matching criterion most used. Rondal (1978) examined maternal input to mentally retarded Down's syndrome children and normal children who were matched on the basis of their MLU. An analysis of the mothers' speech into categories coding lexical, syntactic, semantic-structural and semantic-pragmatic features revealed no significant differences between the language addressed to the two groups of children. Rondal concluded that maternal language is adjusted to the child's linguistic level thereby enhancing the child's potential for language learning. However, since these children were mentally retarded, it is not possible to rule out whether their cognitive immaturity also played a role in determining the mother's language.

Studies of children with a specific deficit in the area of language development have allowed one to rule out the effect of nonlinguistic cognitive maturity when comparing the speech of mothers to language disordered and normal children. Newhoff and Millet (1978) examined the linguistic environment of language disordered and normal children who were matched on the basis of their MLU. The normal children were therefore younger in age than the disordered. The nine language disordered children were described as exhibiting a reduced expressive MLU with no evidence of hearing loss, mental retardation, or emotional or neurological problems. However, no evidence was provided for normalcy of nonlinguistic abilities and there was no description of the

children's language other than expressive length of utterance. Similarly, the only description of the normal children included their age and MLU. It is not known whether the children were matched for socioeconomic level, sex, or birth order.

Each mother-child dyad was audiotaped for 15 minutes of free play interaction in a laboratory setting. The mothers' language to their child was examined specifically for a few of those features which had been identified as facilitative of language growth. These features were semantically related responses, unintelligible utterances, affirmative imperatives, deictic utterances, and auxiliary fronted yes-no questions. Their results indicated that two of the features significantly differentiated the two groups; the language disordered child was exposed to fewer semantically related responses and more unintelligible utterances. In a subsequent paper, Silverman and Newhoff (1979) reported the findings of a study in which they examined the same five features in father's speech to their language disordered children and fathers' speech to their normally developing children. The nine children in each group were similar in age and MLU to the language disordered and normal children in the Millet et. al. study and the procedures for data collection were also similar. The subjects were not matched for SES, sex or birth order. The results indicated no significant differences in any of the five parameters analyzed, however trends noted were similar to

those differences demonstrated by the mothers in Newhoff and Millet (1978). These studies will be discussed further in a following section of this paper dealing with speech to children and its effect on language learning.

Lasky and Klopp (1982) examined verbal and nonverbal communication patterns in mothers' interactions with normal and language disordered children. The children in the normal and disordered groups were roughly matched for language level on the basis of their combined language age on the Receptive-Expressive Emergent Language Scale (REEL) (Bzoch and League, 1970). These children were otherwise described as having no neurological or hearing problems and no evidence of mental retardation. No data on their cognitive abilities was provided. The features of the mothers' verbal interactions studied included verbal responses such as imitations, acknowledgements, and functional features such as questions, commands, and tutorial modeling (defined as language eliciting directives). The results of this study demonstrated that there were no differences between the groups in the mothers' frequency of use of these interaction features. However, in the normal group, the frequency of mothers' use of such features as expansions, questions, acknowledgements, information-providing utterances, and total nonverbal behaviors were related to some measures of the child's language maturity. These correlations were not found in the language disordered group. They concluded that mothers of

language disordered children are less likely to adjust their interaction patterns to the child's linguistic abilities than are mothers of normal children. However, it should be noted that out of the seven language disordered subjects studied, three were at a primarily nonverbal stage of development (12 months or below on the REEL expressive portion), whereas only one of the ten normal subjects was nonverbal. Since, as previously noted, Phillips (1973) found more variability in mothers' speech before children reached the linguistic stage, it may be that this variability contributed to the nonsignificant correlations found in the language disordered group.

Petersen and Sherrod (1982) examined maternal language characteristics with Down's syndrome, language delayed, and normal children; each group was matched on the basis of MLU. Their analysis indicated that the mothers of language delayed children produced a number of formal, semantic and functional features similar to those heard by both Down's syndrome and normally developing children.

Finally, Conti-Ramsden and Friel-Patti (1983) also provided evidence for the influence of the linguistic level of the language-impaired child on functional aspects of mothers' language. In their study of maternal speech acts to 14 language-impaired and 14 non-language-impaired children matched for language level (analyzed from a 5 minute period of free play interaction), they found no significant differences between the two groups of mothers in

their use of requestives (choice, product, process questions), assertives (identifications, descriptions, explanations, evaluations), directives (indirect and direct), responsives (answers and acknowledgements), and regulatives (attention getters, requests for clarification). The only difference approaching significance was the tendency of mothers of language impaired children to initiate dialogue more than the other group of mothers. Since the language-impaired children also initiated conversation less than their non-language-impaired counterparts, the authors suggested that this maternal discourse adjustment was particularly appropriate as it served to aid in establishing and maintaining the conversation.

In summary, the linguistic development of the child has been suggested to be a primary factor in shaping the modifications found in adults' child-directed speech. Studies of language disordered children, however, have indicated that linguistic development may not fully account for the nature of speech directed to these children.

#### Cognitive Development

Newport (1976) and Shatz and Gelman (1977) proposed that the child's cognitive level of development plays a primary role in determining the properties of adult-child speech. These researchers suggested that the child's nonlinguistic cognitive deficits place constraints on the topic and

function of the conversation, and it is these conversational constraints which yield the simplifications in the speech children hear. This position denies that the child's linguistic environment is closely tuned to the child's linguistic capacities, and, as a result, does not function as a language teaching model (Newport, Gleitman, and Gleitman, 1977).

Newport's conclusions were based on a correlational study relating parameters of maternal language to children's age and several measures of linguistic development including MLU and vocabulary. Results of her study revealed low correlations between syntactic aspects of the mothers' language and the age and linguistic level of the child. An exception to this was the mothers' MLU which was found to be significantly correlated to age. Newport attributed this correlation to the fact that mothers were less likely to delete constituents when speaking to older children, rather than to an increase in syntactic complexity. On the other hand, a number of significant correlations were found relating the frequency of maternal sentence types, deictic expressions, and use of repetitions to the children's age and several measures of language development. For example, mothers' use of imperatives was negatively correlated with the children's age and all measures of linguistic maturity, whereas use of declaratives was positively correlated with age, MLU and noun phrase length. Mothers' use of deictic expressions (to name an object or action) correlated

significantly with the children's vocabulary size. In addition, the frequency of maternal repetitions of their own utterances decreased with the children's increasing age and language abilities and mothers' repetitions of their children's utterances (particularly when containing additional information) was positively related to the age and language development of the children.

Newport attributed the mothers' use of various sentence types to the functional basis of the conversation, and the mothers' MLU and use of repetitions to the processing limitations of the child. She argued that these conversational adjustments are determined by the child's age and concomitant cognitive maturity. Newport concluded that mothers' language is not simplified for acquiring syntax but for the convenience of the mother in maintaining conversational interaction with a cognitively immature child. In stating these conclusions, however, Newport fails to consider the relationships found between the mothers' use of self repetitions, repetitions, and extensions of the child, and a number of measures of the children's language maturity. It was these features that Cross (1977) argued were adjusted to the child's linguistic capabilities and important for language learning.

Shatz and Gelman (1977) also claimed that, in part, children's cognitive maturity places constraints on the conversational interaction of others and thereby influences modifications in the language addressed to them. They

stated that "the ways in which these constraints influence the speakers output depend on the specific communicative demands of a given situation as well as the cognitive-social status of the given participants in an interaction" (p. 189). This position is based on data from Shatz and Gelman (1973) showing that a four year old generally directed shorter and simpler utterances to a two year old than they did to an adult. They attributed this finding to the constraints on functional meanings of utterances to the different listeners. For example, the four year old typically directed the behavior of the two year old but did not do so with an adult even when the communicative situation (how to use a toy) remained the same. To illustrate this further, Shatz and Gelman (1977) used the same data to demonstrate that even when syntactically more complex utterances were used by the four-year-old to communicate with the two-year-old, they remained conversationally simpler than those expressed to an adult. This is evident in the four-year-old's use of 'that' and 'wh-' predicate complement utterances; the four-year-olds used these constructions in utterances to direct the interaction when speaking to two-year-olds, but used them to talk about mental state and qualifications of propositional certainty with adults. They pointed out that "given the cognitive limitations of a two-year-old, abstract talk about mental state and qualifications of propositional uncertainty would be inappropriate." (p. 194). Therefore, they

concluded that it is conversational simplicity geared to the cognitive abilities of their listeners that results in modifications in the speech to the younger children.

The hypothesis that children's nonlinguistic cognitive abilities influence an adult's linguistic input and interaction predicts that the child with a specific language disorder will be exposed to language similar to that directed to a child of the same age and cognitive level of maturity (since the child with a specific language disorder by definition has normal or above normal age-level cognitive abilities). Van Kleeck and Carpenter (1980), in a post hoc analysis of data from their preliminary and main experiments discussed in the previous section, attempted to determine whether the child's nonverbal cognitive level of development had an effect on selected semantic and syntactic aspects of child-directed talk. They compared adults' language directed to two developmentally delayed children with that addressed to two language disordered children who had low average cognitive abilities and significant deficits in their language development. They indicated that the two groups of children were similar in age and language abilities (both receptive and expressive), but differed substantially in their nonverbal cognitive level of development. In their analysis they compared only the variables MLU, mean number of semantic categories per utterance, and number of utterances with no verb. Their findings indicated that there were no significant differences in these aspects of

the language addressed to the two groups of children. They concluded therefore that nonlinguistic cognitive maturity was not a factor influencing adult-child speech. However, there are some interesting general trends noted in the data provided by Van Kleeck and Carpenter on the adults' use of semantic/syntactic categories which were not included in the statistical comparisons of speech directed to the two groups. For example, there are more utterances in each of the higher-level semantic/syntactic categories including time, coordinate, causality, and epistemic (Bloom and Lahey, 1978) directed to the children with more mature cognitive abilities. There are also fewer adult self repetitions, expansions and reductions, more references to the nonpresent context, and less nonverbal cueing in the speech to children with higher cognitive abilities. These trends indicate that there may be important differences in the language addressed to children who differ in their cognitive abilities that were not captured by the categories selected for statistical comparison by the authors.

If cognitive abilities play a role in determining aspects of speech to children, then differences that have been found in language addressed to children with a specific language disorder and younger normal children with similar language abilities may be accounted for by the difference in age or higher level cognitive maturity of the disordered child. Studies of the linguistic environment of these children thus far have considered only the age-matched or

the language-matched normal child for comparison in concluding qualitative differences. Thus, there is a need for including both age matched peers and younger language matched children in studies of language disordered children.

#### Adult Interaction Strategy

There are reported differences in the ways adults speak to children that cannot be accounted for by the developmental abilities or other behaviors of the child. Studies of various cultures have pointed out that adults' attitudes and beliefs about children influence certain aspects of the language addressed to them. For example, Blount (1972) found that in Luo and Samoan cultures parents direct their child's activities and verbal responses more so than middle class American parents. He attributed this difference to the parents' concept of the child's social status and abilities in the two cultures; the Luo and Samoan parents consider children social inferiors and do not expect them to initiate activities whereas the American parents generally look upon their children as social equals, capable of making decisions and initiating interaction.

It has also been suggested that within cultures, differences found in adults speech to children may be influenced by the adults' beliefs about the child's needs and abilities. Snow (1977) cited a study by Bingham (1971) which revealed that adults simplified speech to prelingual children if they believed the child was cognitively advanced

and capable of understanding language. Adults who did not believe this did not similarly simplify their input language.

Gleason and Weintraub (1978) indicated that parents have stereotypical notions about what children know which likely affects the language they address to them. Based on the answers parents gave to questions regarding what their children know, feel and prefer they concluded the following:

There is some evidence that while feedback helps to shape parental input, feedback by itself is not a sufficient explanation for the phenomena of modified speech to children. Instead, adults seem to have internalized stereotyped exemplars of the competencies of children at different ages and fairly limited ideas of what is appealing and interesting to children at different ages. Parents rely upon these stereotyped notions as a general guide to modifying their speech to young children and then make fine adjustments on the basis of their particularistic knowledge about their own children (p. 213).

It should also be noted that parents' willingness to communicate and converse with children also probably affects the way they interact linguistically with their children. As has been pointed out by Brown (1977) and others (e.g. Cross, 1977, Levinson, 1979, Moerk, 1976, Newport, 1976, Snow, 1977) the special properties of adults speech to children appear to be motivated by the parents desires to be understood, to engage the child in conversation, and secondarily to "teach" language. Differences in their speech to children thus may be influenced by varying motivations as they communicate with their children.

McDonald and Pien (1981) identified two maternal linguistic interaction styles which they suggest strongly

reflect individual variation in maternal interactional intent. Using functional categories to code mothers' speech to their 2;5 to 3;0 year old children they found two negatively related clusters. These clusters were thought to reflect two different maternal interactional motivations; one, to elicit conversational participation from the child and two, to control and direct the child's physical behaviors. Olsen-Fulero (1983) later confirmed that these clusters were useful in characterizing stylistic differences among mothers, and furthermore, found that these remained stable across two sessions (recorded between 2 and 7 days apart). Though acknowledging the child's influence on the mother's language at various ages and stages of language development, these studies suggested that the differences they found are solely attributable to the maternal interactional intent either to direct or converse with their child.

In an attempt to sort out elements of maternal speech that were responsive to the child and those based on interactional strategy, Smolak and Weintraub (1983) studied mothers' speech to their two-year-old daughters who were divided into two groups based on their level of language development (high vs. low). These mothers then were each sampled interacting with another girl of the same age as their daughters to determine whether the differences in the mothers' language to their own children were evident when each addressed the same child. Based on their findings,

they suggest that though the mothers' speech to all the children was surprisingly consistent, both responsive and strategic elements emerged. Such features as maternal self repetitions, number of pronouns per utterance, responses to child expressive and learning statements, and use of ego-enhancing statements were found to be responsive to the child's language level. Strategic aspects included the amount of speech directed to the child and the amount of repetitions of the child's utterances, features which have been positively associated with language facilitation.

Aspects of child-directed speech resulting from adults' attitudes and beliefs and interactional motivations have particular significance when considering adults' speech to the child with a language disorder. It has been inferred that the linguistic environment of these children may be detrimental to their language learning (Wulbert, Inglis, Kriegsmann, and Mills, 1975, Petersen and Sherrod, 1982). And, as suggested by Newhoff, Silverman, and Millet (1980) these children may present a confusing picture to parents because of their linguistic deficits. These factors may result in the differences that have been found in the speech to language disordered vs. normally developing children.

In summary, there is evidence to suggest that there are many factors operating to influence maternal speech to children. In regard to the child with a specific language disorder, there are discrepancies in their age and

nonlinguistic abilities when compared to their linguistic development. Furthermore, their attention, behavior, and ability to provide communicative feedback to adults may be different from that of the normally developing child. In addition, parents perceptions of the child's abilities may be confused; this coupled with their knowledge that their child has a disorder may influence their interaction. All of these factors must be considered when investigating factors which influence the nature and quality of the linguistic interaction provided to the child with a specific language disorder.

#### Speech to Children and Language Acquisition

The nature of adults' child-addressed language as described above, including syntactic and semantic simplicity, context relatedness, and redundancy, seem to make it an ideal source for language learning. A number of investigators have suggested that it is well-tailored to the child's language learning needs; Snow (1972) characterized mothers' speech to children as a well-designed set of "language lessons" and Vorster (1975) argued that the evidence overwhelmingly points to the child's linguistic environment as a model for language acquisition. Recently, studies have attempted to substantiate these notions by identifying specific speech characteristics that contribute to the child's rate of language acquisition.

The syntactic modifications found in adult-child

language such as well-formedness, simplicity, and short utterance length probably make language learning easier for the child (Furrow, Nelson, and Benedict, 1979). Also, the frequencies of certain specific syntactic elements in the parents' speech have been regarded as facilitating their acquisition in the child (Newport Gleitman, and Gleitman, 1977, Moerk, 1981, Buium, 1974, Whitehurst, Ironsmith, and Goldfein, 1974). However, based on a number of recent studies it is now believed that syntactic modifications are only grossly adjusted to the child's age and developing linguistic capacities, and that they appear to function to bring language within reach of the child's processing capacities (Cross, 1977, 1978, Newport, 1976, Shipley, Smith, and Gleitman, 1969). On the other hand, it appears that semantic and discourse aspects, some of which are finely tuned to the child's developing abilities, along with functional aspects of maternal language behavior have the greatest impact on the child's language learning. It is these aspects of maternal language that have been found to differ in the language of mothers to children with a specific language disorder. Unfortunately the literature dealing with this topic has been limited and results of many studies have been contradictory. The evidence linking these features of maternal language to the normal child's rate of language learning and their presence in the environment of language disordered children will be discussed below.

### Maternal Response Style

Early studies by Cazden (1965) and Nelson, Carskaddon, and Bonvillian (1973) aimed experimentally to manipulate adult verbal responses to children and observe the subsequent effect on their language growth. Cazden (1965) hypothesized that adult expansions of children's language would facilitate language learning by providing optimal data for the acquisition of grammar. Three groups of children participated in this study; one exclusively received expansions<sup>1</sup> of their utterances, the second were exposed to language modeling<sup>2</sup>, and the third was a control group which received no treatment. Contrary to expectations, modeling resulted in the most marked improvement in the children's language, with expansions next, and the control group showed the least improvement. None of the differences were significant. Commenting on these results, Brown, Cazden, and Bellugi (1969) speculated that the richness of the modeling technique may sustain the child's attention and be more appropriate for conversation than expansions alone. A study by Nelson, Carskaddon, and Bonvillian (1973) found

<sup>1</sup>Expansion was defined as a response which expresses the meaning of the child's previous utterance (as the adult understands it) but in syntactically complete form, e.g. C: Dog run away, A: Yes, the dog is running away.

<sup>2</sup>Cazden (1972 later stated that a more accurate term for modeling is "extension"; these are responses which "presuppose a particular expansion, but then build out from it along some dimension of meaning" (p. 125), e.g. C: Dog run away, A: Yes, but he'll come back soon.

that expansions, in some circumstances, can influence language growth. They provided recast sentences responses to one group of preschool children which included expansions of the child's incomplete utterances and responses to complete utterances in a different syntactic form. Thus, in the response, content was constant but a different syntactic means of encoding it was used. Another group received new sentence responses which did not contain any content words from the child's utterance. A third group, serving as the control, received no treatment. When evaluated later, the recast sentence group was significantly ahead on all the language measures used. Nelson et. al. suggested it was the novelty of the recast sentence expansions provided in the Cazden study which may have better maintained the child's attention unlike the expansions provided in the Cazden study.

To examine further features of adult speech that facilitate language, Cross (1978) studied maternal language to two groups of children during natural interactive play sessions in the home. Though the children in each group were equivalent in language level, they differed in age; thus the younger group was considered accelerated in language acquisition, while the older group was considered normal. By comparing syntactic, referential, and discourse features of maternal language to the two groups, Cross proposed to isolate those features that facilitate the rate of language learning. Results of this study indicated that

the accelerated language group received significantly more semantically related responses to their utterances and fewer unintelligible utterances. Cross failed to find any differences in syntactic parameters in the speech addressed to the two groups. With regard to verbal responses, she interpreted her results as indicating that semantic simplicity and relatedness in the mother's speech facilitates the acquisition of language. That is, the mother, by repeating, expanding and extending<sup>1</sup> the child's utterances, maintains his semantic intention thereby enabling him to "comprehend the meaning and also see the relationship between his characteristic mode of expressing it and the more sophisticated version" (p. 181). Wells (1980a) provided longitudinal data in support of this interpretation. He found that mothers who responded more frequently with topic related utterances had children who acquired language at a faster rate. He suggested that such conversational interactions facilitate language learning because they allow the child to entertain the meaning of an utterance while hearing an appropriate linguistic encoding of it.

One of the first studies of the environment of children with a specific language disorder did not specifically address linguistic aspects, but reported findings relevant

<sup>1</sup>This refers to the category "semantic extensions", which, following Cazden (1972), is defined as a response which incorporates a contentive lexical item from the child's previous utterance but adds meaning to it.

to the study of these children's language environment. Wulbert, Inglis, Kriegsman and Mills (1975) investigated the daily home environments of three groups of children - language disordered, Down's syndrome, and normal - and their mothers. The subjects represented a normal distribution of socioeconomic levels. The authors stated that they were seeking maternal variables in the home which may affect a child's language development and that are not tied to socioeconomic factors. The 20 children with a specific language disorder ranged in age from 2,5 to 6 years and were identified by normal performance on the Leiter International Performance Scale (a measure of nonlinguistic skills) and below average performance on the Stanford-Binet Intelligence Scale (a measure of language and nonlinguistic abilities). The 20 normal children were matched by age, sex, birth order and socioeconomic status to the language disordered children, and their mean scores were within normal limits on the Leiter and slightly above average on the Stanford-Binet. The 20 Down's syndrome children were somewhat younger in age than the other groups of children and were considered mentally retarded although no test data was given. The Caldwell Inventory of Home Stimulation, a 48 item test designed to evaluate the quality of the child's daily home environment, was used as the dependent measure. Results of this study indicated a number of significant differences between the language disordered children and the normal group; the greatest discrepancies occurred on three

categories of the home environment which deal directly with mother-child interaction. In general, these categories concern the emotional and verbal responses of the mother, the use of punishment, and the maternal involvement with the child. The scores indicated that the mothers of language disordered children were less positive, less warm and accepting, quicker to shout, threaten or punish, and less likely to interact with their children, other than to meet their physical needs. These differences were not found when comparing the data on the Down's syndrome children to the normal, and no differences were found among the various socioeconomic strata. The authors concluded from these results that mothers do not behave differently to children who are diagnosed as developmentally deviant, but do provide a measurably different home environment to children with a specific deficit in the language area. They speculated that the poor interaction in the language disordered child's environment was established before the deficit was recognized by the mothers, but they cited no evidence on which to base this notion. Wulbert et. al. argued that language development of children may be particularly vulnerable to parameters of mother-child interaction as measured by the Caldwell Inventory of Home Stimulation. Based on their results they advise clinical intervention aimed at improving maternal interaction with language disordered children. Little consideration is given to the role of the child in influencing these characteristics of

their environment.

Petersen and Sherrod (1982) in a study mentioned previously, examined the linguistic aspects of the environment of the same three groups of children as the Wulbert et. al. study, that is language delayed, Down's syndrome, and normally developing children. They found that though there were many similar features in the maternal linguistic environment there was one important difference. Mothers of language delayed children produced more utterances which were semantically unrelated to the child's utterance or activity than either of the other two groups of mothers. They suggest that, in the absence of organic or intellectual deficits in the child, this "breakdown" in communication is caused by the mother and may be an explanation for their children's language lag.

As previously pointed out, Newhoff and Millet (1978) and Silverman and Newhoff (1979) found similar results. They noted that the environment provided by parents to their children with a specific language disorder contains significantly fewer semantically related responses<sup>1</sup> than

<sup>1</sup>The relative frequency of occurrence of semantically related responses for both groups is considerably less than that noted by Cross (1977, 1978) for normal children of a similar age and language level. Newhoff and Millet reported that this variable accounts for only 20 to 32 percent of the responses to language disordered and normal children respectively, whereas this category accounted for approximately 50 percent of the responses found in Cross. Differences in the setting and the amount of data analyzed may have accounted for this. Cross collected her data in the home and used 300 maternal utterances selected from a larger sample, whereas Newhoff and Millet collected their data in an experimental setting and analyzed less than half that amount of utterances.

the linguistic environment of normally developing children. This feature has been associated with a rapid rate of language learning in normally developing children. Newhoff, Silverman and Millet (1980) to concluded that parents of language disordered children interact in a manner which is qualitatively different from that experienced by the normal child; most important, they are less sensitive to the semantic intention of their child. This interpretation, however, is not entirely substantiated by the findings. In the Newhoff et. al. study a semantically related response must incorporate at least one lexical form from the child's utterance either exactly or in pronoun form (as in Cross, 1977, 1978). Since it is possible for a response to be semantically related without using a contentive from the previous utterance (Bloom, Rocissano, and Hood, 1976, Wells, 1980, Levinson, 1979) and because semantically related responses accounted for only a small proportion (20 to 32 percent) of the maternal responses, it appears necessary to determine the nature of the remaining responses and examine other parameters of maternal language before concluding that parents are less sensitive to the child's interest, and in order to adequately describe and evaluate the linguistic environment of language disordered children.

Furthermore, since these studies only matched the children by language level, it is not clear whether the parents were being responsive to the child's age and

nonlinguistic cognitive maturity.<sup>1</sup> If the parent of the language disordered child is thus influenced by age and concomitant cognitive abilities, then comparison to the normal child of the same age is needed to substantiate the conclusion that these parents provide input qualitatively different than that of normally developing children.

#### Functions of Maternal Language

A functional aspect of language interaction suggested to influence language acquisition is the amount of maternal directiveness (Clarke-Stewart, VanderStoep, and Killian, 1979, Kaye and Charney, 1981, Nelson, 1973). Nelson (1973), in a longitudinal study of mother-child interaction, found a relationship between the amount of maternal direction and rate of language acquisition; mothers who were more directive had children who acquired language at a slower rate. Similarly, Clarke-Stewart et. al. (1979) and Clarke-Stewart (1973) found a relationship between maternal control, (i.e., their use of directives) and their child's rate of language and intellectual development. Kaye and Charney (1981) provide further support for this relationship. They reported a significant negative correlation between mothers' use of mands (defined as an utterance that requires a response such as directions, requests, and questions) and later scores on a measure of

<sup>1</sup>Cross (1977) demonstrated with normal children that there is a very significant negative correlation between the use of this feature and the child's age and receptive abilities.

receptive vocabulary and a puzzle solving task. They indicated, however, that they cannot claim a causal relationship since the child's earlier language abilities also highly predicted their scores on these measures. Even so, it is of interest that maternal directiveness and child language development appear to covary. An observation made by both Nelson and Kaye et. al. is that directive use is associated with a particular maternal linguistic style. Nelson described it as behavior-oriented, intrusive, discursive style. Mothers who were more highly directive also indicated more rejection and disapproval of the child's verbal and nonverbal behaviors. This was also noted by Bondurant et. al. (1983) in the language of mothers of language disordered children. McDonald and Pien (1981) added that mothers who use more directives use fewer language devices appropriate to conversational elicitation and vice-versa, and it appears that this style of maternal interaction remains stable over a short period of time (Olsen-Fulero, 1983). Thus, it appears that mothers who are more directive also may be less successful at engaging their child in conversation, a factor which has been suggested as important to language acquisition (Lieven, 1978a, 1978b, Snow, 1978).

Studies of the language disordered child have also indicated that parents are more directive and controlling of their child's behavior than parents of normally developing children. Many of them have suggested that this aspect of

the mothers' language may be, in part, responsive to the child. Cunningham, Reuler, Blackwell, and Deck (1981) in a study of maternal interaction with mentally retarded children, found that the mothers of these children produced a greater amount of directive language. They also reported that these children engaged in more solitary play than younger normally developing children at a similar level of language development, and this may have caused the adults to produce more directive language. Jones (1978) also noted that mothers of mentally retarded infants were more directive than mothers of normal infants. He speculated that this may have been due to more passive behaviors on the part of the mentally retarded infant, or a perception of such on the part of the parent. Lasky and Klopp (1982) and Newhoff and Millet (1978) also found that the child with a specific language disorder was exposed to more commands and imperatives than the normal language matched child though differences were not significant. Newhoff et. al. (1980) postulated that a lack of responsiveness on the part of the child may contribute to more directive behavior on the parents part.

#### Need for the Study

A linguistic environment fine-tuned to the child's developing language capacities supports a relatively strong role for the linguistic environment as a language learning model. Studies of the nature of adults' interaction with

children have not sufficiently substantiated what influences adults' child-directed speech. Effects of the child's age, cognitive maturity and language level are difficult to separate when studying the normally developing child.

Specific language disorder in children is characterized by difficulty in acquiring language in the presence of normal hearing sensitivity, and no evidence of neurological, emotional, or general intellectual deficits (Weiner, 1974, Benton, 1976). These children are often late in acquiring language and show subsequent slow development of these capacities (Morehead and Ingram, 1973, Weiner, 1974). This population of children provides a unique opportunity to examine the specific effect of language level in shaping adults' speech to children.

Additionally, in the interests of providing an appropriate intervention program for these children, it is necessary to determine what factors influence the parents in modifying their language and whether the resultant linguistic environment appears to be conducive to language learning. Certainly the decision as to whether and how to modify the parents behavior as part of a clinical intervention program must be based on a description of the nature of the interaction and what factors guide adults in their linguistic modifications.

Thus far there have been few studies of the linguistic environment of children with a specific language disorder. Those that have been done suffer from methodological

problems including subject selection and description, limited data analysis, and use of only an age or language matched control group.

In a study of language disordered children, the selection of the subjects and their normal counterparts is critical to the investigation. None of the studies specifically examining maternal linguistic interaction with language disordered children have provided sufficient evidence for normal nonlinguistic development in their language disordered population, and there is little description of their comprehension abilities.

Identification of normal subjects as control groups also requires assessment to insure within average functioning. Many previous studies have also not provided matching criteria for the children other than MLU; excluded are factors such as socioeconomic status, sex, and birth order which need to be controlled because of their potential effect on the interaction (Clarke-Stewart, 1973, Tulkin and Kagan, 1972, Cherry and Lewis, 1978, Nelson, 1973).

Given carefully controlled subject selection, there is much yet to be learned about the nature of the linguistic environment of language disordered children. Early studies were mostly about formal syntactic aspects of the environment. Results showed that these features are generally adjusted to the child's language level. Semantic, discourse, and functional aspects have received less attention though these have been clearly shown to be finely

adjusted to the normally developing child's capacities and are related to rate of language learning. The discourse feature that has been found to differ in the speech to children with a specific language disorder, that of semantically related responses, has been narrowly defined, and since it only accounts for a small proportion of the data, it alone does not adequately describe these mothers' linguistic performance as they interact with their children.

Control groups in previous studies have consisted of only age or language matched children. The SLD child, by definition, has nonlinguistic cognitive abilities similar to normal age-matched children, but possesses the language abilities of a younger child. Given that both of these areas of development may influence the linguistic environment, it is possible that parental input and interaction may be variously tuned to the differing capacities of the child. Therefore, there is a need to examine more completely the maternal linguistic environment, and compare it to both that of the normal age-matched, and the normal (younger) language-matched child. There is also a need to consider whether the maternal interaction is responsive to the child's particular linguistic and behavioral style as suggested by Lieven (1978b) or whether it is part of an adult strategy based on interactional intent. If, as it has been suggested by many researchers, the linguistic behaviors of mothers are responsive to the child's linguistic or other behaviors, then other adults

interacting with these children may also make similar adjustments in their linguistic styles with these children.

In response to the above-mentioned needs, this study was designed to examine mothers' language directed to children with a specific language disorder. Discourse and functional features were included in the analysis. The syntactic variable MLU was also determined. The relative frequencies of each of these features were compared with the relative frequencies of the same features in the speech of mothers directed to normally developing children of the same age and to normally developing children of the same language level.

Also, the speech of each of the mothers was compared to an adult stranger's speech to the same child. Each adult stranger interacted with one language disordered child, one age-matched, and one language-matched child. This procedure controlled for differences in style of interaction and thus enabled a more careful exploration of features of the adults' language in terms of responsiveness to the child's varying abilities. If, as it has been speculated, mothers' linguistic interaction with language disordered children is shaped by the child's unique linguistic or other behaviors, it was assumed that the adult stranger would show similar differences in her linguistic interaction with the child with a specific language disorder. On the other hand, if the adult stranger did not show a pattern similar to that of the mothers of children with specific language disorder, but

was more similar to mothers of either of the normally developing children, one might conclude that the mother is employing an interactional strategy which is likely based on other factors.

The experimental subjects in this study were fully assessed to insure that they fit the definition of language disorder. Normal control subjects were also developmentally evaluated to determine average abilities. A number of matching criteria for the experimental and control mother-child pairs were met.

#### Research Questions

1. Are there differences in the relative frequencies of various linguistic features in the maternal utterances to children with specific language disorder as compared to maternal input to a) normal children of the same age, b) normal children of the same language level?
2. Are there differences in the relative frequencies of linguistic features in the utterances of adult strangers directed to the child with specific language disorder as compared to the same adults' language to a) normal children of the same age, b) normal children of the same language level?
3. Does the mother's linguistic interaction with the child with specific language disorder differ from that of the adult stranger's linguistic interaction with the same child? If so, are these differences also found with the

a) normal child of the same age, b) normal child of the same language level?

CHAPTER TWO

METHODS

Subject Selection and Description

The subjects consisted of 12 mother-child pairs. On the basis of criteria differentiating the children, the subjects were divided into three groups, each consisting of four mother-child dyads. One group was made-up of mothers and their children who had been diagnosed as having a specific language disorder . The other two groups were comprised of mothers and their children who were judged to be developing normally. These subjects functioned as control groups. The information presented below describes the dyads constituting each group in more detail.

All the mothers selected for the study were required to meet the following criteria:

1. Middle class socioeconomic status.
2. Only English spoken in the home.
3. Completion of high school.
4. Primary caretaker of child spending an average of six or more hours with the child daily.

The mothers ranged in age from 28 to 38 years of age.

All the children selected for the study met the

following criteria:

1. Normal nonlinguistic cognitive development (see below for method of assessment and criteria for inclusion).
2. Normal hearing (measured by pure tone audiometric testing) and no history of hearing impairment.
3. No history of neurological difficulties.
4. Not first-born.

Language abilities differentiated the normally developing children from children with a specific language disorder.

Subject Description - Children with Specific Language Disorder

This group was made up of four mothers and their children who had been diagnosed as having a specific language disorder (SLD). Table 1 presents detailed data on each child. The children were identified by a clinical team consisting of a speech/language pathologist, psychologist, social worker, and special education teacher. Their chronological age range was between 4;1 and 4;5 years. MLU was between 1.48 and 2.43. They were selected from those children enrolled in a preschool program for handicapped children in the BOCES Putnam/Northern Westchester special education district in New York. The Arthur adaptation of the Leiter International Performance Scales (Arthur, 1952) and the McCarthy Scales of Children's Abilities, Perceptual-Performance Section (McCarthy, 1972)

were used to determine normal development of nonlinguistic cognitive skills.<sup>1</sup> Normal development was defined as Scaled Scores within one standard deviation of the mean. In addition to the criteria noted above, the following were met by each of the subjects in this group.

1. Performance more than 1 standard deviation below the mean on the Verbal section of the McCarthy Scales of Children's Abilities and a minimum separation of 1 standard deviation of Scaled Score points on the Perceptual Performance vs. Verbal sections of the same test.
2. Mean length of utterance (MLU) more than 1 standard deviation below the mean (Miller, 1981).
3. Performance more than 1 standard deviation below the mean on the Grammatical Comprehension subtest of the Test of Oral Language Development (Newcomer and Hamill, 1980). This was included to insure that the child's sentence comprehension was also significantly impaired; this information is not provided by the two criteria above.

None of the SLD subjects were first born; this was a coincidence and not a selection criteria. Three of the SLD subjects had an older sibling judged to be developing normally. The fourth subject (SLD-2) had 3 older siblings, one judged to be developing normally and two with reported auditory and language problems.

#### Subject Description - Normally Developing Children

All these mother-child pairs were referred by a community nursery school program or by friends. There were

<sup>1</sup> Tests for all subjects were administered by a school psychologist or a speech-language pathologist.

Table 1. Identifying data for children with specific language disorder (SLD) and their mothers (M).

SLD sub-jects	Sex	Birth order	CA	<u>Verbal Measures</u>			<u>Performance Measures</u>		M's age	M's education
				MLU	TOLD Grammatical Understanding Scaled Score (X=10 s=3)	McCarthy-Verbal Section Scaled Score (X=50 s=10)	Leiter IPS IQ	McCarthy Perc-Perf Scaled Score (X=50 s=10)		
SLD-1	M	2 of 2	4;2	1.48	6	26	114	46	34	Masters
SLD-2	F	4 of 4	4;2	2.43	6	34	104	49	34	High School
SLD-3	M	2 of 2	4;5	2.08	6	30	108	51	33	1 year college
SLD-4	M	2 of 2	4;1	1.99	4	38	98	48	34	Masters

two groups of normally developing children. One group, presented in Table 2, consisted of children (C-LM) and their mothers (M-LM) who, in addition to meeting the criteria stated above for all mother and child subjects, included children matched according to MLU ( $\pm .4$ )<sup>1</sup>, sex, and birth order (not first born) to the SLD children.<sup>2</sup> Because of the matching criteria language level, these children were chronologically younger than the SLD children; they ranged in age from 2;1 to 2;4. The Bayley Scales of Infant Development was administered to these children to confirm the judgement of normal development. A Mental Developmental Index (MDI) 1 standard deviation of the mean for the child's age was considered normal.

Table 2. Identifying data for LM children and their mothers (M).

LM sub- jects	Sex	Birth order	CA	MLU	Bayley Scales MDI	M's age	M's educ.
LM-1	M	2 of 2	2;4	1.65	106	34	Masters
LM-2	F	2 of 2	2;1	2.05	114	34	2 years college
LM-3	M	2 of 2	2;3	2.04	91	28	B.A.
LM-4	M	3 of 4	2;4	1.75	109	38	Masters

<sup>1</sup>  $\pm .4$  is well within the predicted standard deviation of MLU for children ages 24 to 60 months (Miller, 1981).

<sup>2</sup> All of the normally developing children were chosen individually on the described bases to match a child with a specific language disorder. However, the age and abilities of each child were similar and thus constituted a group for the purposes of group comparisons.

The other normally developing children (C-AM) and their mothers (M-AM) are presented in Table 3. In addition to meeting the above criteria for all subjects, this group was comprised of children matched by chronological age ( $\pm 5$  months)<sup>1</sup>, sex and birth order (not first born) to Group 1 children. They ranged in age from 4;0 to 4;7 years. The McCarthy Scales of Children's Abilities were given to insure functioning within normal limit expectations for their age. A General Cognitive Index (GCI) within one standard deviation of the mean for the child's age was considered normal. These children's Scaled Scores on the Verbal subtest were at least two standard deviations above that of the SLD children.

Table 3. Identifying data for age-matched (AM) children and mothers (M).

AM sub- jects	Sex	Birth order	CA	MLU	McCarthy Scales Verbl Perc Quan (X=50 s-10)			GCI	M's age	M's educ
1-AM	M	2 of 4	4;7	5.02	49	49	47	98	38	M.A.
2-AM	F	2 of 2	4;0	3.97	58	53	54	111	34	B.S.
3-AM	M	3 of 4	4;3	3.98	58	52	64	113	30	3 yrs coll.
4-AM	M	3 of 3	4;2	4.21	58	58	58	114	36	3 yrs coll.

Subject Description - Adult Strangers

Four adult strangers were chosen to interact with the

<sup>1</sup>  $\pm 5$  months is within the standard deviation of predicted age for children at this stage of language development (Miller et. al. 1981).

children: one with each of the language disordered children and with the two matched normally developing children. Their age and educational level, indicated in Table 4, were similar to the SLD mothers. These adults had children of their own but did not, at the time of the taping, have children within the two to five year age range. This requirement insured that these adults had experience talking to children but did not have a current "set" strategy for interacting with the children of the same age as in this study. They also met the criteria outlined for all of the mothers detailed at the beginning of this section.

Table 4. Identifying data for adult strangers.

Adult subjects	Age	Education
1	35	Masters
2	40	B.S.
3	40	1 year college
4	37	Masters

#### Screening Procedures

Each mother-child pair was initially visited in their homes by the investigator in order to familiarize all parties with one another and to complete assessment procedures necessary to determine the dyad's appropriateness to the study. A permission/release form (see Appendix A) was given to each parent to read and sign. The mothers were then interviewed, and the normally developing children were

administered all test instruments described above. Testing was done by a school psychologist. The SLD children were administered the Test of Language Development by a speech-language pathologist (all other testing had been completed as part of the school program).

#### Data Collection Procedures

The mother-child dyads were video and audiotaped interacting in a 40 minute free play session. The first 10 minutes were considered a warm-up period for the interaction. The session took place in an experimental playroom setting, an enclosed room approximately 20 X 20 feet in size. During this free play period, a set of preschool toys were available. These toys were divided into four groups; one group was present on the floor of the playroom setting at the beginning of the interaction and a new group was added every 10 minutes by the investigator (see Appendix B). Verbal instructions given to each mother before the recording session were to play with her child as if she had some free time to spend with him/her at home. The same procedure was followed with the adult stranger who was recorded interacting with the child within two weeks following the taping of the mother-child interaction. This order of taping was utilized because it was felt that these preschool children, especially the younger normally developing group, were more at ease, and thus more likely to interact if they had previously experienced the session with

their mothers.

The tapes were transcribed by the investigator in the manner described in Conventions for Transcription of Child Language Recordings in Bloom and Lahey (1978). Data from the tapes were categorized as described below.

#### Reliability Measures

Two types of reliability measures were calculated for these data, one for the transcription and one for the categorization of the data. Transcription reliability was determined by comparing 15 percent (720) of the maternal and adult utterances transcribed by the investigator with those transcribed by an undergraduate student majoring in speech-language pathology. The first 100 utterances for six subjects and 120 utterances (to achieve a total of 720 utterances) for one subject following the ten minute warm-up period were used. These samples were randomly selected (chosen blindly from each set of tapes) by the student from each group; a mother and stranger from each of the three groups, plus one extra mother from the SLD group were utilized for the transcription reliability. All child utterances intervening were also transcribed. For the purposes of this reliability measure, the utterances were judged to be the same if exact replicas of one another or if the differences did not change the way in which the adult utterance would be coded. Agreement was 97 percent.

Categorization reliability was determined by comparing

15 percent (720) of the utterances coded by the investigator with those done by a graduate student majoring in speech-language pathology who was trained in the coding procedures. The coding was done from the investigator's transcripts without accompanying video or audio tapes. The first 100 consecutive utterances for six subjects and 120 utterances for one subject following the ten minute warm-up period were used. The extra 20 utterances from the seventh subject were necessary to achieve the total of 720 or 15 percent of the utterances used for the reliability measure.

The subjects' transcripts from which the utterances were categorized for the coding reliability measure were selected randomly by the student from each group. One mother and one stranger from each of the three groups in addition to one extra mother from the SLD group were used. Reliability averaged for all subjects was 89 percent (82, 92, 95, 83, 95, 86, 90 percent for each subject individually) for the response type (discourse) categories, 84 percent (84, 90, 85, 83, 76, 78, 92 percent for each subject individually) for the functional categories, and 96 percent (95, 98, 96, 96, 99, 94, 95 percent for each subject individually) for other conversational categories.

#### Analysis of the Data

Maternal and adult utterances constituted the primary data used for the purposes of this study. The first 200 utterances after a 10 minute warm-up period were analyzed.

The utterances were multiply categorized; each was coded according to its response type, function, whether it was a self repetition, whether it initiated or continued a conversational turn, and whether it related to the child's attentional focus. Non responses to the child's utterances for the time period of these 200 utterances were also counted.

The categories were selected if they had been identified in the literature as facilitating or inhibiting a child's language development, as "teaching" devices, or if they showed significant changes in proportional frequency of use as the child develops. A few of the categories were derived by the investigator to account for the data observed.

With the exception of MLU, the data were examined in terms of the frequency with which each category type was used (since 200 utterances from each sample were analyzed, the absolute frequency of each category was proportional). These frequencies were then used to make the following individual and group comparisons:

1. Mothers with their language disordered child vs. a) mothers with their normally developing child matched for age, and b) mothers of their normally developing child matched for language level.
2. Adult strangers with the language disordered children vs. adult strangers with each group of normally developing children
3. Mothers with their SLD children vs. the adult stranger with the SLD children.

The chi square statistic was used to assess significant differences in the distribution of response types and functional features for each of the groups comparisons. The

mean frequency of use of each category was used in calculating these statistics. For other single categories differences between groups were assessed for significance with Mann-Whitney U tests.

## Categories

### Pragmatic categories

These categories capture the discourse style and functional aspects of the mother and adult speech when talking to children. These aspects been found to change as the child develops and they also have been associated with the child's rate of language learning. Categories selected from the previous literature on adult-child interaction are referenced. Categories numbered 2, 5, and 6 under discourse features-response type (A) and category 3 under other conversational features (C) were added by the experimenter to account for some of the data not captured by the other categories. The examples given for each category were taken from the data in this study.

#### A. Discourse features - Response type

The following are defined according to how they relate to the topic of the child's utterance. With the exception of category number 6, 'within-turn extensions' all of these categories refer to adult utterances which begin the conversational turn, i.e., utterances which immediately follow a child utterance, action, or non-response (a pause of 2 or more seconds).

1. Semantic extensions (Cazden, 1972, Cross, 1977, 1978, Newhoff et. al, 1980). These utterances refer to the same contextual elements as the child's immediately preceding<sup>1</sup> utterance but they also encode additional aspects of those elements or different semantic/syntactic relations. Additionally, these utterances incorporate a lexical contentive exactly or anaphorically from the child's preceding utterance as follows: noun phrase extensions incorporate the child's topic noun phrase, e.g., C: "Horse run."

<sup>1</sup> 'preceding' is defined as an utterance that appears in the immediately previous conversational turn. A turn is defined by Keenan (1974, p 164) to be one or more utterances bounded by a long pause or the utterance of another speaker.

M: "The horse is getting away"; pronoun extensions use the child's explicit or implicit topic by pronominalization, e.g., C: "Horse run", M: "He is getting away"; predicate extensions incorporate any lexical item not included in the child's topic noun phrase, e.g., C: "Horse run", M: "The dog is running too". The following are examples taken from the data in this study showing the variety of forms and functions these utterances can take:

a. Nonelicited comments or related directives

C: Car broke/

A: Put it in the repair shop/ (pronoun extension)

C: Or it goes by the fences/ Goes by the fences/

A: It could, it doesn't have to stay in the barn all day/ (noun phrase extension)

b. Elicited comments

C: Put it in here?/

A: Maybe its to hold all the animals/ (predicate extension)

C: Where?/

A: I think it goes inside/ (predicate extension)

c. Nonelicited questions

C: I'll call the police/

A: Who's your favorite person to talk to on the phone?/ (predicate extension)

C: (C playing with airplane) I know, this is packs/

and the people have to go in here

A: Have you ever been on an airplane?/ (predicate extension)

2. Grammatical expansions and repetitions.

b. Expansion (Cazden, 1965, Cross, 1977, 1978).

This category includes maternal responses that maintain the content of the child's utterance but expand or elaborate it through the use of additional linguistic elements. The response may be complete e.g., C: Mommy sleep/, A: Mommy is sleeping/, incomplete, e.g., C: Talk phone/, A: Talk on phone/, elaborated, e.g., C: Horse big/, A: The horse is big and fat/, or transformed, e.g., C: It hot/, A: Is it hot?/

c. Repetitions (Cross, 1977, 1978).

These include maternal utterances which are an exact or partial repetition of a child's preceding utterance. Intonation may differ. The following are examples:

C: It a spoon/

A: A spoon/

C: Turn around/

A: Turn around?/

3. Response to child action.

This category includes utterances which are primarily responsive to the child's action, to what s/he is looking at, pointing to, or doing. These utterances encode something a child does or focusses on in the context. In general, they are not immediately preceded by a child's utterance, unless that child's utterance does not refer specifically to the activity or is a response to a preceding adult turn. The following are examples:

A: Oh, you did?/

C: Yeah/ (C. hands Mom a cup)

A: Is that for me?/

C: (C. pouring tea into a cup)

A: Careful it might be hot/

C: (C picks up plate from floor)

A: uh, you forgot the plate/

C: (C. takes barrels toy apart)

A: It looks just like tops/

C: (C. puts all the barrels away quickly)

A: Boy, that was fast/

C: (C. holding train) Broke/

A: Oh, the train?/

C: (C playing with people inside airplane, many of which are lying on their sides) This time/

A: Are they sleeping?/

4. Ready made/ routine-like expressions (Lieven, 1978).

These are utterances which do not fall into any grammatical class and are unanalyzable routine-like expressions. They include such utterances as Oh/, Yeah/, M Hm/, Oh good/, Here you go/, There/(The latter two are an expressive accompaniment to action rather than an indication of the semantic relation locative action).

NOTE: The classification of repetition overrides that of ready made, i.e., if a child says "Yeah" and this is followed by the adult "Yeah" this receives a repetition classification.

5. Adult controlled utterances.

These are utterances which are related to what the

adult is doing, or to the topic of the previous adult turn. If related to the topic of the previous adult turn, the child's utterance immediately preceding this type of utterance is not extendable or expandable; it may be routine-like (e.g., yes, no, okay), a different topic, or it may be a repetition of the previous adult turn. These utterances may also follow a child's non-response (a pause of 2 seconds or more). In general, these are utterances in which the adult appears to be exerting topic control in a conversational turn or from one conversational turn to the next even though the child may have originally initiated the topic. For example, the following utterances designated by an asterisk fit this category:

C: (C has taken telephone out of toy box - C pushes buttons)  
A: Who are you calling?/  
C: (No response)  
A: Who are you calling?/\*  
C: I a know/  
A: Who do you want to talk to on the phone?/\*  
C: (No response)  
A: Who?/\*  
C: I a know/  
A: Do you want to talk to the operator?/\*  
C: (No response)  
A: Do you know her?/\*  
C (No response)  
A: Why don't you call Tara?/\* See if Tara's home/  
C: Allright/

6. Within-turn extensions.

These are utterances which maintain the topic but encode additional elements of a previous utterance within the adult turn. For example:

A: Toy store/ Are you gonna buy something at the toy store?/\*

A: I think you have to turn it around the other way/ You have to hook it on there/\*

A: The cows go in the barn/ They might get cold outside/\*

7. New topic utterances (Cross, 1977, 1978).

This includes maternal utterances which refer to different elements of the environment than the child's or adult's utterance or focus of interest.

8. Uncoded.

The majority of utterances in this category were

utterances which did not initiate the adult's conversational turn, and were not classified as "within-turn extensions", category number 6, defined above.

B. Communicative Functions

1. Directives (Nelson, 1973)

This includes all directions, instructions, commands and requests to the child and may be direct or indirect as follows:

a. Direct directives.

These are direct commands or requests and typically occur in imperative form.

b. Indirect directives

These indirectly direct the child's behaviors and occur typically in question or comment forms, e.g., Can you slide down the slide?/ The baby looks like she might be cold (A is holding up the baby blanket)/ We should look in the barn/

2. Assertives (Dore et. al., 1978).

This category includes all utterances which identify (e.g., That's a cow/), describe (e.g., It's in the barn/), convey self or others' internal states (e.g., I like it/ He wants to/), state rules (e.g., We'll get those toys later/) and explain (e.g., The animals drink water from the trough/).

3. Questions to request information or offer floor.

(Shatz, 1979). This includes utterances which elicit information the adult does not have, but wants, e.g., Do you like the beads?/ What do you see? (When the adult does not know what the child is looking at)/ Did you ever ride on an airplane?/ Where did you go?/ and it includes questions with no answer in mind, giving the child the chance to direct the conversation, e.g., Where is the plane going?/ What's it's name?/

4. Questions to test the child's knowledge (Shatz, 1979). This includes questions which elicit specific information the mother has and expects the child to know, e.g., What color is that?/ How many are there?/ (A holding up a toy cow) What is this?/

5. Reflective questions (McDonald and Pien, 1981, Olsen-Fulero, 1984). These questions repeat reduce or paraphrase the child's previous utterance, or describe or acknowledge the child's activity. They often take the form of yes/no questions.

6. Acknowledgements (Dore, et. al., 1978).

These utterances simply acknowledge a child's utterance or activity and are non-requestive. They

include utterances such as Oh/ Okay/ Yeah/ M Hm/ Allright/.

7. Rejections (Nelson, 1973) . Rejections include all utterances by the mother that indicate that she disapproves or rejects the child's verbal or non-verbal behavior, e.g., Stop that/ Don't do that/ (C holding lifesavers)C: Eat Mommy/ A: No, not now, after lunch/ (C takes lifesavers out of pocket) A: Put that away in your pocket/.
8. Uncoded. The majority of utterances which were not coded in this analysis were questions to request clarification and to challenge the child's utterance or activity, regulatives, (e.g., attention getters such "hey" or child's name, boundary markers such as "okay", politeness markers such as "please"), exclamations, praise, and expressive repetitions (Dore et. al., 1978).

C. Other conversational features

1. Adult self repetitions (Cross, 1977).  
This includes utterances which repeat exactly, partially, or in paraphrased form an adult utterance within the previous 5 adult utterances.
2. Continuing utterances  
These are utterances which do not initiate a conversational turn. This category is designed to reflect the number of maternal utterances per turn (Cross, 1977, 1978).
3. Utterances unrelated to child's focus.  
These included utterances which were not related to the toy the child was playing with, the child's play theme, or the child's utterance. These differ from New Topic utterances in that, if the topic was introduced within the previous 5 adult utrn, it would not be considered a New Topic, however, it may be unrelated to the child's focus.
4. Nonresponse (Levinson, 1979).  
This was coded when the parent did not respond verbally or nonverbally to a child's utterance turn.

Syntactic Measure

In addition to the pragmatic categories indicated above, mean length of utterance was calculated as recommended by Brown (1973) for the first 100 maternal and adult utterances analyzed.

## CHAPTER THREE

### RESULTS

This study examined maternal and adult utterances during free play interaction with preschool children who have specific language disorder (SLD) and two groups of normally developing children. One of the normally developing groups was matched in age to the SLD children (AM) and one group was matched by MLU, a measure of language level (LM). There were four children and their mothers in each group. Additionally, four adult strangers were included in the study. Each of these adults interacted with three different children, one from each of the SLD, AM, and LM groups.

Discourse and functional aspects of the mothers' and adults' speech were examined. MLU was calculated for each subject. The categories selected for use in analysis were those which have been associated with language facilitation in children and those which have showed change in relative frequency of occurrence with the age and language level of the child. Others were added as needed to account for other utterances in the data collected.

This chapter presents a summary of the major findings followed by details of the results according to the research questions asked. The response types, functions, and other conversational features for the mothers of each group of

children are presented first. These data are followed by the results for the strangers interactions with the same children. Finally a comparison of mothers and strangers with the SLD children is made and individual differences in specific categories are considered.

#### Major Findings

The results of this study provide convincing evidence for the role of the child's language level (as indicated by MLU) in influencing the discourse and functional aspects of mother-child speech. Mothers of SLD children were strikingly similar to mothers of younger LM children in their response types, functions and use of self repetitions. Differences in all of these aspects of the mothers language were found when comparing each of these two groups to the AM mother-child dyads. Results of the stranger-child interaction provided confirmation of the role of this measure of linguistic level in affecting modifications in adult speech. These adults had no previous contact with the children, suggesting that the child's language capacities were immediately influential in evoking certain linguistic interaction patterns from adults.

The second major finding of this study is that, unlike the findings of previous research, mothers of SLD children did not provide significantly fewer topic related responses or more directives to their children than the mothers of LM non-impaired children. There were differences, however, in

both of these aspects of the mothers' and adults' speech to the SLD and LM children when compared to the AM group. That is, the SLD and LM children heard relatively more repetitions and expansions of their utterances whereas the AM children heard more semantic extensions. The AM children were also exposed to fewer directives than the SLD and LM children. This finding appears to reflect the influence of language level on these aspects of child-directed speech.

The third major finding of this study is that the SLD mothers used the parameters 'nonresponse' and 'utterances not related to the child's focus' more frequently than either of the other groups of mothers. These results were not found when the adult stranger interacted with the SLD child, and therefore cannot be explained as responses to child cues as were the above-noted features. Rather, these findings appear to reflect a current maternal strategy for interacting with her SLD child.

The fourth major finding is that there were extreme individual differences in the SLD mothers use of the two parameters, 'nonresponse' and 'utterances not related to the child's focus', suggesting that conclusions about group differences may be misleading. These individual differences may be, in part, the reason for discrepancies found in previous literature examining the maternal linguistic environment of language disordered children.

### Data Related to Maternal Linguistic Interaction

One question investigated in this study was whether the child's age and cognitive level, the level of linguistic development, or maternal stylistic variations led to the modifications mothers made with their language disordered child. Furthermore, it was of concern whether these mothers provide a linguistic environment which might be less conducive to language learning than that provided by mothers of the normally developing child.

The details of the mothers' language including discourse and functional aspects with each of the three groups of children (SLD, LM, AM) are provided below. Statistical tests of significance between groups are included.

#### Maternal Responses

For each mother, 200 utterances were analyzed according to their discourse relationship with the child's previous utterance or activity. The frequencies and relative proportions of these response types in the mothers' language with the SLD, LM, and AM children are presented in Figure 1. These data along with data for individual subjects are presented in Table 5 in Appendix C. The chi-square statistic was used to test for significant differences in patterns of response types between the following groups: SLD and LM; SLD and AM, and LM and AM.

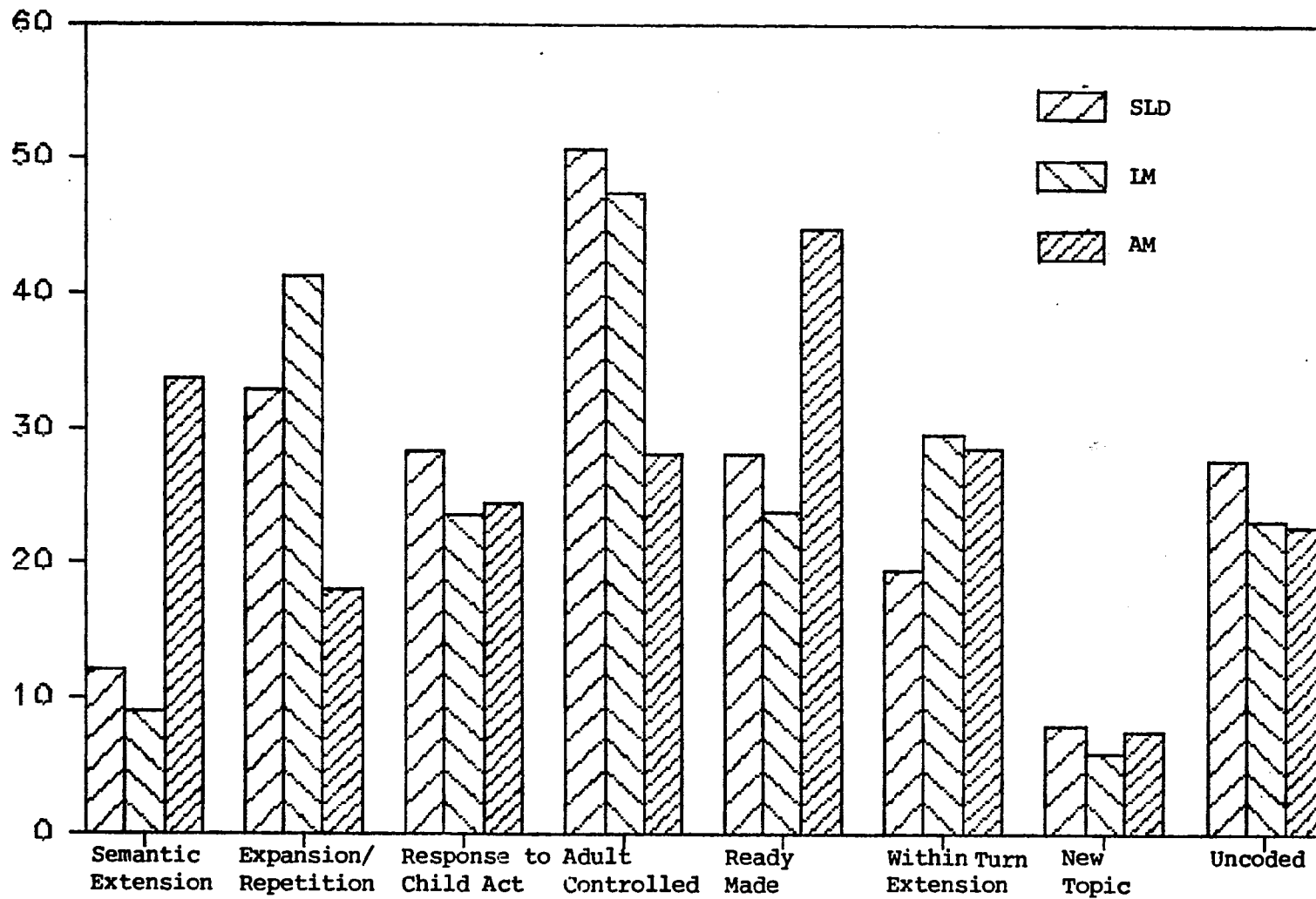


Figure 1. Average frequency of utterances (out of 200) in each response type category used by mothers with specific language disordered (SLD), language-matched (IM), and age-matched (AM) children.

### SLD and LM mothers

The patterns of mothers' responses to the SLD and LM children were strikingly similar. Chi-square for comparison of the distribution of responses between the two groups (df=7) was 2.12 which is not significant ( $p > .05$ ).

As demonstrated by the data in Figure 1, mothers of both of these groups of children were more likely to repeat or grammatically extend their child's utterance rather than to add new semantic information to it. Also, the mothers in each group were similarly likely to encode their child's actions, and to use utterances that controlled the conversation (adult controlled utterances). Both groups of mothers used a lower frequency of routine-like ready-made responses with the SLD and LM children than mothers of the AM group. New topic responses were rare in all groups.

These data suggest that mothers of SLD children responded to their child's utterance in much the same way as the mothers of the normally developing, albeit younger, children.

The category of within-turn extensions is the only aspect that appeared to differentiate between the groups. There were more within-turn extensions provided to the LM children. Thus, though both SLD and LM children did not frequently hear added semantic information in their mothers immediate response ('semantic extensions'), only the LM mothers were more likely to add semantic information in a subsequent utterance within the conversational turn.

#### SLD and AM mothers

Chi square for comparison of pattern of response types for the SLD and AM groups was 17.89 which is significant at the .02 level of confidence. Inspection of Figure 1 suggests that four categories of response types were primarily responsible for the differences between the two groups. Mothers of AM children were more likely to add semantic information to their child's utterances in their immediate response (semantic extensions) as well as within their conversational turn (within-turn semantic extensions) than SLD mothers. They also assumed less control of the conversation, providing fewer adult controlled utterances and more ready made routine like utterances.

It therefore appears that language differences between these two groups of children affected the type of linguistic response from their mothers.

#### LM and AM mothers

As expected, a significant difference in the pattern of responses heard by the two groups of normally developing children was obtained. Chi-square for differences in the distribution of response types with each of these groups of children was 19.96 which is significant at .01. With the exception of the category within-turn extension, which was similar for both of these groups of non-impaired children, the differences in mothers' response types were similar to that of the SLD and AM groups as described above.

All mothers

The mothers of the SLD children produced a smaller proportional frequency of semantically related responses to their children's utterances when compared to both the LM and AM groups. These differences, however, were not significant. This category of semantically related responses represents the sum of semantic extensions, grammatical expansions, and repetitions. The mean frequency was 44.75 for the SLD group, 50.25 for the LM group and 53.5 for the AM group. However, if the definition of topic related response is expanded from that used in previous literature (Cross, 1977, 1978, Newhoff et. al., 1980) and individual differences are considered the differences are reduced.

First, a breakdown of another topic related category, responses to child action, revealed a subcategory of responses to child utterances which were topic related but did not incorporate any of the lexical items from the child's utterance as was required for inclusion in the above categories. These responses to child action are extensions of the child's utterance which relate to the child's action and utterance as follows:

(C manipulating a people figure going from the truck to the floor)

C: Jump/

A: Yeah, he's getting down/

(C placing doll figure in chair)

C: Doll sit/

A: In the chair/

When added to the topic related category the mean

frequencies for each group are more similar: 51.75 for the SLD mothers, 54 for the LM mothers and 59.5 for the AM mothers.

Secondly, an examination of the individual SLD mothers indicated that one of the mothers, LM-4 (see Table 5 in Appendix C), contributed most to the lower frequency of semantically related responses for the SLD group. Even without the context extensions described above, the mean for the other three mothers is 55 which is slightly higher than the mean found for the other two groups. No general conclusions about SLD mothers as a group can therefore be made. This extreme difference was not found among the LM or AM mothers.

#### Functions of Maternal Speech

Each of the 200 maternal utterances used for analysis of response type was also analyzed according to its function in the conversation. The distribution of functions used by the mothers was more similar for the SLD and LM groups which again suggests the influence of the child's linguistic abilities on input from adults. Figure 2 illustrates the frequency of use of functional categories by each of the three groups of mothers. Individual data for each of the mothers is shown in Table 6 in Appendix C. The chi-square statistic was used to test for the differences in patterns of functions between SLD and LM mothers, SLD and AM mothers, and LM and AM mothers.

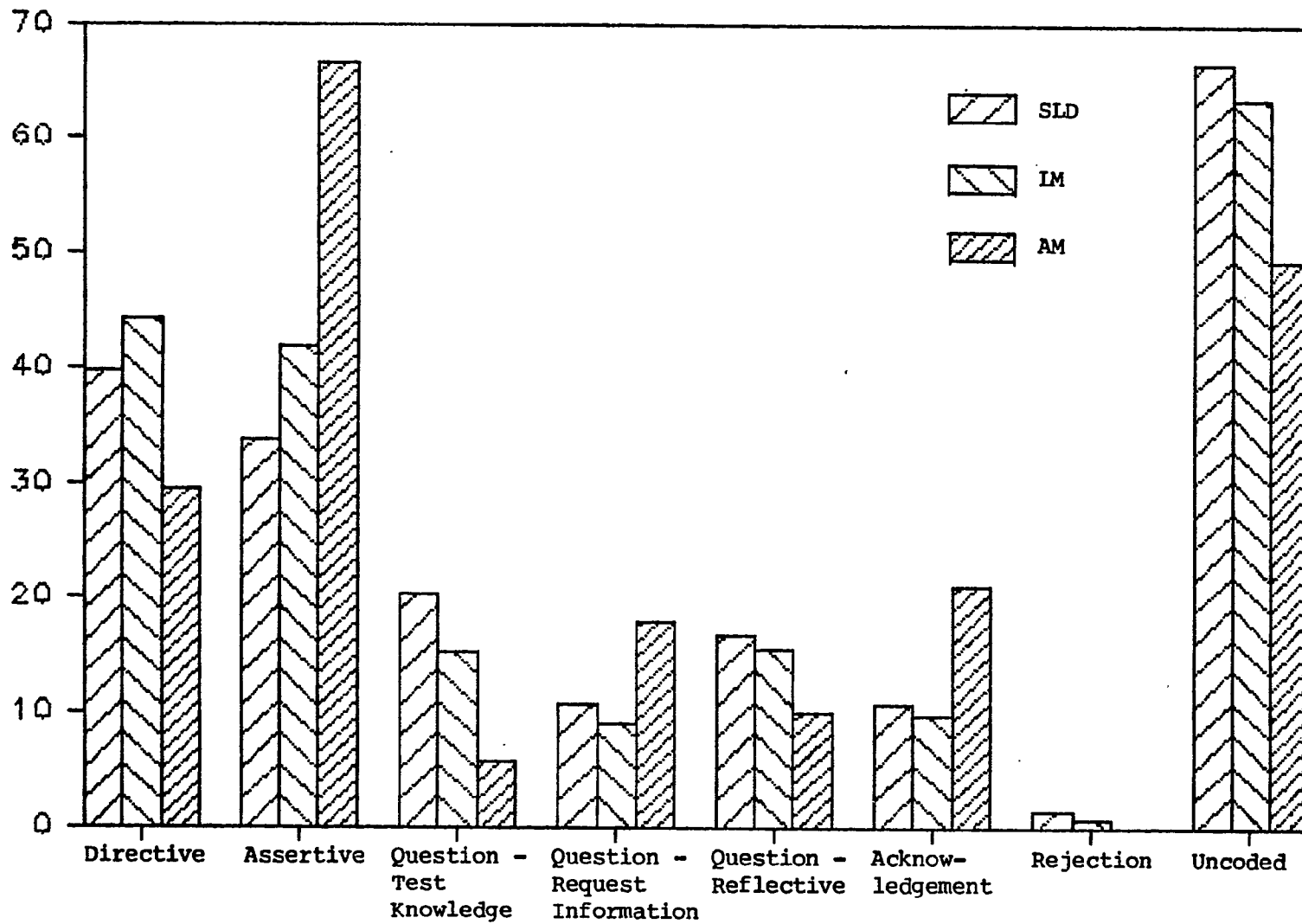


Figure 2. Average frequency of utterances (out of 200) in each functional category used by mothers with specific language disordered (SLD), language-matched (IM), and age-matched (AM) children.

### SLD and LM mothers

As found with maternal responses, the distribution of functions used by the mothers in the SLD and LM groups was similar. The chi-square statistic is 1.19 which, with 7 degrees of freedom, is not significant ( $p > .05$ ).

In general, as shown in Figure 3, mothers of SLD and LM children used slightly more directives than assertives in their speech to their children. Questions for the purpose of testing their children's knowledge, and reflective questions occurred more often than questions to gain information from the child. They acknowledged their child's utterance or activity infrequently and rejections of the child were rare.

Unlike previous studies, these data do not show that mothers of SLD children are more directive than mothers of normally developing children with similar language abilities. In fact, mothers of LM children produced slightly more directives with their children than the SLD mothers. Though the SLD mothers used more rejections than the LM group, the numbers are extremely small and thus do not suggest a stylistic difference between the groups of mothers.

The uncoded utterances for the SLD and LM children primarily included expressive repetitions and expansions of the child's utterances (Dore, Gearhart, and Newman, 1978). In this study, these utterances were coded as the discourse category 'repetitions and expansions' (see previous

section). They were not included as a functional feature for this analysis. These utterances which repeated or grammatically expanded the child's utterance occurred more frequently for the SLD and LM groups than the AM groups (see Figure 1) and they largely accounted for the high frequency of uncoded utterances in the functional analysis of maternal utterances (Figure 2).

#### SLD and AM

The distribution of functions of utterances of mothers in the SLD group varied considerably from those of the AM group. The chi-square for these groups was 14.81 which is significant at .05.

As the data show in Figure 2, most of the categories differentiated the two groups of mothers. The SLD mothers were more directive, produced more test questions and were more likely to reject their child's behavior than the mothers of AM children. SLD mothers were less likely to produce assertive comments, acknowledge their child's utterances or behaviors, and used fewer questions to elicit information from their children than were mothers of AM children.

The uncoded utterances for the AM group include expressive repetitions and expansions, praise, exclamations and regulatives (Dore et. al., 1978).

#### LM and AM mothers

The chi-square statistic for differences between the

pattern of utterances functions used by the AM and LM mothers was 11.1 which is not significant ( $p > .05$ ). However, as shown in Figure 2, the LM mothers' utterance functions differed from those of the mothers of AM children in much the same way as did the SLD mothers' group. Therefore, the same trends were evident as noted for the SLD and AM groups.

#### Other Conversational Features

Figure 3 shows the mean frequencies of the following categories: maternal self repetitions, utterances which continue a conversational turn, utterances which are not related to the child's focus, and nonresponses. Each of these individual categories was subjected to the Mann Whitney U test to determine the significance of differences between groups. These data for individual subjects are presented in Table 7 in Appendix C.

These data illustrate that mothers of SLD children produced a similar proportion of self repetitions as did the mothers of LM children ( $p > .05$ ), whereas there was a significant difference between the SLD and the AM group ( $p = .014$ ). This is another aspect of maternal language which appears to be most closely associated with the child's MLU and may reflect a sensitivity to the SLD and LM child's language processing abilities.

The use of utterances which do not initiate but rather continue a conversational turn reflects the amount of speech

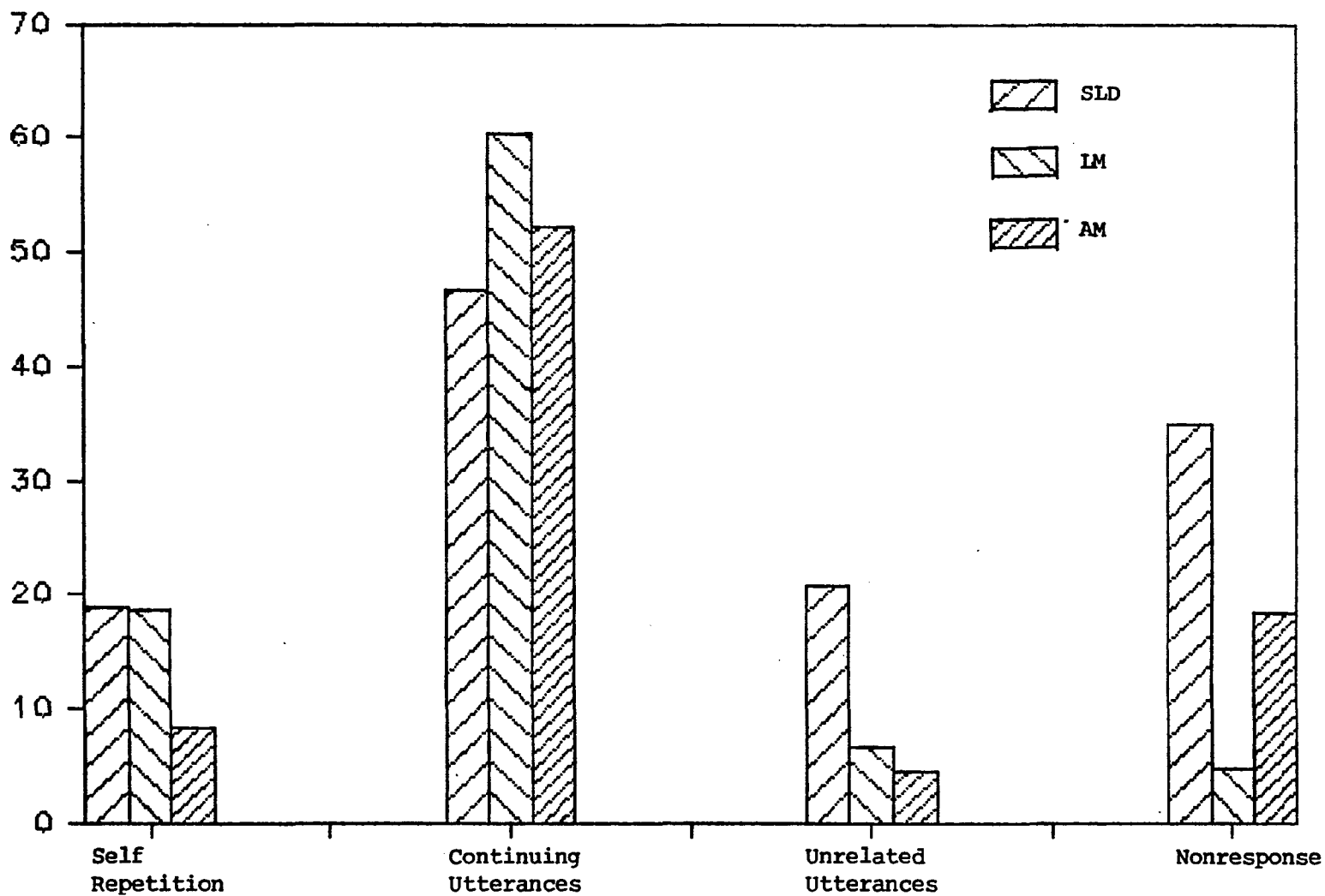


Figure 3. Average frequency of occurrence (out of 200 utterances) of 'other conversational categories' used by mothers with specific language disordered (SLD), language-matched (IM), and age-matched (AM) children.

produced by the mother each time she took a turn. This category did not significantly differentiate between any of the three groups ( $p > .05$ ). However, as illustrated in Figure 3, there was a tendency for the SLD mothers to produce fewer utterances in each conversational turn.

Use of utterances unrelated to the child's focus of attention did not significantly differ among any of the three groups ( $p > .05$ ). However, an examination of the data in Figure 3 indicates that such utterances occurred more frequently with SLD children than with either of the other two groups. When utterances unrelated to the child's focus of attention were crosstabulated with response types and functions, it was found that a large proportion of these unrelated utterances were adult controlled and new topic response types, and they functioned primarily as directives and test questions for all groups of children. In addition, two of the four SLD mothers (SLD-1 and SLD-4) accounted for the higher frequency (see Table 7 in Appendix C). A post hoc analysis of the data revealed that both of these children occupied a large portion of their time playing with only one or two of the many toys available. It appeared that these utterances were thus produced as an attempt by the mothers to change the context of the interaction. The importance of the child in creating a context for the interaction has been discussed by Constable and Lahey (1984).

Maternal nonresponses occurred significantly more

frequently with SLD children than with the LM group ( $p < .05$ ). Nonresponse to the SLD child's utterances therefore appears to be one aspect of the mothers' language which is not associated with the child's language level.

Nonresponses also occurred more frequently with SLD than AM children though this difference between SLD and AM mothers was not significant. Additionally, the Spearman Rank correlation coefficient of the frequency of 'non responses' and 'adult controlled' utterances approached a significant negative relationship ( $p = .051$ ) for the SLD mothers only.

#### Maternal MLU

MLU for each of the mothers in the three groups is shown in Table 8.

Table 8. Individual and mean MLU for mothers in each of the three groups of children.

Group	SLD	LM	AM
Subjects			
Mother 1	5.25	4.67	5.14
Mother 2	4.61	4.39	4.24
Mother 3	4.70	5.84	5.34
Mother 4	4.55	3.97	6.09
Mean	4.78	4.72	5.20

The Mann Whitney U test revealed no significant differences between the groups on this parameter ( $p > .05$ ). This confirms results of many studies that this measure of syntax is not related to differences in the child's MLU.

#### Data Related to Adult Stranger Linguistic Interaction

The influence of child variables such as age, cognitive

maturity, and language level is best examined using the same adult across children. This procedure eliminates possible adult stylistic variations (Olsen-Fulero, 1984) which cloud the data when comparing across different mother-child dyads. Therefore, in this study an adult stranger was observed during free play interaction with a child from each of the three groups of children (SLD, LM, and AM). Since there were four children in each group, four adults served as subjects. The procedures and data analysis were the same as that used for the mother-child interactions.

All the adult strangers were able to maintain interaction with the children. The strangers and children attended to their partners utterances or activities for the 40 minute play period. Though the total number of each child's utterances during the period analyzed was lower with the stranger than with the mother (see Table 9), the MLU of the children with the stranger was often higher than with the mother (see Table 10). Two LM children, LM-3 and LM-4, were much less likely to take a verbal turn with the stranger than with the mother. However, they remained a part of the interactive play session and often responded nonverbally to the adult. The differences in the strangers' linguistic interaction with these two children will be taken into consideration when reporting the results.

Details of the adult strangers' linguistic interactions including statistical tests of significance for differences with each of the three groups of children is presented

below.

Table 9. The number of child utterances in the specific language disordered (SLD), language matched (LM), and age matched (AM) groups to mothers (M) and strangers (S) occurring with the 200 consecutive adult utterances analyzed.

Group Subjects	SLD	LM	AM
	M / S	M / S	M / S
1	269/182	152/ 98	227/188
2	136/104	88/ 61	154/ 79
3	142/215	121/ 31	115/142
4	85/ 69	123/ 43	158/110

Table 10. The child MLU to mothers (M) and strangers (S)

Group Subjects	SLD	LM	AM
	M / S	M / S	M / S
1	1.48/1.48	1.65/2.06	5.02/5.56
2	2.43/2.86	2.05/2.05	3.67/3.59
3	2.08/2.54	2.04/2.14	3.98/4.27
4	1.99/1.89	1.75/1.50	5.21/5.34

#### Adult Stranger Responses

Two hundred consecutive utterances from each of the adult-child interactions were analyzed according to their discourse relationship with the child's preceding utterance or activity. The relative frequencies of these response types are illustrated in Figure 4. Data for individual subjects are presented in Table 5 in Appendix C.

#### SLD and LM groups

The strangers' responses to the SLD and LM children provide additional evidence for the influence of language

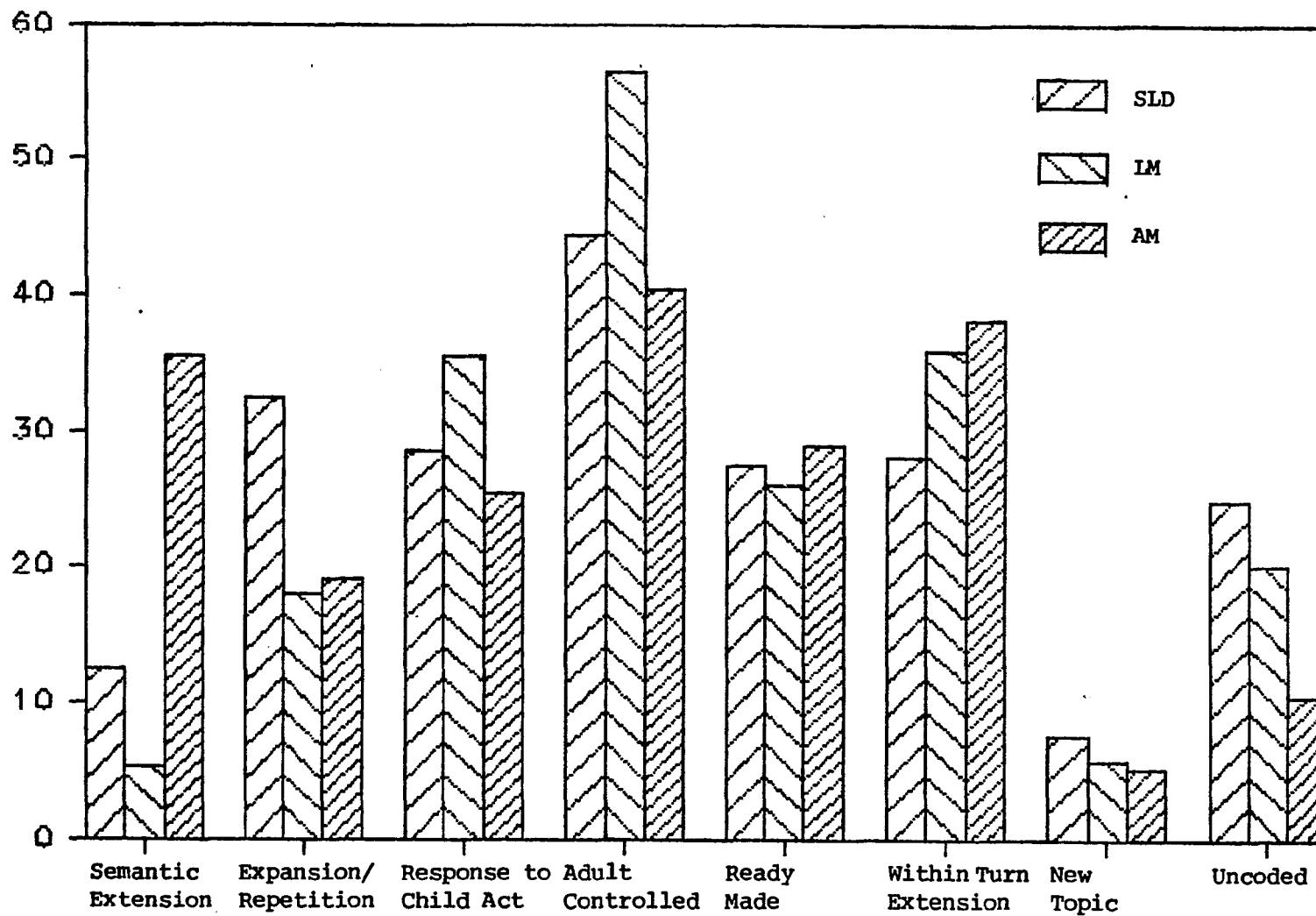


Figure 4. Average frequency of utterances (out of 200) in each response type category used by strangers with specific language disordered (SLD), language-matched (IM), and age-matched (AM) children.

level in shaping certain types of responses from adult conversational partners. The chi square of 6.03 ( $p > .05$ ) indicated no significant differences in distribution of response types between these two groups. However, the data are not as clear-cut as those of the mothers with these children. In part, this result appears to follow from the relative paucity of utterances produced by the four LM children, particularly LM-3 and LM-4, during interaction with the adult stranger (see Table 5 in Appendix C). These two children produced only a total of 31 and 43 utterances respectively with the stranger in contrast to 121 and 123 utterances respectively with their mothers. The result was the strangers' relatively greater use of responses to child action (for this category, the child did not need to produce a preceding utterance) and adult controlled conversational turns, and the relatively lower proportion of repetitions, expansions and extensions (these, by definition, are preceded by a child utterance). There are relatively fewer 'within turn extensions' provided by the stranger to the SLD child than the LM child. As mentioned previously, the relatively fewer instances of this category was also found with the mothers of these two groups of children and, therefore, may be cued by the child..

#### SLD and AM groups

Unlike the mothers, the strangers' response types to the SLD and AM children's utterances did not differ

significantly. The chi square statistic for differences in response patterns was 11.47 ( $p > .05$ ). Differences in the adult strangers' responses to these two groups are evident primarily in the topic related responses; that is, there are fewer extensions (both immediate semantic extensions and within turn extensions) and more repetitions/expansions provided to the SLD than the AM child. These data are very similar to that of the mothers interactions with these two groups of children. However, unlike the mothers, the strangers were similarly likely to control the conversation, respond to the child's action, and provide a routine-like response with SLD and AM groups.

#### LM and AM groups

Chi square for the comparison of adult stranger responses to these two groups of children was 15.85 which is significant at the .05 level of confidence. As with the mothers, the strangers used more semantic extensions, and fewer adult controlled utterances and responses to the child's activities with the AM children than they did with the LM group..

#### Functions of Adult Stranger Speech

Figure 5 illustrates the relative frequencies of functions of the adult strangers' utterances with each of the three groups of children. Results for individual subjects are provided in Table 6 in Appendix C. Chi square

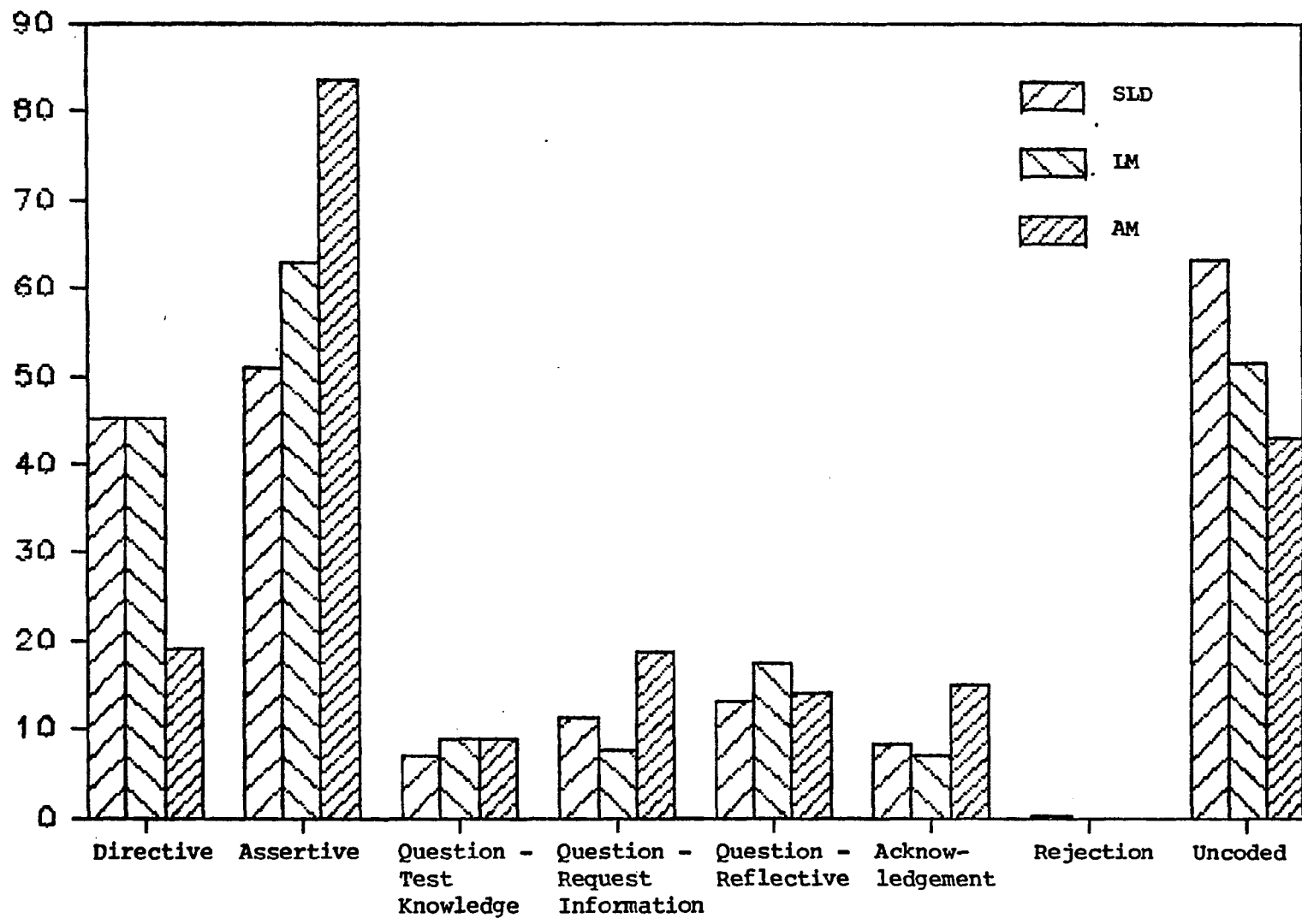


Figure 5. Average frequency of utterances (out of 200) in each functional category used by strangers with specific language disordered (SLD), language-matched (IM), and age-matched (AM) children.

tests of significance for differences in distribution of functions again revealed the striking influence of the child, in particular his/her language level, on the adults functional uses of language.

#### SLD and LM groups

The functions of utterances provided by the adult stranger to the SLD and LM children were very similar. The chi square statistic for determining differences in distribution of utterance functions was 2.53 ( $p > .05$ ). As illustrated in Figure 5, no categories differentiated between these two groups.

Figure 5 shows that the SLD and LM children were provided with relatively fewer directives than assertives, reflective questions were presented more often than test questions or information gathering questions, and there were no rejections of the child's utterance or activity.

#### SLD and AM groups

The functional aspects of the stranger's utterances to the SLD children differed significantly from those heard by AM children. Chi square was 14.53 ( $p < .05$ ). These differences are very similar to those noted in the maternal language and therefore again appear to be strongly influenced by the child. The adult stranger directed the AM child less and provided more assertive utterances, questions to gain information and acknowledgements.

## LM and AM groups

Though differences in the strangers' utterance functions did not differ significantly between the LM and AM groups (chi square was 11.28,  $p > .05$ ), trends similar to the differences between the SLD and AM groups were found. In other words, the adult stranger did less directing and more asserting, and used more acknowledgements and questions intended to gain information with the AM than the LM child.

### Adult Strangers' Use of Other Conversational Features

The adult strangers' use of the conversational parameters self repetitions, utterances which continue a conversational turn, utterances which are not related to the child's focus, and nonresponses with each of the three groups of children is illustrated in Figure 6. Data for individual subjects are provided in Table 7 in Appendix C. The Mann-Whitney U test was applied to each individual category to determine the significance of differences between the groups.

As with the mothers, there were significant differences between the AM group and each of the other two groups on the conversational parameter self repetitions (AM and SLD,  $p < .05$ ; AM and LM,  $p = .014$ ). Thus, adult self repetitions also appeared to be influenced by the child's language abilities rather than by age or cognitive factors and these abilities were apparent to the stranger during interaction with both SLD and normally developing children.

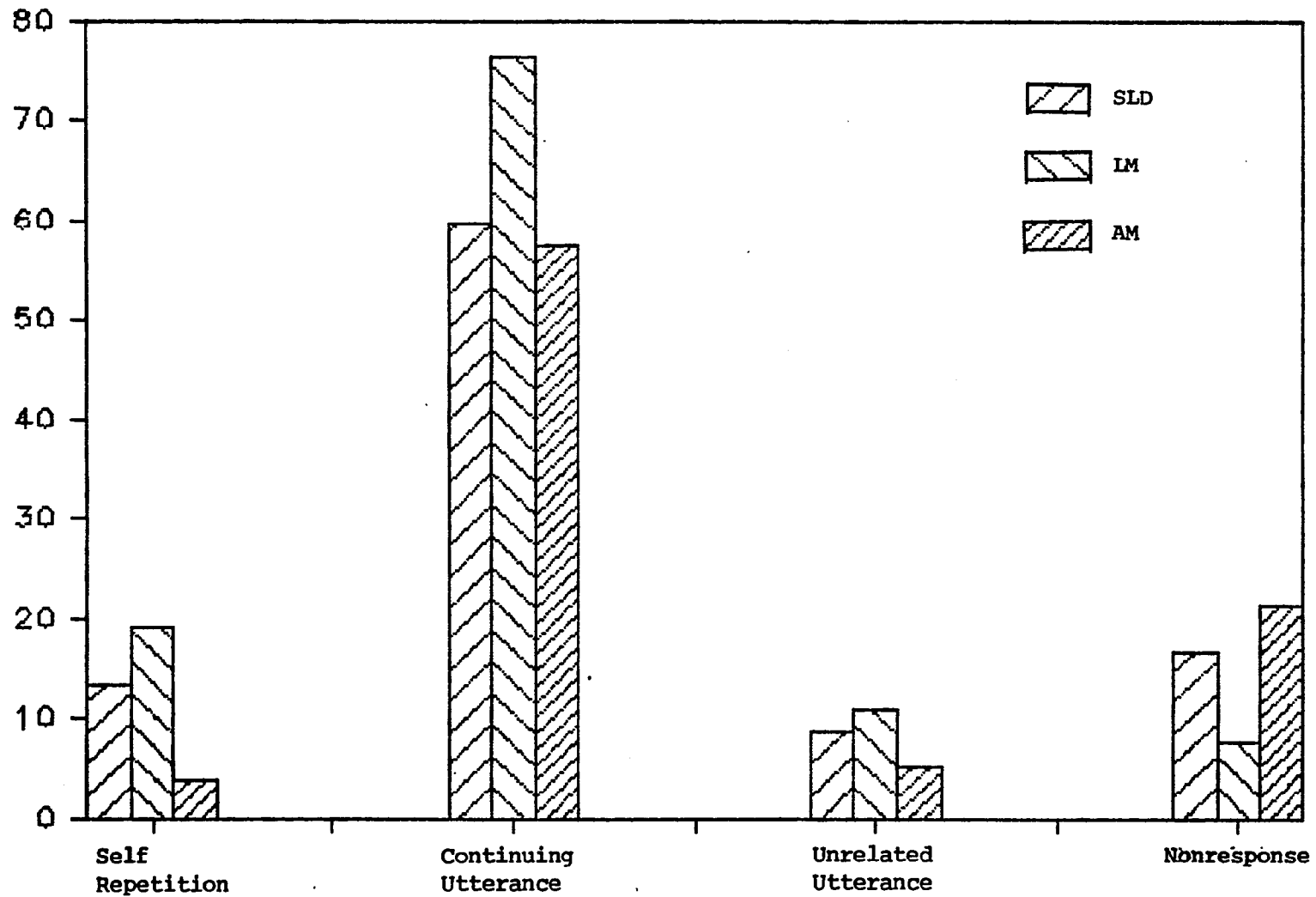


Figure 6. Average frequency of occurrence (out of 200 utterances) of 'other conversational categories' used by strangers with specific language disorders (SLD), language-matched (LM), and age-matched (AM) children.

There were generally no differences in the number of utterances per turn provided by the strangers for each group of children ( $p > .05$ ). As with the mothers, however, adult strangers tended to provide fewer utterances per turn to the SLD than the LM children.

There were no differences in the frequency of strangers' use of the two conversational parameters, 'utterances not related to the child's focus', and 'nonresponses' with the three groups of children. These results are unlike those found with the SLD mothers.

#### Strangers' MLU

The strangers' MLU with each of the three groups is illustrated in Table 11.

Table 11. Individual and mean MLU for strangers in each of the three groups of children.

Group	SLD	LM	AM
Subjects			
Stranger 1	4.26	4.63	6.58
Stranger 2	5.47	4.65	5.77
Stranger 3	5.03	4.84	6.30
Stranger 4	5.63	4.53	5.50
Mean	5.09	4.66	6.04

The Mann Whitney U test revealed significant differences between both SLD and LM groups when compared to the AM children (SLD vs LM,  $p > .05$ ; SLD vs AM,  $p = .029$ ; LM vs AM,  $p = .014$ ). Thus, the adult stranger's utterance length was higher for the children with greater linguistic abilities. It is likely that significant differences were found with the strangers but not the mothers because the same adult

was used with one child from each of the three groups thereby eliminating stylistic differences.

Data Comparing Maternal and Adult Linguistic  
Interaction with SLD Children

One aim of this study was to discern what factors influenced maternal linguistic interaction with SLD children. Of particular concern were those discourse and functional aspects which were different from those used with non-impaired children, especially those factors that have been associated with children's rate of language development. Lieven's (1978) findings with two normally developing children with similar MLU suggested that the children's differing styles had a strong influence on the adult interaction. If differences in mothers' interaction are responsive to the child then differences in these factors should also be observed with the adult stranger.

As discussed in a previous section, the SLD mothers' linguistic interaction with her child appeared to be primarily influenced by the child's linguistic level. Response types, utterance functions, and use of self repetitions in the SLD mothers' language were very similar to those in the LM mother-child dyads. The same results were found when the strangers interacted with the three groups of children. This finding reinforces the hypothesis that the child's language capabilities influence the pragmatic components of the adult-child interaction.

Figures 7, 8, and 9 illustrate the discourse and conversational aspects used by the mothers' and strangers' during interaction with the SLD children. The total frequencies for each group as well as individual subject results are shown. There is a striking similarity in both the mothers' and strangers' response types and functional features with these children. These aspects of adult talk to children are largely cued by the child in interaction with adult strangers as well as mothers.

The category 'within-turn extension' is also probably cued by the child although this feature does not appear to be related to the child's MLU as are the other features. The mothers of the SLD children did not produce 'within turn extensions' as frequently as the LM mothers. The strangers also used this category more with the LM and AM children than with the SLD group (see Figure 4). The mothers and strangers also used fewer utterances per turn (i.e., fewer 'continuing utterances') with the SLD child than with the LM children.

The mothers' use of 'utterances not related to the child's focus' and 'nonresponses' did not appear to be responsive to the child's language abilities. As shown in Figure 9, the mothers were more likely to use these features with the SLD child than were the strangers. Though differences between mothers and strangers were not significant, the strangers used more of these features than did the mothers with both of the nonimpaired groups (see

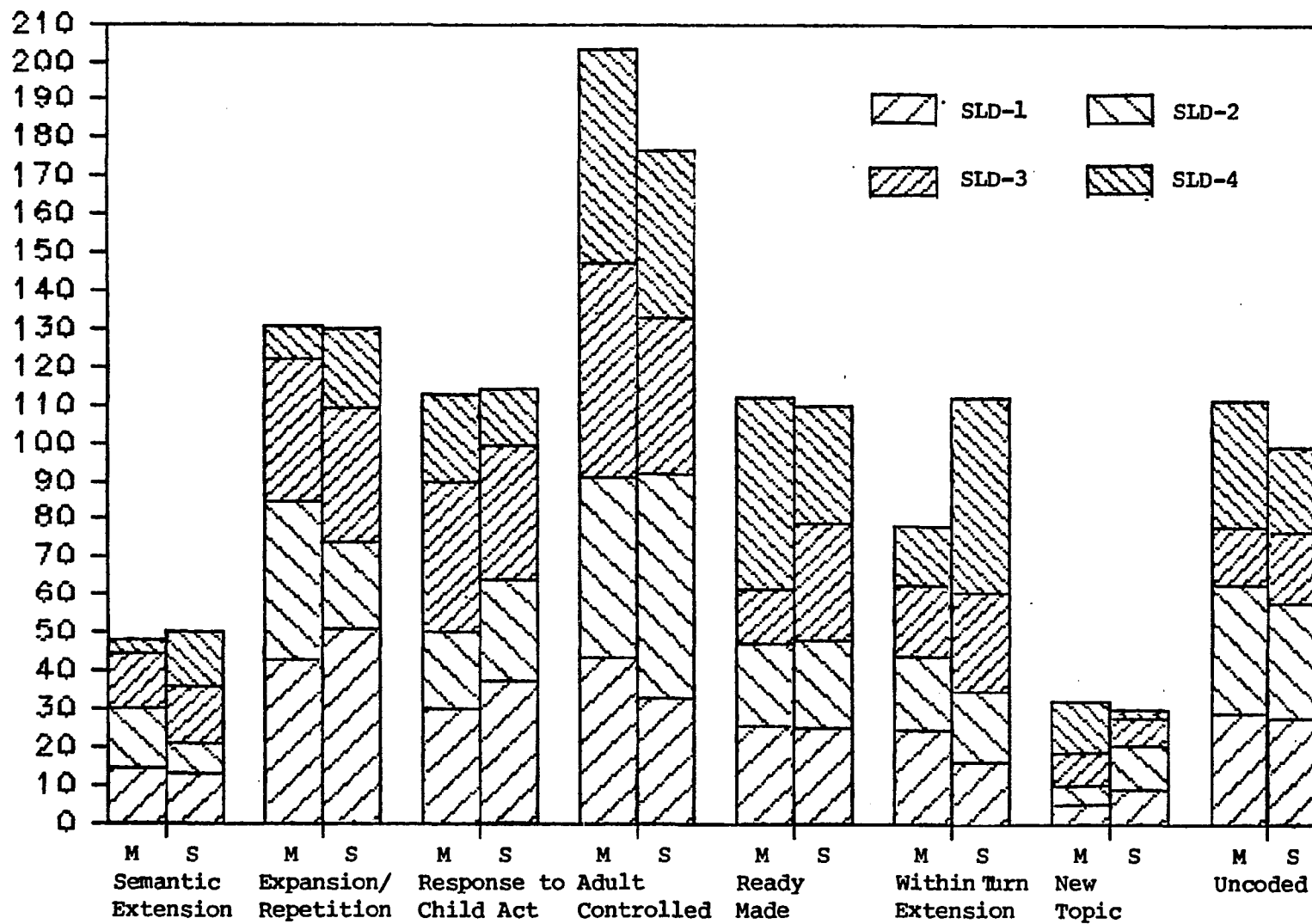


Figure 7. Individual and group frequency of each response type in the speech of mothers (M) and strangers (S) with specific language disordered (SLD) children.

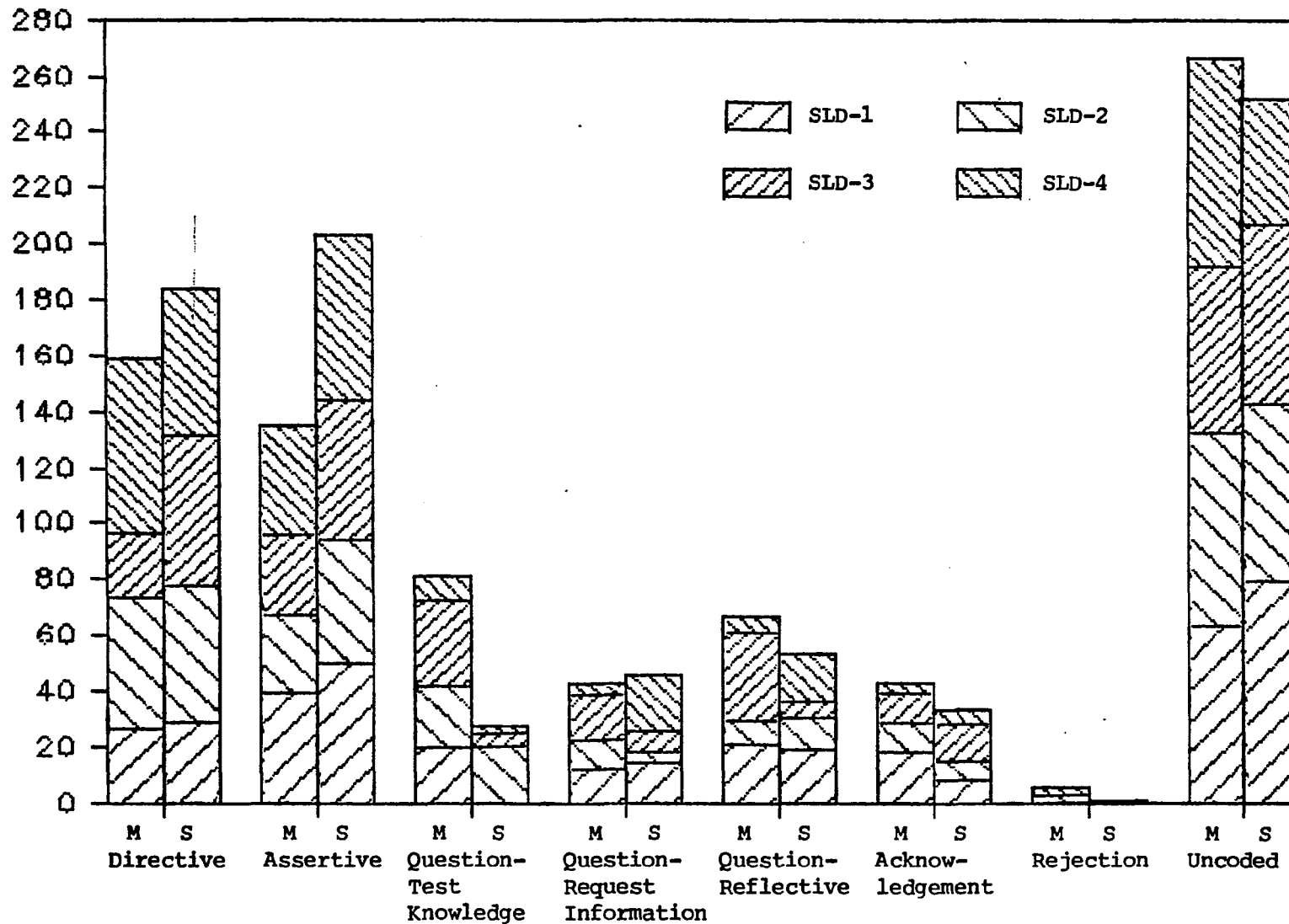


Figure 8. Individual and group frequency of each function category in the speech of mothers (M) and strangers (S) with specific language disordered (SLD) children.

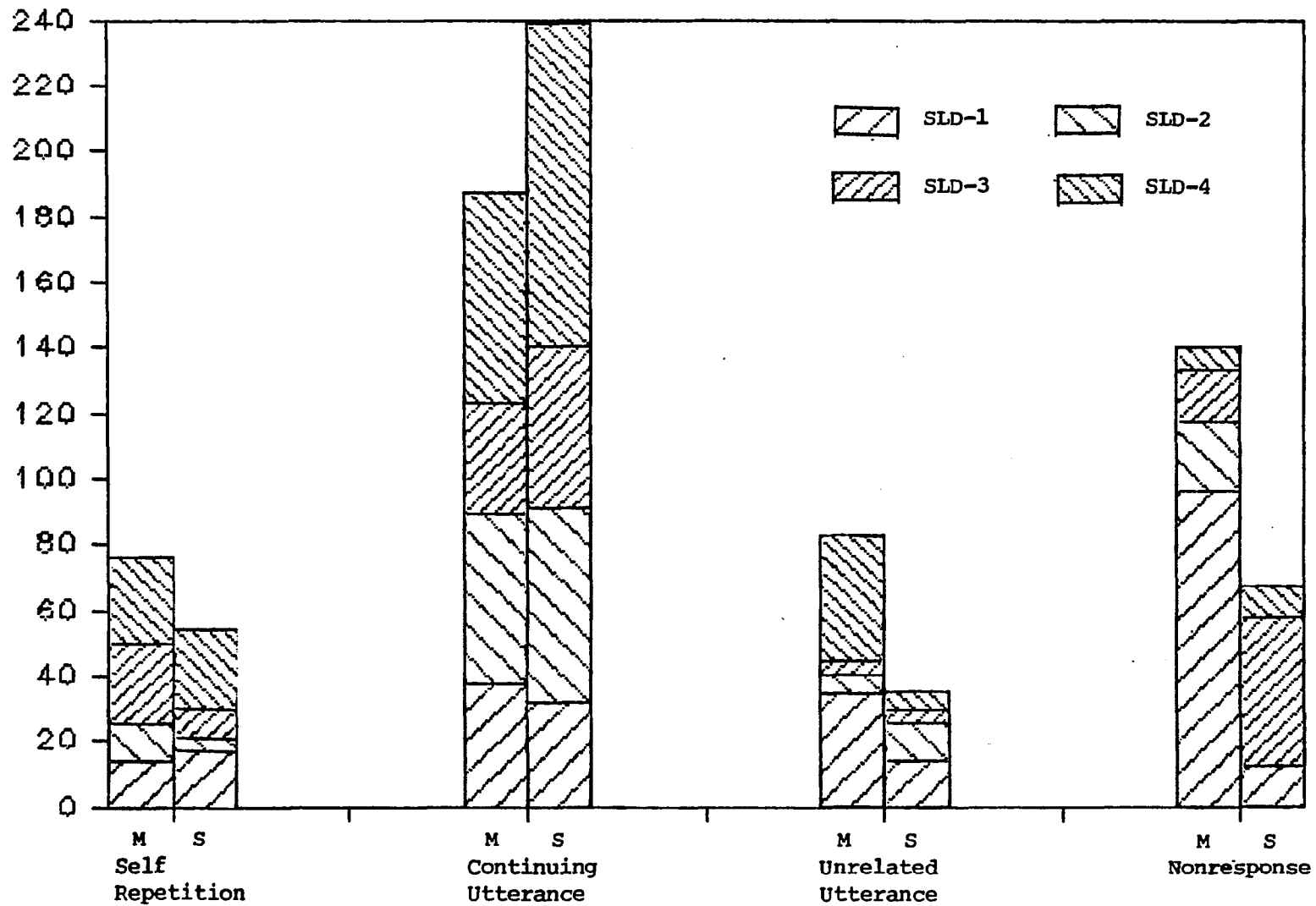


Figure 9. Individual and group frequency of each 'other conversational category' in the speech of mothers (M) and strangers (S) with specific language disordered (SLD) children.

Table 7 in Appendix C). This suggests that these features are related to mothers' strategy for interacting with her SLD child.

Group differences obscure the large individual differences in mothers' use of unrelated utterances and nonresponses. As shown in Table 12, the standard deviations for SLD mothers' was greater than that for mothers of either of the other two groups. Results of the F test of sample variances indicated that variability among SLD mothers on each of these two features was significant ( $p < .05$ ) or approached significance ( $p < .10$ ). Such variability suggests that caution should be exercised regarding conclusions about mothers of SLD children as a group. This point is even more meaningful when considering the care exercised in this study to obtain homogeneity of the SLD group.

---

Table 12. Standard and F test of sample variance for SLD and normally developing groups on the conversational features 'utterances not related to the child's focus' and 'nonresponse' in mothers' talk.

---

Variables Groups	Unrelated to child focus		Non response	
	SD	F value	SD	F value
M-SLD vs M-LM	18.32 5.62	10.63*	41.08 3.86	113.12***
M-SLD vs M-AM	4.51	16.5**	11.90	11.91*
M-SLD vs S-SLD	4.57	16.04**	19.55	4.41 *( $p < .10$ ) **( $p < .05$ ) ***( $p < .01$ )

---

CHAPTER FOUR

SUMMARY AND DISCUSSION

This study examined the content and function of the conversation of mothers and adult strangers with children who have a specific language disorder (SLD), language matched normal children (LM), and age matched normal children (AM). There were four major findings. One finding was that the parents' and strangers' conversational interaction patterns were largely influenced by the child's level of language as defined by mean length of utterance (MLU). A second major finding was that, unlike the results reported in previous literature, the mothers of SLD children did not use fewer semantically related responses or more directives than mothers of the language matched children.

The third major finding was that mothers of SLD children used more utterances which were not related to the child's focus of attention than the mothers of normally developing children. The SLD mothers were also less responsive to their child's utterances than either of the groups of mothers of nonimpaired children. The adult strangers, in contrast, did not use a similar proportion of these parameters during their interaction with the same SLD children. This result was striking given the remarkably consistent distributions of other discourse and functional

parameters of mothers and adult strangers during interaction with the SLD and nonimpaired children.

The fourth major finding was that there were extreme individual differences among the mothers of SLD children primarily with regard to the two conversational parameters which differentiated them from the other mothers and adult strangers. A post hoc analysis of the data suggested, however, that these maternal interaction strategies may be influenced by specific aspects of the SLD child's language or other behaviors.

#### Discussion

The results of this study shed light on the nature of adults' talk with children in general as well as the SLD child's linguistic environment in particular. The findings are consistent with the notion that adults do modify their language to nonimpaired and SLD children in largely predictable ways.

The findings of this study lend strong support to the hypothesis that the child's linguistic abilities influence discourse and functional aspects of the adult interaction regardless of the child's age or nonlinguistic cognitive capacities. The extent and nature of these adjustments by both mothers and adult strangers have broad implications for the motivation behind adults' child-directed talk to normally developing and SLD children as well as for the

adequacy of the linguistic environment as a language learning model.

The results of this study also indicate that some aspects of the SLD mothers' linguistic interaction is different from that of the normally developing language-matched child. These aspects could be argued to be nonconducive to the child's language learning. It is speculated, however, that these features may be cued by other child behaviors or by aspects of the SLD child's language that may be different from that of the normally developing child matched on the basis of MLU.

The following sections will address the issues regarding the SLD child's environment and consider why these differences may have occurred.

#### Response vs. Strategy; The Influence of the Child's Language

Adult-child conversational interaction is characterized by reciprocal, sequential linguistic contributions. That is, adults and children take turns in the conversation even though there is assymetry in each interactant's linguistic abilities and contributions particularly during the language learning years (Kaye and Charney, 1981, Bloom, Rocissano and Hood, 1976, Levinson, 1979). Based on the findings of this study, the adults' discourse and functional contributions to the conversational exchange appear to be largely responsive to the child's language level. Through the use of a unique

population of children who were language impaired though cognitively intact, impelling evidence was provided to suggest that language abilities, rather than cognitive or age factors, determine the nature of the adults' conversational linguistic adjustments. That is, the less sophisticated language users (SLD and LM children) were provided with a significantly different linguistic interaction by both mothers and strangers than were the more language sophisticated AM children.

Recently various researchers have implied that adults' child directed language is determined by the underlying strategy or intention of the mother to either control and direct behavior or elicit conversation from the child (Olsen-Fulero, 1982, McDonald and Pien, 1981). These studies failed to take into consideration the influence of the child on the interaction, particularly his/her linguistic capacities. If, as the results of this study suggest, the adult adjusts to the child's language level, the relative frequency of use of directive vs. conversational eliciting utterances may not reflect an underlying maternal strategy as much as a response to a particular child's linguistic level or other conversational factors such as willingness to converse and respond.

An illustration of the potential influence of the child's language on the adult interactional style is provided by a closer look at the language of two of the strangers' during interaction with a child from each of the

three groups. An ad hoc analysis using the directive vs. conversational eliciting categories similar to those of McDonald and Pien (1981) revealed that Stranger 1 used roughly equal amounts of directives and conversational eliciting utterances with the SLD-1 and LM-1 children, however, she used twice as many conversational eliciting utterances than directives with the AM-1 child. Like Stranger 1, Stranger 2 produced nearly twice as many conversational eliciting utterances than directives with AM-2, however, she used directives approximately twice as often as conversational eliciting utterances with SLD-2 and LM-2. Thus, though stylistic differences may exist, there is clearly evidence that the child's language has an effect on the relative proportion of directives and language eliciting utterances in the adult's child-directed talk.

#### Implications for Language Learning

The fact that adult language to children is geared to variation in linguistic skills, rather than age or cognitive factors, favors the hypothesis that the linguistic environment is appropriate for the child's language learning needs (Cross, 1977, 1978). That is, by responding to the child and adjusting discourse and functional aspects of their language to the child's linguistic level, the adult is providing a scaffolding within which the child can produce more effective pragmatic, semantic, and syntactic contributions (Lieven, 1984, Barnes, Gutfreund, Satterly and

Wells, 1983). This scaffolding is child-centered in that it refers to the child's interest and activities and is sensitive to the topic of the child's utterance.

This does not mean that adult speech to children is primarily motivated to provide a set of language learning lessons. In fact, the striking similarities of mothers and strangers with each of the three groups of children would underscore the notion that the language learning benefits may be secondary to the motivation to maintain the conversational interaction with the child. Though mothers may express an interest in teaching their child language it does not seem probable that the stranger would harbor a similar set of intentions. Rather the stranger would probably be interested in maintaining the interaction with the unfamiliar child since their instructions were to "interact with the child" for the prescribed period of time.

A by-product of this intent to maintain the interaction, however, may be a beneficial linguistic model for language learning. It is speculated that the extent and nature of conversational and functional aspects of the mothers and adults linguistic interaction with children at different levels of language development are conducive to the child's linguistic learning. How these varying aspects of adult-child language may facilitate learning is discussed in the following sections.

### Semantic Relatedness

Mother and adult utterances which are topically related to the child's utterance provide feedback as to the communicative adequacy of language the child produces. Repetitions, expansions, and extensions also allow the child to compare his/her utterance to those of others within a focused conversational frame (Lieven, 1984). According to Cross (1977, 1978) and Snow (1978) these responses provide the child with highly salient semantic and syntactic information which is assumed to be conducive to the child's language learning.

For each of the three groups of children in this study, adults provided a similar proportion of utterances which were semantically contingent on the child's previous utterance. Variation was evident in the extent to which the adult provided additional semantic information while maintaining the child's topic. For the less sophisticated language groups (SLD and LM), the mothers and adults used proportionally more repetitions and grammatical expansions whereas topic related utterances containing additional semantic information were more frequently used with the language mature AM children.

Repetitions and expansions add little to the subject matter of the conversation. They maintain contact with the child while adding emphasis or giving reassurance to the adequacy of the child's utterance to the situational context (Martlew, 1980). The role of these responses, particularly

grammatically expansions, in the child's language learning has been found to have little effect on the rate of the child's syntactic acquisition (Cazden, 1965). As pointed out by Shatz (1982), however, what is learned by the child depends on his/her existing knowledge and learning processes. It is important to consider here that, since repetitions and grammatical expansions do not add semantic information to the child's utterance then one might argue that these responses would reduce the amount of processing that the child has to do to understand the structure of what was said (Shatz, 1982). Thus, these types of responses would be more appropriate for the SLD and LM children with less sophisticated linguistic abilities.

Additionally Bloom, Rocissano, and Hood (1976) have reported that children at a similar stage of language development as the SLD and LM children in this study produce adjacent through largely noncontingent utterances in their speech. That is, they take their conversational turn but do not frequently formulate utterances which are semantically related to the adult's previous utterance. Thus, the adults' use of repetitions and expansions of the child's utterances, while functioning well to maintain the conversational interaction, may also contribute to the child's learning of topic relevancy in sequential contributions to the conversational frame.

Semantic extensions, on the other hand, were more frequently used with the AM children who had more advanced

linguistic capacities than either the SLD or LM children. Semantic extensions, like repetitions and expansions, enable the adult to maintain the conversational topic of the child's utterance. However, unlike repetitions and expansions, they include semantic elements which are both the same as and different from the child's preceding utterance. These additional semantic elements add to the processing load required for the child to understand the utterance. Semantic extensions may also be a "richer" response which may aid in maintaining the child's attention (Brown, Cazden, and Bellugi, 1969) and facilitate the learning of semantic and syntactic aspects of the child's language (Cazden, 1965, Scherer and Olswang, 1984).

#### New Topic Responses

The small proportion of new topic responses for each group of children demonstrates that the adult rarely changes the topic of conversation. This would also appear to promote ongoing conversational maintainance for both the higher and lower level language groups.

#### Adult controlled utterances

For the child at a lower level of language development (SLD and LM) adults took control of the conversation with sequential topic related utterances more so than for the higher language level AM children. This greater responsibility taken by the adult in continuing and

maintaining the conversation with the SLD and LM children is probably the result of the limited contributions that children at this stage of language development make to the topic maintenance of the conversation (Bloom, Rocissano, and Hood, 1976) The adult, therefore assumes a primary role in maintaining a topic from turn to turn with the less sophisticated language users (SLD and LM).

Adult controlled utterances, for the most part, did not appear to be designed to divert the child's attentional focus. With the exception of two SLD mothers use of adult controlled utterances (discussed in a following section), the use of these utterances were related to the child's focus of attention. Furthermore, a majority of these utterances were questions or directives which functioned to elicit behavioral or linguistic responses from the child. Thus, they were apparently used to maintain the interaction and the conversational exchange with the child.

It should be pointed out that stranger variation in the use of adult controlled utterances for each group of children was not as great as noted for the mothers, although the same trends were evident. That is, each stranger individually produced fewer adult controlled utterances for AM than the other two children (SLD, LM). It may be that the adult stranger was less willing than the mother to exert control over the conversation with an unfamiliar child.

### Ready Made Responses

A complementary finding to the mothers' frequent use of adult controlled utterances with the lower level language groups is the relatively lower use of simple routine-like ready made responses with these groups. Alternately, the higher level language children received many more ready made responses. These routine-like responses carried little propositional content and were primarily responsive to a child's question or comment. Unlike the adult controlled utterances, these utterances placed little constraint on the conversational topic and appeared to function to maintain the adult turn in the conversational exchange with the child while allowing more responsibility for the child in producing a propositional utterance. They also are probably responsive to the AM child's apparently greater use of questions requesting this feedback from the adult. Examples of the complementary nature of adult controlled and ready made responses are given in the following exchanges between the mother/adult and child:

Example (LM - 1) - Adult controlled (sequence of utterances)	
<u>Mother</u>	<u>Child</u>
(C playing with teapot and cup)	
Are you gonna make more tea for you?/	
Some tea?	No/
Is there more in there?/	Yeah/
Okay careful it might be hot/	Yeah/
Can I taste it?/	Yeah/
	Okay/

Example (AM - 1) - Ready-made responses

<u>Mother</u>	<u>Child</u>
(C playing with fences and animals from the farm set)	Now we gotta put the fences up/Put them back here/
All right/	
	They get to go back here, right?/
Uh huh/	
	That's where the fences go, right Mom?/
M Hm/	
	There supposed to be more fences/ They don't, they don't let the cows escape, right?/
I guess not/	

The above examples lend evidence to the increasing responsibility taken by the more linguistically sophisticated child in the conversation and the different nature of the maternal responses.

#### Self Repetitions

The mothers' and adults' higher proportion of self repetitions with the lower language level children is consistent with the findings of previous studies (Cross, 1977, Newport, 1976). This redundancy in mother and adult speech may be in response to the child's lower level of receptive syntactic comprehension which was at least one standard deviation below the mean when compared to age peers on a standardized measure of grammatical comprehension (see Methods chapter). Thus, an adult may

provide repetition to the lower level language users (SLD and LM) because of the child's inability to process or respond to the original utterance (Snow, 1972, Cross, 1977). The higher level language users (AM children) heard fewer repetitions presumably as a result of their better abilities to attend to and respond appropriately to the adult utterance. This redundancy may also be a by-product of the mothers' and adults' motivation to maintain conversation with the child. An utterance understood by the child is more likely to receive a response, thus maintaining the conversational exchange.

#### Directives and Assertives

The results of this study indicate a complementary relationship in the use of directives and assertives for the SLD and LM children on one hand and the AM children on the other. For the lower language level children (SLD and LM), directives were proportionally more frequent than assertives, whereas the opposite relationship existed for the AM children. These results are consistent with those of Newport (1976) who found a decrease in imperatives and increase in declaratives (the categories of directive and assertive roughly corresponds to Newport's sentence form categories) with increasing age of normally developing children. Newport, however, claimed that these differences in mothers language to children of different ages were a result of cognitive differences in the listeners, i.e., the

younger, less cognitively mature child required more direction than the older child. These findings do not support this claim. Rather, they provide support for the notion expressed by White and White (1984) that directives can be useful conversational ploys with a language limited partner. White and White emphasize that direct imperatives are short, stressed, in the "here and now" and usually accompanied by a gesture so they are more easily processed. Furthermore, they function to maintain contact with the listener without requiring a verbal response,

The role of directives in child language learning is somewhat controversial. Most researchers have found a negative relationship between the use of directives and language learning (Nelson, 1973, Kaye and Charney, 1981, Clarke-Stewart, 1973, Wulbert, Inglis, Kriegsmann, and Mills, 1975). However, Barnes, Gutfreund, Satterly, and Wells (1983) recently reported findings that mothers' use of directives with two year old children whose MLU placed them within Brown's (1973) Stage 1 (the same as the SLD and LM children in this study) was positively related to language growth measured nine months later. Barnes et. al. point out that maternal input features associated with progress in children's language probably change as children mature. At the restricted age range of the children in the Barnes, et. al. study, directives may have a particularly important linguistic function in pointing up the relationship between form and situated meaning.

Alternately, at a later age, an emphasis on directing and controlling the child's behaviors may limit rather than aid language acquisition.

Assertives, on the other hand, are generally comments and they function for various specific purposes such as to provide information, express feelings, state rules, explain or describe. In each of these cases the adult maintains contact with the listener without necessarily eliciting a verbal or nonverbal response. For the child with lower language abilities who does not supply contingent responses these would then be less useful in maintaining the interaction. On the other hand, for the higher language level children, the child may be more likely to supply a contingent response (Bloom, Rocissano, and Hood, 1976) thereby influencing the adult to provide a higher proportion of these utterances.

#### Continuing Utterances

Both mothers and strangers provided, on average, fewer than two utterances per conversational turn. This indicates that the adult does not dominate the conversational turn regardless of her partner's limited linguistic abilities. Cross (1977) notes that the use of fewer than two utterances per turn may increase the perceptual salience of the information contained in any single utterance and that it also gives the child ample opportunity to practice his/her developing linguistic

abilities.

It is of note that the SLD children received relatively fewer utterances per turn than the LM children. This was found for both the mothers and strangers and therefore appears to be cued by the child. Related to this finding is adults' use of 'within-turn extensions'. These utterances add information to the initial utterance in the conversational turn. Such 'within-turn extensions' are of interest because of their relative paucity of use with the SLD children by both mothers and strangers, whereas the LM children heard roughly similar proportions of these as the AM children. The SLD group thus received repetitions or grammatical expansions of their utterances similar to the LM children; however, the latter group was then often exposed to additional semantic information ('within turn extension') within the conversational turn.

An explanation for these findings is suggested by data from Cross (1978) who found that mothers of language accelerated children produced fewer utterances per turn than mothers of normal language developing children. This may have been a result of the child's greater willingness or ability to take an equal role in the conversation. In this regard, it is possible that the SLD child was better able to participate in conversation than the LM peer. However, if this were the case, one would not expect the high frequency of adult controlled and directive utterances in the SLD mothers' language. Additionally, a recent

examination of the SLD child's pragmatic abilities revealed that these children do not initiate conversation as frequently as non-impaired children (Conti-Ramsden and Friel-Patti, 1983). Therefore, it is speculated that the child may have signaled a reduced capacity to process or respond to the input when more than one utterance in length, particularly when it contained additional semantic information. This hypothesis is supported by the comprehension data which may explain the differences in the SLD and AM children (the SLD children showed a significant deficit in grammatical comprehension when compared to age peers on standardized testing). The differences in adults' utterances per turn with the SLD and LM groups, however, cannot be accounted for in this study. Future research of adult interaction with SLD children with varying comprehension capacities (including the ability to comprehend and integrate meaning in two or more utterances) might aid in discovering the effect of this factor on the adult interaction.

#### The SLD Child's Linguistic Environment

As discussed in previous sections, the mother and stranger produce language with the SLD children which is, in most respects, like that of mothers and strangers interacting with the younger language matched child. In light of the SLD child's older age and normal nonlinguistic

cognitive capacities, it appears that language level is the primary factor in influencing the content and function of the adults conversations.

For some of the SLD mothers, however, there are differences in two of the conversational parameters that do not appear to be responsive to the child's language, and it is speculated in the following sections what factors may account for the mothers' frequent use of these features. How these may influence the child's language learning is also considered.

This study did not provide answers to what factors "caused" the child's language disability. As pointed out by Cross (1984), there is yet no evidence for the strong argument that the nature of the maternal interaction can precipitate the child's language difficulties as has been implied (Wulbert, Inglis, Kriegsmann, and Mills, 1975, Petersen and Sherrod, 1982). However, the results of this study do suggest that there are aspects of some mothers' speech to the SLD child that may have been affected by the child's disability and that it is possible that the resultant maternal interaction may exacerbate the child's problem.

#### Semantic Relatedness and the SLD Child's Linguistic Environment

The mothers of the SLD children in this study provided semantically contingent responses to their child's

utterances as frequently as the nonimpaired mothers. This aspect of their linguistic environment thus appears to be similar to that of younger language matched children. These results are not consistent with those of Newhoff, Silverman, and Millet (1980) who found that language disordered children received significantly fewer of these responses than did the nonimpaired children who were matched by language level. One explanation for the differences in these studies is the possibility that extreme individual differences, as found with two maternal parameters in this study, may have skewed the groups results. It is also possible that the children in the Newhoff et. al. study were different from those used in this study. They did not provide evidence for normal nonlinguistic cognitive maturity in their language disordered group and thus they may not have included only specific language disordered children in their study. They also did not match for SES, birth order or sex in the normally developing group, factors which may be important to the interaction (Clarke-Stewart, 1973, Tulkin and Kagan, 1972, Cherry and Lewis, 1978, Nelson, 1973).

Though the mothers of SLD children in this study were like the mothers of normally developing children in their use of responses semantically related to the child's utterances, they did not provide their child with as many utterances related to their attentional focus as did the LM and AM mothers. It is thus apparent that the relationship

of the adult input to both the verbal and nonverbal context of the interaction must be considered. A higher frequency of utterances unrelated to the child's attentional focus has also been reported in previous studies of language disordered children (Petersen and Sherrod, 1982, Tiegerman and Siperstein, 1984) and slower learning nonimpaired children (Cross, 1978).

However, a look at the individual data for the mothers of SLD children reveals that only two of the four SLD mothers accounted for the high proportion of unrelated utterances, therefore, conclusions about these mothers as a group are not warranted. The mothers of SLD-1 and SLD-4 produced 17 and 19.5 percent utterances respectively which were not related to the child's focus of attention. The percentage of usage of this parameter for the mothers of the other two SLD children was 3 and 2 and the highest for any of the mothers of nonimpaired children was 7 percent.

A post hoc analysis of the context in which the unrelated utterances in this study occurred revealed that SLD-1 played with the wooden train for the entire 10 minute warm-up period and at least five minutes into the ten minute period which was analyzed. SLD-4 played with the train for most of the remainder of the session whereas SLD-1 then then switched to play with the farm for most of the remainder of the period analyzed. Further analysis of the data for each of these subjects indicated that the mother of SLD-1 produced 12 of the 34 total unrelated

utterances to divert her child from play with the train and 20 unrelated utterances to divert her child from his farm play. SLD-4's mother, on the other hand, produced 34 of the 39 utterances unrelated to the child's focus apparently to divert him from his play with the train and interest him in the other toys available.

When the strangers interacted with these two children they again played with the same toys for a similarly long period. Though the strangers also attempted to divert the child's attention to other toy contexts, they did not persist in their attempts as did the mothers, but choose to continue the interaction in the context of the child's chosen interests. It is hypothesized that the mother may have been more interested in expanding the child's play whereas the stranger was principally concerned with maintaining the interaction.

Additionally, it should be noted that the mothers of the other two SLD children also produced unrelated utterances designed to interest them in other toys. In both cases, however, the children generally responded to their parents attempts by changing their play activity.

Thus, the child, through his/ her activities and interests contributes to the language learning context. This relationship between the language impaired child's nonverbal behaviors and maternal interaction has not been ignored in the literature. Studies have cited such nonverbal behaviors as the child's passiveness (Cunningham,

Reuler, Blackwell and Deck, 1981, Jones, 1977) in determining the adult's input. Tiegermann and Siperstein (1984) reported that a mother of a language impaired child in their study produced unrelated utterances by talking about activities after the child had ceased to be interested in them. The child's shifting attention to objects may have contributed to the mother's language. Wells (1980a) noted that differences between children such as curiosity and responsiveness are likely to lead to different forms of adult interaction.

When considering whether mothers overuse of unrelated utterances with the two SLD children is part of the mothers style or cued by the child, it appears that both elements might be involved. Though not responsive to the child's language level, there were aspects of the child's nonverbal behaviors that appeared to cue the use of some of these utterances. In other words, it was apparently a strategy of these two mothers' to interest their children in a wider variety of play contexts, yet this strategy appeared to be in response to the child's concentration on only one or two of the toys.

Regardless of what factors influenced the use of unrelated utterances, the end result is that these children heard a greater proportion of language that was not tied to the immediate context and the child's attentional focus. It could be argued that this is nonconducive to the child's learning of the linguistic code.

The potential importance of these differences in the child's linguistic environment has been speculated on by various researchers. MacNamara's (1972) theoretical construct of language learning emphasizes the importance of the child's cognitive understanding of context in enabling him/her to decipher the arbitrary rules of syntax and morphology. Snow (1977) and Lieven (1984) add that language acquisition occurs in the context of activities which are shared by the child and caretaker. Even nativists such as Fodor (1966) acknowledge that the correlation between the language the child hears and nonlinguistic events is crucial to the child's linguistic acquisition. If SLD children hear a large proportion of utterances which do not encode their current attentional focus, then perhaps their linguistic environment does not provide them with the maximum opportunity to learn the linguistic code.

#### Nonresponse and the SLD Child

Mothers of SLD children as a group provided significantly more nonresponses to their children than did mothers of LM children. Individual differences in these mothers use of this parameter were also significant. One of these mothers (SLD-1) did not respond to her child's utterances as frequently as 96 times during the course of 200 utterances, whereas the mother of SLD-4 used only seven nonresponses which is more like the mothers of the normally

developing children.

Certainly one might argue that a parent who does not take advantage of their turn in a conversation is not a conscientious conversational partner. According to Lieven (1978b) the importance of turn taking may be that the exchange of utterances within a shared context will allow appropriate notions of responding to develop. Since the strangers were not as likely to neglect their conversational turn, it appears then that this aspect of the mothers' behavior is part of her style of interaction.

A post hoc analysis of the data, however, indicated that some of the maternal nonresponses occurred when the child was involved in solitary play. Adult nonresponse during children's solitary play was also reported by Levinson (1979) for nonimpaired children who were at approximately the same stage of language development as the SLD children in this study. It is possible that the SLD children in this study spent more time in solitary play than the normally developing LM children thus prompting the higher degree of maternal nonresponse.

A further look at the data also showed that the SLD children often produced sequential topic related utterances when the mothers used nonresponses. Therefore, it is possible that the mothers used this strategy to encourage more conversational initiation by the child, which SLD children reportedly do infrequently (Conti-Ramsden and Friel-Patti, 1983). This hypothesis is supported by the

significant negative relationship found between the SLD mothers' use of nonresponses and adult controlled utterances. That is, the mother of the SLD children appeared to use nonresponse as an alternative to taking control of the conversation. Further research into the mothers use of nonresponse would be helpful in determining what factors shape this maternal strategy and whether it may influence a child's conversational language skills.

#### Limitations of the Study

The most obvious limitation of this study is the quasi-experimental nature of the play session in which this data was collected. One might argue that this one-to-one situation was unnatural since parents rarely have the time in which to play alone with their child without any outside distractions. Furthermore, a videotaped play session in which the mother was told that her child's language was being studied might result in the mothers altering her interaction to best display her child's language. However, it is not likely that the strangers whose interactions were similar to the mothers would be motivated by this interest. The mothers similarities to the strangers thus argues against this interpretation.

A second limitation of this study involves the size of the sample studied. Results from twelve children, four in each group, certainly cannot be freely generalized to other parents and children. However, one of the points of this

study was the individual variability of the mothers of the SLD children. Therefore, it appears that extreme variability, particularly in the case of SLD children, may be the norm.

A third limitation of this study is that it did not directly analyze the child's language or other behaviors for its potential influence on adults. Linguistic variables such as the range and complexity of topics presented by the child and the variety of functions the child used language for might have an effect on the adult style. Furthermore, such nonverbal factors as attention span, curiosity, gaze behaviors and responsiveness are likely to lead to different forms of interaction. Though these factors were considered in this study, it is important to examine in more detail how these may affect the adult's interactional style and the child's language learning approach.

#### Suggestions for Further Research

This study could only speculate about the effect of the mothers use of certain linguistic parameters on the SLD child's rate of language acquisition. A carefully designed longitudinal study that examines the adult interaction and follows the child over a subsequent time period might begin to provide more definitive answers to questions about the relationship of maternal language and the child's rate of language learning.

Further experimental research wherein parents are trained on aspects of linguistic interaction which are thought to be conducive to the child's language learning might also be undertaken. This would provide further evidence as to the effects of adult language on the child's learning and this would have important implications for the clinical treatment of children with a specific language disorder.

Additionally, this study raised questions as to whether certain nonverbal behaviors including attention span and responsiveness might influence the maternal response. Further research into aspects of the SLD child's nonverbal behaviors in cueing this response from adults such as that by Constable and Lahey (1984) is warranted.

#### Conclusions

Children's language level is a strong factor in influencing many of the discourse and functional aspects of the adults' linguistic modifications. The motivation for the adults' adjustments appears to be primarily to communicate and take conversational turns with the child, and in order to do so, the adult takes cues from the child's linguistic capacities and formulates responses accordingly. The SLD children, whose age and cognitive abilities are discrepant from their language level, provide the strongest evidence for this conclusion.

Adult conversational turns with children are thus an

ideal source for language learning. They relate to the child's current cognitive understanding of the world around him/her, they are sensitive to the topic of the child's utterance, and they appear to be geared to the child's language and processing capacities. The child's role in language learning then is to decipher the arbitrary relationship between meaning (the environmental context) and sound (the adults' conversational turn). And it is the adult's responsibility to be willing to take turns with the child, picking up on the child's conversational topic and contextual interests.

The language that the SLD child hears is similar in many regards to that of the nonimpaired younger child. Thus, unlike the findings of previous research, this study suggests that the SLD mothers are sensitive to the child's language or other behaviors. Extreme individual differences in certain aspects of the linguistic interaction provided by the mothers of SLD children is evident. Some of the mothers of SLD children used a high proportion of nonresponses and utterances unrelated to the child's focus of attention. Use of these features can be argued to be nonconducive to the child's linguistic learning. Further analysis of the data suggested, however, that the mothers' use of these features may be shaped by certain characteristics of their SLD child's conversational language use or other behaviors. If so, decisions concerning whether clinical modification of the mother's

language is necessary must be carefully considered.

Further reseach to determine what influences the adults' interaction patterns and the effect of these on the child's language learning is warranted.

APPENDIX A

AGREEMENT FORM

This form is required by federal regulations governing research using human subjects. We hope your participation in this research project will be an interesting experience for you.

You are asked to sign this form if you agree with the statements presented below.

I agree that my child, \_\_\_\_\_, and I are voluntarily participating in a research study to be conducted by Bonnie Johnson, speech-language pathologist, as part of her doctoral studies at the Graduate Center of the City University of New York. I understand that I will be video and/or audiotaped with my child and that my child will be administered developmental intellectual and language testing which will be used for this research. I also understand that this material will be used to study developmental language interaction and play behaviors.

I grant permission for any experimental data to be used for scientific and educational purposes and I understand that my name and my child's name will not be used in any written or verbal presentations of this data.

I agree that no promises of therapeutic or other personal assistance have been made to me in connection with my participation in this study.

I am aware that I may discontinue participation in this study at any time, and that tapes made of myself and my child will be erased at my discretion.

\_\_\_\_\_  
Parent's signature

\_\_\_\_\_  
Date

APPENDIX B

TOY LIST

The following toys were available for the mother/adult and child to use during the 40 minute free play interaction period. Group 1, the core toys, were set up on the floor of the room before the interaction began. After a ten minute period the Group 2 toys were added, after another ten minutes Group 3 was added, and Group 4 was available for the last ten minute period.

Group 1 (Core toys)

Shopping cart  
Baby doll  
Baseball hat  
Coffee pot, cup, spoon, plate  
Blanket  
Wood train tracks and train  
Beads and string in container

Group 2

(These toys were presented in a cardboard box - if the child or adult did not take any of these toys out after five minutes, the experimenter took them out)

Farm set (barn, animals, people, farm equipment)  
Stacking barrels  
Ball  
Telephone (push button)  
Stuffed monkey

Group 3

Airplane with people and luggage next to it  
Pop beads  
Workbench with screwdriver, wrench, and hammer (one nut, screw and nail placed on the floor next to the bench, the rest of the pieces left in the bench)

Group 4

Dump truck, men, tools, blocks  
Girl and boy doll figures  
Baby bottle  
Brush and comb  
Chair  
Stacking rings

APPENDIX C

Table 5. Number of utterances (out of 200) in each of the response type categories in the speech of individual mothers (M) and strangers (S) for each group of children - specific language disordered (SLD), language-matched (LM), age-matched (AM).

Response Type Categories

<u>Subjects</u>	Semantic Extensions	Repetition/ Expansion	Response to Child Action	Adult Controlled	Ready Made	Within-Turn Extension	New Topic	Uncoded
	M/S	M/S	M/S	M/S	M/S	M/S	M/S	M/S
<u>Child</u>								
SLD-1	14/13	43/51	31/37	44/33	26/25	24/16	5/9	29/28
SLD-2	16/8	42/23	20/27	47/59	21/23	20/19	5/12	34/30
SLD-3	14/15	37/35	39/35	56/41	15/31	18/26	9/7	15/19
SLD-4	4/14	9/21	23/15	56/44	50/31	16/51	13/2	33/22
LM-1	8/9	47/23	33/43	57/47	28/32	16/35	4/4	16/14
LM-2	11/5	24/24	20/17	56/61	30/16	22/42	13/10	25/27
LM-3	9/3	30/10	21/46	52/61	19/23	43/30	4/5	22/23
LM-4	8/4	64/15	20/36	25/57	18/33	37/37	3/4	30/16
AM-1	38/64	17/10	22/16	17/24	39/36	30/36	12/5	32/12
AM-2	24/16	16/26	39/23	31/57	43/20	24/42	5/8	32/10
AM-3	27/30	23/25	15/23	41/41	46/30	28/39	6/4	17/9
AM-4	46/32	16/15	22/40	23/40	51/30	32/35	7/3	10/11

APPENDIX C (continued)

Table 6. Number of utterances (out of 200) in each of the function categories in the speech of individual mothers (M) and strangers (S) with children in each of the three groups - specific language disordered (SLD), language-matched (LM), age-matched (AM).

<u>Subjects</u>	<u>Function Categories</u>							
	Directives M/S	Assertives M/S	Questions - Test Knowledge M/S	Questions - Request Information M/S	Questions - Reflectives M/S	Acknowledgements M/S	Rejections M/S	Uncoded M/S
<u>Child</u>								
SLD-1	27/29	39/51	20/0	12/14	21/19	18/8	0/0	63/79
SLD-2	47/49	28/44	22/20	11/4	9/11	11/7	3/1	69/64
SLD-3	23/53	29/50	31/5	16/8	31/6	10/14	0/0	60/64
SLD-4	62/53	39/58	8/3	4/20	6/17	4/4	3/0	74/45
LM-1	35/35	33/67	4/1	17/10	19/25	20/10	1/0	71/52
LM-2	52/67	46/52	19/11	5/4	18/13	4/5	1/0	55/48
LM-3	59/44	46/60	14/14	11/11	16/18	5/8	0/0	49/45
LM-4	31/35	43/72	24/9	3/5	9/14	10/5	1/0	79/60
AM-1	48/19	58/88	6/0	14/31	9/9	12/15	0/0	53/38
AM-2	32/25	76/72	8/20	10/10	4/15	13/8	0/0	57/50
AM-3	22/19	59/82	5/10	20/12	20/19	27/17	0/0	47/41
AM-4	16/13	73/92	4/5	28/22	7/14	32/20	0/0	40/44

APPENDIX C (continued)

Table 7. Number of occurrences of each of the 'other conversational categories' in the speech of individual mothers (M) and strangers (S) with each child in the three groups - specific language disordered (SLD), language-matched (LM), and age-matched (AM).

Other conversational categories

<u>Subjects</u>	Self Repetitions	Continuing Utterances	Unrelated Utterances	Nonresponses
	M/S	M/S	M/S	M/S
<u>Child</u>				
SLD-1	14/17	38/32	34/14	96/12
SLD-2	11/4	51/59	6/11	21/0
SLD-3	25/9	34/49	4/4	16/45
SLD-4	26/24	64/99	39/6	7/10
LM-1	8/15	32/67	8/6	7/10
LM-2	28/22	62/95	14/30	1/4
LM-3	13/17	77/63	4/7	9/6
LM-4	26/23	70/80	1/1	2/10
AM-1	10/4	54/49	11/9	18/25
AM-2	7/2	56/66	1/6	29/1
AM-3	9/3	64/64	2/2	2/39
AM-4	7/6	35/51	4/4	25/20

BIBLIOGRAPHY

- Arthur, G. The Arthur Adaptation of the Leiter International Performance Scale. Washington D. C.: Psychological Service Center Press, 1952.
- Barnes, S., Gutfreund, M., Satterly, D. and Wells, G. Characteristics of adult speech which predict children's language development. Journal of Child Language, 1983, 10, 65-84.
- Bateson, M. C. Mother-infant exchanges: The epigenesis of conversational interaction. Annals of the New York Academy of Sciences, 1975, 263, 101-113.
- Baldwin, A. L. and Baldwin, C. P. The study of mother-child interaction. American Scientist, 1973, 61, 714-721.
- Bellinger, D. Consistency in the pattern of change in mothers' speech: Some discriminant analysis. Journal of Child Language, 1980, 7, 469-487.
- Benton, A. Developmental aphasia and brain damage. Cortex, 1976, 1, 40-52.
- Bingham, N. E. Maternal speech to pre-linguistic infants: Differences related to maternal judgements of infant language competence. Unpublished paper, Cornell University, 1971.
- Bloom, L. The magic of language development in the context of communication. In R. Golinkoff (ed.), The Transition from Communication to Language. Hillsdale, New Jersey: Lawrence Erlbaum Publishers, 1984.
- Bloom, L. and Lahey, M. Language Development and Language Disorders. New York: John Wiley and Sons, 1978.
- Bloom, L., Rocissano, L., and Hood, L. Adult-child discourse: Developmental interaction between linguistic processing and linguistic knowledge. Cognitive Psychology, 1976, 8, 521-552.
- Blount, B. G. Parental speech and language acquisition: Some Luo and Samoan examples. Anthropological Linguistics, 1972, 14, 119-130.
- Bondurant J., Romeo, D. and Kretschmer, R. Language behaviors of mothers of children with normal and delayed language development. Language, Speech and Hearing Services in the Schools, 1983, 14, 4, 233-242.
- Broen, P. The verbal environment of the language-learning child. ASHA Monograph, 17, 1972.

- Brown, R. W. A First Language: The Early Stages. Cambridge, Massachusetts: Harvard University Press, 1973.
- \_\_\_\_\_. Introduction. In C.E. Snow and C.A. Ferguson (ed.), Talking to Children: Language Input and Acquisition. New York: Cambridge University Press, 1977.
- Brown, R. W. and Bellugi, U. Three processes in the child's acquisition of syntax. Harvard Educational Review, 1964, 34, 133-151.
- Brown, R.W., Cazden, C.B. and Bellugi, U. The child's grammar from I to III. In J.P. Hill (ed.), Minnesota Symposium on Child Psychology, Vol. 2, Minneapolis: University of Minnesota Press, 1969.
- Buium, N. An investigation of the word order parameter of a parent-child verbal interaction in a relatively free order language. Language and Speech, 1974, 17, 182-186.
- Buium, N., Rynders, J. and Turnure, J. Early maternal linguistic environment of normal and Down's syndrome language-learning children. American Journal of Mental Deficiency, 1974, 79, 1, 52-58.
- Buss, D. Predicting parent-child interactions from children's activity level. Developmental Psychology, 1981, 1, 59-65.
- Bzoch, F. R. and League, R. Receptive-Expressive Emergent Language Scale for the Measurement of Language Skills in Infancy. Gainesville, Florida: Computer Management Corporation, 1970.
- Cazden, C.B. Environmental assistance to the child's acquisition of grammar. Unpublished doctoral dissertation, Harvard University, Cambridge, Massachusetts, 1965.
- \_\_\_\_\_. Child Language and Education. New York: Holt, Rinehart and Winston, 1972.
- Chapman, R. Mother-child interaction in the second year of life. In R. Schiefelbusch and D. Bricker (eds.), Early Language: Acquisition and Intervention. Baltimore: University Park Press, 1981.
- Cherry, L. and Lewis, M. Differential socialization of girls and boys: Implications for sex differences in language development. In N. Waterson and C. E. Snow (eds.), The Development of Communication. New York: John Wiley and Sons, 1978.

- Chomsky, N. Aspects of the Theory of Syntax. Cambridge, Massachusetts: MIT Press, 1965.
- Clarke-Stewart, K. A. Interactions between mothers and their young children: Characteristics and consequences. Monographs of the Society for Research in Child Development, 38, Chicago, Illinois: The University of Chicago Press, 1973.
- Clarke-Stewart, K. A., VanderStoep, L. P. and Killian, G. A. Analysis and replication of mother-child relations at two years of age. Child Development, 1979, 50, 777-793.
- Constable, K. and Lahey, M. Analyzing interactional episodes: Does the method make a difference? Paper presented at the Symposium on Research in Child Language Disorders, Madison, Wisconsin, June, 1984.
- Conti-Ramsden, G. and Friel-Patti, S. Mothers' discourse adjustments to language impaired and non-language-impaired children. Journal of Speech and Hearing Disorders, 1983, 48, 4, 360-367.
- Cramblit, N. S. and Siegel, G. M. The verbal environment of a language impaired child. Journal of Speech and Hearing Disorders, 1977, 42, 474-482.
- Cross, T. Mothers' speech adjustments: The contribution of selected child listener variables. In C.E. Snow and C. A. Ferguson (eds.), Talking to Children: Language Input and Acquisition. New York: Cambridge University Press, 1977.
- \_\_\_\_\_. Mothers' speech and its association with rate of linguistic development in young children. In N. Waterson and C.E. Snow (eds.), The Development of Communication. New York: John Wiley and Sons, 1978.
- \_\_\_\_\_. Habilitating the language impaired child: Ideas from studies of parent-child interaction. Topics in Language Disorders, 1984, 4, 4, 1-14.
- Cunningham, C. E., Reuler, E., Blackwell, J. and Deck, J. Behavioral and linguistic developments in the interactions of normal and retarded children with their mothers. Child Development, 1981, 52, 62-70.
- Depaulo, B. M. and Bonvillian, J. D. The effect on language development of the special characteristics of speech addressed to children. Journal of Psycholinguistic Research, 1978, 7, 3, 189-211.

- deVilliers, J.G. and deVilliers, P. A. A cross-sectional study of the acquisition of grammatical morphemes in child speech. Journal of Psycholinguistic Research, 1973, 2, 267-278.
- 
- . Semantics and syntax in the first two years. In F. D. Minifie and L. L. Lloyd (eds.), Communicative and Cognitive Abilities - Early Behavioral Assessment. Baltimore: University Park Press, 1978.
- Donahue, M. and Pearl, R. Conversational interactions of mothers and their preschool children who had been at perinatal risk. Paper presented at the Symposium for Research in Child Language Disorders, Madison, Wisconsin, June, 1984.
- Dore, J., Gearhart, M. and Newman, D. The structure of nursery school conversations. In K. Nelson (ed.), Children's Language, Volume 1. New York: Gardner Press, 1978.
- Ervin-Tripp, S. and Miller, W. Early discourse: Some questions about questions. In M. Lewis and L. Rosenbloom (eds.), Interaction, Conversation and the Development of Language. New York: John Wiley and Sons, 1977.
- Fodor, J. S. How to learn to talk: Some simple ways. In F. Smith and G.A. Miller (eds.), The Genesis of Language: A Psycholinguistic Approach. Cambridge, Massachusetts: MIT Press, 1966.
- Frank, S. M., Allen, D., Stein, L. and Myers, B. Linguistic performance in vulnerable and autistic children and their mothers. American Journal of Psychiatry, 1976, 133, 8, 909-915.
- Fraser, C. and Roberts, N. Mothers' speech to children at different ages. Journal of Psycholinguistic Research, 1975, 4, 9-16.
- Furrow, D., Nelson, K. and Benedict, H. Mothers' speech to children and syntactic development: Some simple relationships. Journal of Child Language, 1979, 6, 423-442.
- Garnica, O.K. Some prosodic and paralinguistic features of speech to young children. In C.E. Snow and C.A. Ferguson (eds.), Talking to Children: Language Input and Acquisition. New York: Cambridge University Press, 1977.

- Gelman, R. and Shatz, M. Appropriate speech adjustments: The operation of conversational constraints on talk to two-year-olds. In M. Lewis and L. Rosenblum (eds.), Interaction, Conversation, and the Development of Language. New York: John Wiley and Sons, 1977.
- Gleason, J.B. Talking to children: some notes on feedback. In C.E. Snow and C.A. Ferguson (eds.), Talking to Children: Language Input and Acquisition. New York: Cambridge University Press, 1977.
- Gleason, J.B. and Weintraub, S. Input language and acquisition of communicative. In K. Nelson (ed.), Children's Language: Volume 1. New York: Gardner Press, 1978.
- Goldfarb, W., Goldfarb, N. and Scholl, H.H. The speech of mothers of schizophrenic children. American Journal of Psychiatry, 1966, 122, 1220-1227.
- Goldfarb, W., Levy, D. and Meyers, D. The mother speaks to her schizophrenic child: Language in childhood schizophrenia. Psychiatry, 1972, 35, 217-226.
- Gutman, A.J. and Rondal, J.A. Verbal operants in mothers' speech to nonretarded and Down's syndrome children matched for linguistic level. American Journal of Mental Deficiency, 1979, 83, 5, 446-452.
- Holzman, M. The use of interrogative forms in verbal interaction of three mothers and their children. Journal of Psycholinguistic Research, 1972, 1, 311-336.
- Jones, O.H.M. Mother-child communication with pre-linguistic Down's syndrome and normal infants. In H.R. Schaffer (ed.), Studies in Mother-Infant Interaction. New York: Academic Press, 1977.
- Kaye, K. Thickening thin data: The maternal role in developing communication and language. In M. Bullowa (ed.), Before Speech. New York: Cambridge University Press, 1979.
- Kaye, K. and Charney, R. Conversational asymmetry between mothers and children. Journal of Child Language, 1981, 8, 35-49.
- Keenan, E. O. Conversational competence in children. Journal of Child Language, 1974, 2, 163-183.
- Lasky, E.Z. and Klopp, K. Parent-child interactions in normal and language disordered children. Journal of Speech and Hearing Disorders, 1982, 47, 7-18.

- Leonard, L. Language impairment in children. Merril-Palmer Quarterly, 1979, 25, 3, 205-232.
- Levinson, J.F. The relationship between child utterances and parent responses. Unpublished doctoral dissertation, Columbia University, New York, 1979.
- Lieven, E.V.M. Turn-taking and pragmatics: Two issues in early child language. In R.N. Campbell and P.T. Smith (eds.), Recent Advances in the Psychology of Language. New York: Plenum Press, 1978a.
- \_\_\_\_\_. Conversations between mothers and young children: Individual differences and their possible implications for the study of language learning. In N. Waterson and C.E. Snow (eds.), The Development of Communication. New York: John Wiley and Sons, 1978b.
- \_\_\_\_\_. Interactional style and children's language learning. Topics in Language Disorders, 1984, 4, 4, 15-23.
- McCarthy, D. McCarthy Scales of Children's Abilities. New York: The Psychological Corporation, 1972.
- McDonald, L. and Pien, D. Structure among mother conversational behaviors. Journal of Child Language, 1981, 9, 337-358.
- MacNamara, J. Cognitive basis of language learning in infants. Psychological Review, 1972, 79, 1-13.
- McNeill, D. Developmental psycholinguistics. In F. Smith and G. Miller (eds.), The Genesis of Language. Cambridge, Massachusetts: The MIT Press, 1966.
- MacPherson, C.A. and Weber-Olsen, M. Mother speech input to deficient and language normal children. Proceedings from the First Wisconsin Symposium on Research in Child Language Disorders, 1980, 1, 59-79.
- Marshall, N., Hegrenes, J. and Goldstein, S. Verbal interactions: Mothers and their retarded children vs. mothers and their nonretarded children. American Journal of Mental Deficiency, 1973, 77, 4, 415-419.
- Martlew, M. Mothers' control strategies in dyadic mother/child conversations. Journal of Psycholinguistic Research, 1980, 9, 4, 327-347.
- Miller, J.F. Assessing Language Production in Children: Experimental Procedures. Baltimore, Maryland: University Park Press, 1981.

- Moerk, E. Principles of interaction in language learning. Merrill-Palmer Quarterly, 1972, 18, 229-257.
- \_\_\_\_\_. Changes in verbal child-mother interactions with increasing language skills of children. Journal of Psycholinguistic Research, 1974, 3, 101-116.
- \_\_\_\_\_. Relationships between parent input frequencies and children's language acquisition: A reanalysis of Brown's data. Journal of Child Language, 1980, 7, 105-118.
- Morehead, D.M. and Ingram, D. The development of base syntax in normal and linguistically deviant children. Journal of Speech and Hearing Research, 1973, 16, 330-352.
- Nelson, K. Structure and strategy in learning to talk. Monographs of the Society for Research in Child Development, 38, 1973.
- \_\_\_\_\_. Early speech in its communicative context. In F.D. Minifie and L.L. Lloyd (eds.), Communicative and Cognitive Abilities - Early Behavioral Assessment. Baltimore: University Park Press, 1978.
- Nelson, K., Carskaddon, G. and Bonvillian, J. Syntax acquisition: Impact of experimental variation on adult verbal interaction with the child. Child Development, 1973, 44, 497-504.
- Newcomer, P.P. and Hamill, D.D. Test of Oral Language Development. New York: Slosson Educational Publishers Corporation, 1980.
- Newhoff, M. and Millet, A. Language disordered children: Language disordered mothers? Paper presented to the American Speech and Hearing Association, San Francisco, 1978.
- Newhoff, M., Silverman, L. and Millet, A. Linguistic differences in parents speech to normal and language disordered children. Paper presented to the Symposium on Research in Child Language Disorders, University of Wisconsin - Madison, 1980.
- Newport, E.L. Motherese: The speech of mothers to young children. In N.J. Castellan, D.B. Pisoni and G.R. Potts (eds.), Cognitive Theory: Volume 2. Hillsdale, New Jersey: Lawrence Erlbaum Associates, 1976.

- Newport, E., Gleitman, H. and Gleitman, L. Mother, I'd rather do it myself: Some effects and noneffects of maternal speech style. In C.E. Snow and C.A. Ferguson (eds.), Talking to Children: Language Input and Acquisition. New York: Cambridge University Press, 1977.
- Olsen-Fulero, L. Style and stability in mother conversational behaviour: A study of individual differences. Journal of Child Language, 1982, 9, 543-564.
- Petersen, G. and Sherrod, K. Relationship of maternal language to language development and language delay of children. American Journal of Mental Deficiency, 1982, 86, 4, 391-398.
- Phillips, J. Syntax and vocabulary of mothers speech to young children: Age and sex comparisons. Child Development, 1973, 44, 182-185.
- Ramey, C.T., Farran, D.C., Campbell, F.A. and Findelstein, N.W. Observations of mother-infant interactions: Implications for development. In F.D. Minifie and L.L. Lloyd (eds.), Communicative and Cognitive Abilities - Early Behavioral Assessment. Baltimore, Maryland: University Park Press, 1978.
- Remick, H. Maternal speech to children during language acquisition. ERIC, ED 072 863, 1973.
- Retherford, K. S., Schwartz, B. C. and Chapman, R. S. Semantic roles and residual grammatical categories in mother and child speech: Who tunes into whom? Journal of Child Language, 1982, 8, 583-608.
- Rondal, J.A. Maternal speech to normal and Down's syndrome children matched for mean length of utterance. In C.E. Meyers (ed.), Quality of Life in Severely and Profoundly Mentally Retarded People: Research Foundations for Improvement, Washington D.C.: American Association on Mental Deficiency, 1978, 3, 193-265.
- Schaffer, H.R., Collis, G.M. and Parsons, G. Vocal interchange and visual regard in verbal and pre-verbal children. In H.R. Schaffer (ed.), Studies on Mother-Infant Interaction. New York: Academic Press, 1977.
- Schaffer, H.R., Hepburn, A. and Collis, G.M. Verbal and nonverbal aspects of mothers' directives. Journal of Child Language, 1983, 10, 337-355.

Scherer, N.J. and Coggins, T.E. Responses to requests in the dialogues of mothers and their Stage I children. Journal of Speech and Hearing Research, 1982, 25, 58-64.

Schiff, N. The influence of deviant maternal input on the development of language during the preschool years. Journal of Speech and Hearing Research, 1979, 22, 3, 581-603.

Schneiderman, M. Do what I mean, not what I say: Changes in mothers' action directives to young children. Journal of Child Language, 1983, 10, 357-367.

Shatz, M. How to do things by asking: Form-function pairings in mothers' questions and their relation to children's responses. Child Development, 1979, 50, 1093-1099.

\_\_\_\_\_. Learning the rules of the game: Four views of the relation between social interaction and syntax acquisition. In Deutsch (ed.), The Child's Construction of Language. London: Academic Press, 1982.

Shatz, M. and Gelman, R. The development of communication skills: Modifications in the speech of young children as a function of the listener. Monograph of the Society for Research in Child Development, 38, 1973.

\_\_\_\_\_. Beyond syntax: The influence of conversational constraints on speech modifications. In C.E. Snow and C.A. Ferguson, Talking to Children: Language Input and Acquisition. New York: Cambridge University Press, 1977.

Shipley, E.S., Smith, C.S. and Gleitman, L.R. A study in the acquisition of language: Free responses to commands. Language, 1969, 45, 322-342.

Siegel, G. Adult verbal behavior in "play therapy" sessions with retarded children. Journal of Speech and Hearing Disorders Monograph, 1963a, 10, 34-38.

\_\_\_\_\_. Verbal behavior in "play therapy" sessions with retarded children. Journal of Speech and Hearing Disorders Monograph, 1963b, 10, 47-53.

\_\_\_\_\_. Adult verbal behavior with retarded children labelled as "high" or "low" in verbal ability. American Journal of Mental Deficiency, 1963c, 3, 417-424.

Siegel, G. and Harkins, J. Verbal behavior of adults in two conditions with institutionalized retarded children. Journal of Speech and Hearing Disorders Monograph, 1963, 10, 39-46.

Siegel, L., Cunningham, C. and VanderSpuy, H. Interaction of language delayed and normal preschool children with their mothers. Paper presented to the Society for Research in Child Development, 1979.

Silverman, L., and Newhoff, M. Fathers' speech to normal and language delayed children: A comparison. Paper presented to the American Speech and Hearing Association, Atlanta, 1979.

Skinner, B.J. Verbal Behavior. New York: Appleton-Century-Crofts, 1957.

Slobin, D.I. Cognitive prerequisites for the development of grammar. In C.A. Ferguson and D. Slobin (eds.), Studies in Child Language Development. New York: Holt, Rinehart, and Winston, 1973.

Smolak, M. and Weintraub, M. Maternal speech: Strategy or response? Journal of Child Language, 1983, 10, 369-380.

Snow, C.E. Mothers' speech to children learning language. Child Development, 1972, 43, 549-565.

\_\_\_\_\_. Mothers' speech research: An overview. Paper presented at the Conference on Language Input and Acquisition, Boston, September, 1974.

\_\_\_\_\_. The development of conversation between mothers and babies. Journal of Child Language, 1977, 4, 1-22.

\_\_\_\_\_. The conversational context of language acquisition. In R.N. Campbell and P.T. Smith (eds), Recent Advances in the Psychology of Language. New York: Plenum Press, 1978.

Spradlin, J. and Rosenberg, S. Complexity of adult verbal behavior in a dyadic situation with retarded children. Journal of Abnormal and Social Psychology, 1964, 68, 694-698.

Stark, R. and Tallal, P. Selection of children with specific language deficits. Journal of Speech and Hearing Disorders, 1981, 46, 2, 1981.

Stern, K., Jaffe, J., Beebe, B. and Bennett, S.L. Vocalizing in unison and alternation: Two modes of communication within the mother-infant dyad. Annals of the New York Academy of Sciences, 1975, 263, 89-100.

Templin, M. Certain Language Skills in Children. Minneapolis: University of Minnesota Press, 1957.

- Tiegerman, E. and Siperstein, M. Individual patterns of interaction in the mother-child dyad: Implications for parent intervention. Topics in Language Disorders, 1984, 4, 4, 50-61.
- Tulkin, S.R., and Kagan, J. Mother-child interaction in the first year of life. Child Development, 1972, 43, 31-41.
- Van Kleeck, A. and Carpenter, R.L. The effects of children's language comprehension level on adults' child-directed talk. Journal of Speech and Hearing Research, 1980, 23, 3, 546-569.
- Vorster, J. Mommy linguist: The case for motherese. Lingua, 1975, 39, 202-212.
- Weiner, P. A language delayed child at adolescence. Journal of Speech and Hearing Disorders, 1974, 39, 202-212.
- Wells, G. Learning to code experience through language. Journal of Child Language, 1974, 1, 243-269.
- \_\_\_\_\_. Apprenticeship in meaning. In K. Nelson (ed.), Children's Language: Volume 2. New York: Gardner Press, 1980a.
- \_\_\_\_\_. Adjustments in adult-child conversation: Some effects of interaction. In H. Giles, W.P. Robinson and P.M. Smith (eds), Language: Social Psychological Perspectives. Oxford: Pergamon, 1980b.
- White, S.J. and White, R.E.C. The deaf imperative: Characteristics of maternal input to hearing impaired children. Topics in Language Disorders, 1984, 4, 4, 38-49.
- Whitehurst, G.J., Ironsmith, E.M. and Goldfein, M.R. Selective imitation of the passive construction through modelling. Journal of Experimental Child Psychology, 1974, 17, 288-302.
- Wulbert, M., Inglis, S., Kriegsmann, E., and Mills, B. Language delay and associated mother-child interactions. Developmental Psychology, 1975, 11, 1, 61-70.