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A Comparison of Communication Intentions in Toddlers Between Sixteen and Thirty-Four Months of Age

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Research into the development of intentional communication in very young children has centered on the description of the communicative abilities of normally developing children. Such research has identified a group of communication functions or intentions which are commonly acquired in the first two years of life. A progression from non-verbal communication to entry into the adult language system has been noted in normal children. Little research, however, has been conducted to identify the characteristics

and communicative abilities of expressive language delayed (ELD) children or to understand the movement of these children along the developmental continuum of intentional communication acquisition.

The purpose of this study was to compare the frequency and range of communication intentions in normally developing toddlers and ELD toddlers. Data were gathered from ten minute video tapes of low structured parent/child interaction by coding twelve communication intentions commonly acquired in the first two years of life and expressed with five modes of communication.

Twenty-eight normally developing toddlers and twenty-eight ELD toddlers from the Portland Metropolitan area were chosen for the study. Subjects ranged in age from sixteen to thirty-four months and were matched from mean age, sex, and socio-economic status. All subjects passed a screening for hearing acuity and score of at least 85 on the Bayley Scales of Infant Development.

Data were analyzed for significant differences between the two groups in the number of different intentions expressed and the frequency of expression. Results from the ELD group were further analyzed for distinctive sub-group profiles. Results indicated that there was no difference between the normal and ELD subjects in the number of different intention types expressed. The normal group used more intentions overall than the ELD group.

Both groups used the category of joint attention, specifically commenting, more frequently than the other types of intentions. It was also found that the normally developing subjects showed a significant preference for verbal forms of communication, in particular, word combination. The ELD group, however, demonstrated a significant preference for non-verbal communication, particularly vocalization.

ELD subjects were placed into four sub-groups based on the number of different intention types expressed and the total frequency of intentions. Comparisons of groups were made to identify possible communication profiles. Comparisons indicated that although some ELD children appeared to resemble the normally developing group, these delayed children were significantly older than the normal children and they were significantly less verbal, as demonstrated in the use of the single word and word combination modes.

In conclusion, the ELD group appeared to be less sophisticated in their abilities to express communication intentions than the normally developing group, even though the ELD toddlers were capable of expressing the same range of different intention types. The difference between the two groups was determined to be based on the quantity of expression and the mode of expression.

A COMPARISON OF COMMUNICATION INTENTIONS IN TODDLERS BETWEEN SIXTEEN AND THIRTY-FOUR MONTHS OF AGE

by

MARY ELAINE SHIFFER

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TABLE OF CONTENTS

LIST OF TABLES

TABLE PAGE

CHAPTER I

INTRODUCTION AND STATEMENT OF PURPOSE

INTRODUCTION

The main body of literature concerning intentional communication in young children deals with those children who are developing expressive language normally. The pattern in which delayed children acquire either communication or expressive language has not been thoroughly researched. Differentiation of very young children who are truly delayed in expressive language from those who will eventually develop normal expressive language, the "late bloomers," is a matter of particular interest. It holds implications for both diagnosis and remediation of expressive language delays. Currently, few assessment instruments are available for use with very young children suspected to have an expressive language delay. Making this distinction early allows for early intervention. The benefits of early intervention to child and the family could be to lessen or even eliminate the effects of poor communication skills on peer and family relationships as well as on school achievement.

Development of a communication profile may provide new information not available from current language

sampling techniques and standardized testing procedures about the effectiveness of the child's speech within his environment, and the functional tools he has available to express himself. It is possible that distinctive profiles may exist that could be used to identify the chronically expressive language delayed child from the normal "late bloomer." Such profiles may also be of value in remediation planning and parent counseling.

STATEMENT OF PURPOSE

It is the purpose of this study to compare the frequency and range of communication intentions in children between sixteen and thirty-four months with expressive language delay (ELD) with those of their normal age mates. Two questions forming the basis of this study are stated as the following null hypotheses.

A. There is no significant difference in the number of different communication intentions expressed by normally developing and ELD toddlers.

B. There is no significant difference in the frequency of communication intentions expressed by normally developing and ELD toddlers.

In addition to these hypotheses the following questions associated with the hypotheses were addressed within this study.

1. Are there differences in the expression of communications intentions within the delayed group that identify children as belonging to a sub-group?
   a. Is there a sub-group which expresses a limited variety of intentions types, and fewer intentions overall than the normal group?
   b. Is there a sub-group that expresses a broad variety of intentions, but with less frequency than the normal group?
   c. Is there a sub-group that expresses a limited variety of intentions but uses this limited variety of intentions with normal frequency?
   d. Is there a sub-group that looks normal in terms of communication, but is delayed only in terms of expressive langauge?
2. Do the normally developing subjects convey communicative intentions using different forms of expression from the ELD's?

DEFINITION OF TERMS

The following operational definitions were utilized within this study.

1. Acknowledgement. Intentional communicative behavior directed to the parent for the purpose of indicating that a message from a previous remark or action has been received (Wetherby, Cain, Yonclas, and Walker, in press).

2. Calling. Intentional communicative behavior directed to the parent to gain their attention (Wetherby et al., in press).

3. Comment. Remarks made by the child describing or calling attention to some aspect of his environment, experiences past, present or future, or other persons known to the child (Coggins and Carpenter, 1981; Dale, 1978).

4. Communication Intention. The purposeful sending of a signal, verbal or non-verbal, for which the sender has an awareness of the effect of that signal on the receiver. For the purpose of this study these intentions are grouped into three categories: regulatory, social interaction, and joint attention.

5. Gesture. A mode of expressing intentional behavior to convey a message. Gestures include head nods, pointing, foot stomping, pushing away, touching purposefully, handing an item to the parent.

6. Gesture with Vocalization. Intentional behavior in which gesture and vocalization, as defined herein, are present simultaneously.

7. Greeting. Intentional communicative behaviors directed to the parent for the purpose of beginning or ending social interaction (Wetherby et al., in press).

8. Joint Attention Intentions. Those communications behaviors in which the child and the listener engage in mutual attention to the same object, person or event. These intentions include comments, requests for information and requests for clarification.

9. Mode of Communication. The manner or form in which the child expresses a communicative intention, for example with gesture, vocalization, gesture plus vocalization, single word, and word combination.

10. Single or One Word Mode. Intentional behavior in which the child uses single, intelligible, conventional words.

11. Protest. Intentional behavior directed to parent to refuse an object, action or direction (Wetherby et al., in press).

12. Regulatory Intentions. Those communication behaviors that have the goal of regulating the behavior of the listener. This category includes requests for actions, requests for objects and protests.

13. Request For Action. Intentional communicative behavior directed to the interlocutor asking for the performance of an action. The child may ask the parent to intervene using any of the five modes of communication, but

there must be a child initiated petition for intervention, not simply struggle, followed by the parent offering to help or do the action (Coggins and Carpenter, 1981).

14. Request For Clarification. Intentional communicative behavior directed to the interlocutor in which the child asks for additional information or repetition of the previous adult statement (Wetherby et al., in press).

15. Request For Information. Intentional communicative behavior directed to the interlocutor asking for information, explanation about persons, places, things, actions, etc. This intention will be almost exclusively expressed in the one word and word combination modes (Wetherby et al., in press).

16. Request For Object. Intentional communicative behavior directed to the interlocutor asking for an object which is usually out of reach. The child may use any of the five modes of communication to express the request (Paul, 1987).

17. Request For Permission. Intentional communicative behavior directed to the interlocutor asking for approval to do some action (Wetherby et al., in press).

18. Request for Social Routine. Intentional communicative behavior directed to the interlocutor for the purpose of engaging in simple interactional routines such as patty cake, itsy bitsy spider, peek-a-boo, etc. (Wetherby et al., in press).

19. Showing Off. Intentional communicative behavior directed to the parent in which the child attempts to get the parent's attention by calling attention to himself (Wetherby et al., in press).

20. Social Interaction Intentions. Those communication behaviors that have as their goal greetings, maintaining attention through showing off, calling to the listener, request for social routine, request for permission and acknowledgement of reception of a message.

21. Expressive Language Delay (ELD). Children who demonstrate a limited expressive vocabulary based on parent report and meeting the following criteria:

A. 15 to 17 months of age and producing less than five words.

B. 18 to 23 months of age and producing less than ten words.

C. 24 to 34 months of age and producing less than fifty words or using no two word combinations.

22. Verbalization. Intentional behavior directed to a listener and used to convey a message with intelligible, conventional words.

23. Vocalization. Intentional behavior used to convey a message in the form of phonetically consistent, word-like forms or sounds that are not intelligible, conventional words.

24. Word Combination. Intentional behavior used to convey a message in the form of two or more intelligible, conventional words.

CHAPTER II

REVIEW OF THE LITERATURE

Normal Development of Communications Intentions

Prior to the child's first word, he has a considerable history of communicative behavior. Mother and child have been involved in predictable interactions without words but with shared meaning and development of intentionality. The infant may express himself by gazing from adult to object, reaching, pointing, protesting with gestures and/or vocalizations, opening and closing the hand or touching the adult. These behaviors evolve over the first year of life, culminating in true intentional behavior at nine to ten months of age when the child is aware that the adult can be used as an agent, and that his action can bring the adult to action (Bates, Camaioni & Volterra, 1975).

Bates et al. (1975) and Bates (1976) describe three stages of communication development in the infant and young child, the perlocutionary, illocutionary, and locutionary. The infant in the perlocutionary stage, birth to nine or ten months of age, is not communicating intentionally, but his actions and sounds are interpreted as intentional by his parents. His cries, vegetative sounds and reflexive

movements cause a response from his parents, however, he does not plan these actions or realize that adults can attach meaning to them (Bates, 1976).

The illocutionary stage is marked by an understanding on the part of the infant that the listener is receiving the message, and an understanding on the part of the listener that the message is intentional (Bates, (1976). Some theorists have proposed that in order for this level of communication to occur, the child must be able to recognize cause and effect relationships. Therefore, in order to achieve the illocutionary stage, the child must have achieved a certain stage of cognitive development, in particular Piaget's Sensorimotor Stage 5, usually achieved at about ten months of age (Bates, 1976). Piaget proposes that the infant is not capable of intentionally using an adult to intervene for him until Sensorimotor Stage 5 (Bates, 1976). Miller, Chapman, Branston and Reiche (1980), however, present evidence which disputes the necessity of this relationship between cognition and language. Nonetheless, illocutionary behavior generally emerges at about eight to twelve months of age.

The third stage of Bates' description of communication development is the locutionary stage. This stage is marked by the use of words in a referential manner. A locutionary speech act is the uttering of sounds in words (Bates et al., 1975: Bates, 1976). Bates et al. (1975)

reported the two children in their study reached this point at twelve and fifteen months of age when they were in Piaget's Sensorimotor Stage 6. Children use speech first to express intentions they have previously expressed non-verbally through gesture and vocalization, making a gradual transition from non-verbal to verbal communication (Bates, 1976).

In young children, communication intentions, as part of the pragmatic realm of language, encompass the manner in which children use their emerging communication skills to express their wants and dislikes, comment on experiences and what they see, and give responses to people and the environment. Various definitions and organizational bases for description of communication intentions in both prelinguistic and linguistic children have been proposed by several researchers. Chapman (1981) points out that the communicative intent of an utterance may be analyzed from many perspectives.

Bruner (1983) states that there are three basic aspects to language acquisition which enable children to be proficient in their native tongue. These aspects of language involve putting a message together in conformity with grammatical rules, (syntax), construction of meaning and reference, (semantics), and getting things done effectively through language, (pragmatics). The third aspect may be referred to as the function of language or

communication intent. These individual aspects of language do not develop independently, but rather are interdependent and related to each other.

Halliday (1975) named three phases of communicative development in children. The first phase begins at approximately ten months of age and is a period in which children begin to develop what Halliday referred to as "a functional linguistic system." He developed a theory as to the functions which a child could employ during this first phase of development. These functions are described as follows: 1. The instrumental function in which the child communicates what he wants. 2. The regulatory function in which the child conveys the message to do something for him. 3. The interactional function in which the child establishes give and take and maintains contact with people. 4. The personal function in which the child demonstrates his uniqueness and individuality. 5. The heuristic function in which the child explores his world as separate from himself. 6. The imaginative function in which the child creates an environment (Halliday, 1975).

Phase II consists of the transition period from the "functional linguistic system" of Phase I to the adult language system and begins at around eighteen months of age. It is characterized by rapid acquisition of vocabulary and grammar approaching that of the adult system, and by use of dialogue. During this phase children are using

the mathetic function, using language to learn about the world. They demonstrate this function through commenting and narrating (Halliday, 1975).

Phase III is the period of learning the adult language system. Children's language at this point becomes flexible and expresses ideas and interpersonal functions. At this phase, around three years of age, language has come to be the center of learning experiences (Halliday, 1975).

Dore (1974) labeled early intentional communication as primitive speech acts. Arwood (1983) commented that these acts are not found in adult or older children's speech. The primitive speech acts which Dore identified were labeling, repeating, answering, requesting an action, requesting an answer, calling, greeting, protesting and practicing (Dore, 1974).

Dore studied the communicative behavior of two children, a boy and a girl, over a period of time beginning at fifteen months of age. His purpose was to define the process by which children acquired speech acts in their native language. Videotapes were made every two weeks until the children reached the stage in language development of spontaneous two word production. Dore concluded that the children differed in style of communication. One child was prone to making declarative remarks about the environment. The other child used language to manipulate or regulate people. As a result of this finding, he termed

the children "code-oriented" and "message-oriented" respectively (Dore, 1974).

Harding and Golinkoff (1979) conducted a study to examine the development of intentional communication in prelinguistic infants. Forty-six first born infants, 8 to 15.3 months and divided into groups based on sensorimotor stage, were videotaped with the mother for one hour. Infants were presented with frustration episodes to elicit intentionally communicative behaviors. Piagetian tasks were conducted to assess the infants' object concept and causal development levels.

The data reported showed that intentional vocalizations were significantly related to the child's level of causal development. All infants using vocalizations reached Sensorimotor Stage 5 of causality development, and none were in Stage 4. Perlocutionary infants seldom directed vocalizations to their mothers. They appeared to be unaware that their mothers could act as an agent in obtaining objects. Illocutionary infants used directed vocalizations toward their mothers. Hardy and Golinkoff state that the results may be affected by mother-child interaction styles already well established prior to testing and may be a function of that relationship as well as of the cognitive level (Harding & Golinkoff, 1979).

Bates et al. (1975) followed the communication development of three Italian children of different ages

ranging from two to twelve months. The researchers concluded that prior to around ten months, the age that corresponds to Piaget's Sensorimotor Stage 5, the children were not capable of intentional use of imperative or declarative behaviors. Bates and associates found that Stage 5 correlated with the development of performatives with illocutionary force. At this stage the children were capable of determining that others could serve as agents of actions. They assigned locutionary development, manifested by referential use of words, to Stage 6. Behaviors in Stage 6, such as symbolic play and referential use of language, appear to emerge almost simultaneously. The research also found individual differences in the timetable of acquisition of sensorimotor stage behaviors and intentionally communicative behaviors.

The exact role of cognition in the development of intentional communication is not proven. Strong emphasis has been placed on the attainment of a minimum level of cognitive development for the emergence of intention, indicating that intentional communication follows cognition, but questions regarding this position have been raised. Miller et al. (1980) examined the relationship between language comprehension and sensorimotor stage development in a cross-sectional study of forty-eight ten to twenty-one month old children. Results showed that age was a better predictor of comprehension than sensorimotor

stage assignment. Miller et al. concluded that Stage 6 functioning is not required for comprehension of the one or two word semantic roles tested in their study.

Bruner (1975) proposed that the examination of how langauge is used is essential to understanding the manner of language acquisition. He further stated that a relationship between the grammatical structure and the illocutionary function of language exists, and this relationship is essential for the acquisition of language. This interplay between structure and function aids children in their relatively rapid entry into their native language.

A recent study conducted by Wetherby, Cain, Yonclas and Walker (in press), examined the use of intentional communication in normally developing children from the prelinguistic to the multi-word stage of development using both elicitation tasks and a low structured interaction. The two procedures consisted of a total of thirty minutes of observation, all of which were videotaped. Fifteen children between the ages of eleven and fourteen months were observed four times in a twelve month period, twice during the prelinguistic period and once each during the one word and multi-word phases. Results indicated that the most frequently used specific intention employed by children at all three developmental stages was commenting, while the second most frequently used intention was request for action (Wetherby et al., in press).

In addition to examining the intentions expressed by their subjects, Wetherby et al. also studied the mode of communication expression. They found that the children in the multi-word stage predominantly used verbal means of expression, whereas in the prelinguistic phase, the majority used a combination of vocalization and gestures most frequently (Wetherby et al., in press).

In summary, children progress in development of intentionality throughout infancy and early childhood. This development is manifest through expression of communication functions which appear to progress along a developmental continuum. Children express these functions first non-verbally and then verbally. This progression may follow the development of cognition as defined by Piaget and proposed by Bates, although this is not completely accepted by all researchers. The importance of functions in the normal acquisition of language is presented by Bruner. His contention that communication functions play an important role in the normal acquisition of language provides a rationale for investigation of communicative function in expressively delayed children.

Methods of Assessment of Intentional Communication

Two methods of assessment of communication intentions in young children are proposed in the literature. The first consists of observation of free play or low struc-

tured sessions, and the second uses elicitation tasks. Coggins, Olswang and Guthrie (1987) conducted a fifteen month longitudinal study of low structured observation versus elicited tasks in thirty-five normally developing children. The age of the children at the beginning of the study was nine months plus or minus one week. The children were videotaped at three month intervals while engaging in a play situation and in a set of elicitation tasks. Results were mixed in that low structured observation was more effective at assessing comments at younger ages. Elicitation tasks more effectively assessed requests at both younger and older ages. Coggins et al. concluded that no one system of sampling is likely to provide an accurate representation of the young child's intentional communication in the clinical setting. It was suggested that clinicians need to be flexible in their approach to assessment of young children.

Coggins and Carpenter (1981) designed the Communicative Intent Inventory to describe intentional communication in children operating within Piaget's Sensorimotor Stages 4 through 6. The functions included in this coding procedure are normally acquired by the child's second birthday and include comment on action, comment on object, request for action, request for object, protesting, request for information, answering and acknowledgement. Three forms of communication are coded, gesture, gesture with vocalization

and verbalization. The authors proposed that this procedure may be used for both non-verbal cognitively delayed children and non-verbal, non-cognitively delayed children.

Coggins and Carpenter (1981) stated that there were flaws in the inventories of communication intentions developed prior to theirs. These flaws consisted of a lack of operational definitions of the inventory categories, too few categories and/or a lack of information on reliability. Two examples of inventories not meeting criteria set by Coggins and Carpenter are those inventories by Dore and Halliday. Dore (1974) employed a system that evaluated nine speech acts, but the study on which he based his data concerning primitive speech acts involved only two children. Halliday (1977) based his descriptions of phases of communications and function on extensive observations of only one child in the early stages of language acquisition. Coggins and Carpenter (1981) provided operational definitions of their inventory as well as reliability information, explanations of content validity, and a range of age appropriate functions.

Dale (1978) examined the pragmatic communication development in twenty children ranging in age from 1.0 years to 2.0 ages at three month intervals to test the reliability and feasibility of pragmatic assessment. The children were assessed during a structured play session designed to elicit declarative and imperative responses,

and during a spontaneous language sampling, both of which were videotaped. Dale identified fourteen pragmatic functions and six manners in which the functions may be expressed. These manners of expression described the relationship of the children's utterances to the adult dialogue partner by reporting the spontaneity or degree of imitation employed. Dale concluded that it was possible to assess pragmatic functions reliably on the basis of a thirty minute observation in an unfamiliar setting. He further stated that pragmatic assessment provided information about language development not provided by syntactic analysis such as mean length of utterance (Dale, 1978).

Casby and Cumpata (1986) designed a protocol to determine if children used illocutionary force, and in which mode they did so, gesture, vocal, verbal or conventional words. Twenty elicitation tasks in declarative and imperative behaviors were rated on an ordinal scale. A study of eleven language impaired children between 1.6 years and 3.3 years were evaluated by two judges using the twenty tasks. Results indicated that procedures for the elicitation of intentional communication can be reliably used. Between the two types of tasks, the imperative tasks were more reliable and more effective in determining the presence of intentional communication than the declarative tasks.

Paul (1987) proposed a procedure to assess communication functions in children beginning at Piaget's Sensorimotor Stage 4. The coding procedure is based on Coggins and Carpenter (1981) and covers a set of seven functions, request for object, request for action, protest, comment, answering, acknowledging and request for information. These functions may be expressed in three forms of communication, gesture, vocalization and word. Although this is not a complete list of the range of communicative functions children of this age can express, Paul proposes that it is a practical and manageable protocol for clinical assessment in a short fifteen minute observation.

The reliability of coding the items above, as suggested by Coggins and Carpenter (1981), is reported at ninety-one percent agreement in coding completed by graduate speech-language pathology students trained in the procedure. Paul stated that the most common error in coding is over attribution of intention. To prevent this type of error, three criteria were proposed to assure that the child's behavior was communicative. The criteria were as follows: that the message be directed to the adult, that it be meant to have an effect on the receiver, and if necessary, the child must be persistent in presenting the message to the receiver (Paul, 1987).

This procedure was not designed as a standardized or quantitative assessment. It was designed to provide

information about the general frequency of intentional communication, and to identify the range of functions expressed, as well as the mode of expression. These three pieces of information in combination with information about the child's overall speech behavior, may provide information to the clinician concerning the child's communicative competence and possible directions for intervention (Paul, 1987).

In summary, two methods of research and clinical assessment for communication intentions have been employed. The use of elicitation tasks and low structured interaction both provide information about the communicative abilities of prelinguistic and linguistic children. Each of these methods may be used reliably and appear to be best suited for evaluating certain functions. Researchers have found a group of intentions which are common to the communication development of young children. Research methods including operational definitions of communication functions, observation of more than a few children, and reliability information were proposed as essential by Coggins and Carpenter (1981). Use of a short informal parent/child interaction as proposed by Paul (1987) in combination with the functions and methods used in studies by Coggins and Carpenter (1981) and Wetherby et al. (in press) form the basis of the communication protocol employed in the current study.

Language Impaired Children and Communication Intentions

Little research exists on the analysis of communication intentions in young language disabled children. An early study addressing questions about the ability of language impaired children to use communicative acts was conducted by Snyder (1978). Fifteen children with normal language development were compared to fifteen language disabled children matched for M.L.U. and socio-economic status. All children had normal intelligence. The mean age of the normal group was 14.9 months, while the mean age of the language disabled group was 24.9 months.

Results indicated that the language disabled group was deficient in size of vocabulary and pragmatic language use. The impaired group demonstrated difficulty in using verbal performatives even though their use of non-verbal performatives such as pointing and showing were not significantly different from the normal group. Language disabled children did encode the new, more informative element in the message by means of a non-linguistic mode, but they encoded such information linguistically significantly less often. In general the language disabled children were more tied to the concrete and obvious than the normally developing children. The normal group's behavior was consistent with Stage 6 of Piaget's Sensorimotor period by referring to past experiences, persons or

objects related in some way to the new experiences (Snyder, 1978).

Rom and Bliss (1981) compared the verbal communicative skills of language impaired children with two groups of normally speaking children. The first group consisted of twenty normal children with a mean age of 4.29 years, the same as the twenty language impaired children. The second normal group was comprised of twenty children younger than the impaired group by approximately 1.5 years, but matched with the impaired group for M.L.U. Ten speech acts were examined during a free play interaction.

Rom and Bliss reported that the language impaired and the normally speaking younger group used significantly fewer utterances than the older normally speaking group. The normally speaking older children used the speech acts of describing and acknowledging significantly more frequently than the younger normals and the language impaired children. Answering was used significantly more frequently by the language impaired group than by either of the normal groups. Requesting an action was expressed significantly more frequently by the normal younger children than the other two groups. All three groups used describing most frequently. The language impaired subjects expressed a variety of communication intentions which Rom and Bliss concluded to be a demonstration of pragmatic ability. They also concluded that language impaired children in this

study demonstrated a quantitative difference rather than qualitative differences from their normally speaking peers. The impaired children demonstrated linguistic impairment in reduced verbal production (Rom & Bliss, 1980).

To summarize, the limited amount of research into the communicative function of young language delayed children has indicated both differences and similarities with normal children. The language delayed children use verbal means of communication less frequently than normally developing children. They tend to demonstrate lower levels of performance in the developmental continuum consistent with the performance of younger normal children. The language delayed children have been observed to demonstrate the ability to communicate the same range of communicative functions as normal children, but do this less frequently.

Mother-Child Interaction

Mother-Child interaction has been studied by many researchers to determine the existence and type of adaptations used by mothers when interacting with their young children. Research has shown that mothers of normal as well as language delayed children make adaptations in their speech (Conti-Ramsden and Friel-Patti, 1983, 1984; Jocic, 1978; Ringler, 1978). Conti-Ramsden (1985) suggests that the mother is not the sole responsible member of the interaction dyad. She proposes that the main issue of

importance is how the child takes the linguistic environment provided by the mother and responds to it. This study has examined the child's role only in the mother-child or parent-child dyad. Examination of the parent's role warrants further investigation; however, it is beyond the scope of this study.

CHAPTER III

METHODS AND PROCEDURES

METHODS

Subjects

A total of fifty-six toddlers between sixteen and thirty four months of age were included in this study. These toddlers were divided into two groups, one group consisting of twenty-eight children identified as normal in expressive language development, the other group consisting of twenty-eight children defined as delayed in expressive language (ELD). The mean age in months of the normal group was 25.43 $\pm$ 4.58. The mean age of the ELD group was 25.18 months $\pm$ 3.95 months.

The subjects were obtained from three sources as part of a larger study conducted at Portland State University.

1. All parents of children between sixteen and thirty months of age seeking well-baby care for their children during a five month period at three pediatric clinics in the Portland Metropolitan area were asked to complete a questionnaire concerning their children's expressive vocabularies. These clinics were

Kaiser Permanente Beaverton, Kaiser Permanente Health Center East and the Metropolitan Clinic. See Appendix A for the letter to parents and the questionnaire.

2. Parents responded to a request for expressive language delayed subjects broadcast on a Portland metropolitan area radio station.
3. Parents responded to a newspaper article in the Oregonian concerning the large study conducted at Portland State University requesting subjects.

Parents responding to the radio broadcast and the newspaper article also completed the questionnaire.

Intake criteria for inclusion in the expressively delayed group was based on the following information as reported by the parents on the questionnaires.

The child was:

1. Fifteen months to seventeen months of age and producing less than five words.
2. Eighteen months to twenty-three months of age and producing less than ten words.
3. Twenty four months of age or over and producing less than fifty words, or no two word combinations.

All children with a vocabulary size exceeding these criteria at the designated ages were included in the normal

group. Twenty-nine normal subjects and forty-five expressively delayed subjects were selected by Rhea Paul Ph.D. and assigned by her to the delayed or normal group based on the above listed criteria. This researcher remained blind to the group assignment for each subject until after the completion of both data gathering and data coding. Following completion of the coding process, twenty-eight normally developing subjects and twenty-eight expressively delayed for the current study were selected by this researcher from the pool of seventy-four children. The following criteria were used in selection.

1. Each subject passed a speech reception screening at 25 dB. Screening was conducted by graduate audiology students under supervision of an audiology instructor or by the audiology instructor.
2. Each subject obtained a score of 85 or better on the Bayley Scale of Infant Development.
3. The groups were matched on the basis of sex, race, socio-economic status as calculated by a four factor index of social position (Myers and Bean, 1965), and mean age. Table I presents a summary of the demographic data. See Appendix B for detailed demographic data.

Parents were informed both orally and in writing about the nature of the study. Parents provided written

permission for participation in the study as well as permission to videotape a ten minute parent-child interaction. See Appendix C for a copy of the letter to parents and consent form.

TABLE I

SUMMARY OF DEMOGRAPHIC DATA

Group	Mean Age in Months	SES	Race	Sex
Normal	25.43	2.46*	89% White 11% Minority	64% Male 36% Female
Group	25.18	2.86*	89% White 11% Minority	64% Male 36% Female

* Based on a scale of 1 to 5 with 1 being the highest socio-economic status and 5 being the lowest.

Environment and Equipment

Videotaping took place in a small classroom at Portland State University with the video camera and a graduate assistant who operated the camera in the room with the subjects. Two graduate students, including this researcher, video taped each parent and child dyad. Each pair of subjects sat on a carpeted area of the floor during the taping procedure. A Panasonic Vicon WV-3150 video camera and an Electrovoice professional dynamic microphone were used in conjunction with a Panasonic NV 8200 video cassette recorder to record all parent/child interactions.

Videotapes were coded using a Mitsubishi HS-337UR video cassette recorder with remote control.

A standard set of toys was provided for each parent and child pair to play with during the taping session. The assortment of toys included dolls, a telephone, dishes, dolls, blocks and stacking toys, cars, a xylophone, and Disney Poppin' pals. Each parent was given the following standard instruction. "Please play with your child as you normally would at home. I will be videotaping you for ten minutes."

Instrument

Coding of videotapes was completed by means of a system compiled by the investigator, based on previously developed coding systems by Coggins and Carpenter (1981) Wetherby et al. (in press) and Paul (1987). The functions were chosen because they represented communication functions commonly used by children in the age range of this study and they are defined and analyzed in research literature. Three groups of functions examined are regulatory, social interaction and joint attention. Specific functions are identified within each general category. Regulatory functions include requests for action, requests for object and protests. Social interaction functions are comprised of requests for a social routine, greetings, showing off, calling, requests for permission and acknow-

ledgements. Joint attention functions include comments, requests for information and requests for clarification. Five forms of expression of these functions are also included in the coding system. These are gesture, vocalization, gesture plus vocalization, single word and word combination. (See Appendix D for the coding form.)

Procedures

Criteria for the coding procedure and protocol guidelines were defined in writing and were adhered to strictly. All coding was conducted by this researcher. See Appendix E for coding instructions.

Each tape was viewed in its entirety prior to commencing the coding procedure in order to familiarize the coder with the overall style of the interaction and to time exactly ten minutes of interaction. The location on the tape counter was noted at the end of exactly ten minutes. The coder was permitted to view each tape as often as needed to accurately list each intention expressed. Following completion of coding, the coder viewed the tape again in its entirety to check for accuracy in recording intentions.

The coder recorded the location of each intention observed on the appropriate line within the appropriate column on the coding sheet as indicated by the tape counter. This aided in accuracy and reliability scoring.

Any questionable events such as gestures which could be interpreted either as reaching or pointing were not coded to avoid over attribution of intentionality. The child's intentionality in communication was determined on the basis of the presence of one or more of the following:

1. The child established gaze or focus on the parent. He/she preceded or accompanied the intention by looking at the parent.
2. The child touched the parent to establish the parent's attention.
3. The child called the parent using "Mommy", "Look", "See", etc. or vocalizations that direct the parent's attention.
4. Prior establishment and continuation of joint attention between parent and child.
5. The child cannot be distracted from the desired goal.

Non-directed behaviors such as self-talk and talk directed toward a toy or object were not coded. For example, talking on the toy phone to someone other than the parent present was not coded.

The five modes or forms of communication coded were gesture, vocalization, gesture plus vocalization, single word, and word combination. Behaviors termed as gesture included intentional head nods, pointing, foot stomping, pushing away, touching and giving or showing an object to

the parent. Giving or showing an object to the parent required an interpretation of the child's intention, because such behavior could be a request for an action request for information, a comment, or a simple act of giving or showing. Simple acts of giving or showing were not coded as a communication intention. Showing was interpreted as intentional communication when the child accompanied the showing behavior with a directed gaze from parent to the object, touching of the parent to get attention before showing the object, vocalization accompanying showing and/or persistent showing until the parent acknowledged the child and object.

Vocalizations were defined as phonetically consistent forms or sounds that were not intelligible or conventional words, but were obviously intentionally communicative such as /di/. Intentions were also coded under the vocalization category when the child's message was not intelligible due to articulation errors, coder unfamiliarity with the child's speech patterns, or because of videotaping conditions and competing noise such as from banging of toys masked the message, but the conditions existed to interpret the vocalization as intentional communication.

Gesture plus vocalization forms were acts in which gestures and vocalizations, as defined above, were present simultaneously. The single word form consisted of individual words which were intelligible and directed to the

parent. Comments such as "Oh, Oh", "Wow", and "meow" were not coded as single words, but were coded as vocalizations. Word combinations were coded when more than one word was combined in a functional unit and spoken to the parent. Simple repetitions of the same word such as "doggy, doggy" were coded as a single word.

Reliability

Six tapes, three from each of the two research groups, were selected through the use of a random number table to be independently coded by a trained graduate student. Percentage of agreement was calculated from the number of agreements in the three major categories of communication intentions within each of the five modes of communication. Inter-rater reliability was eighty-two percent. Intra-rater reliability was established by recoding the same six tapes chosen for inter-rater reliability, and was calculated at ninety-two percent.

CHAPTER IV

RESULTS AND DISCUSSION

RESULTS

The data gathered from the two groups, ELD group and normally developing group, were compared in terms of the number and range of intentions expressed, and the modes of that expression. Sub-groups within the delayed group were identified in response to the questions asked in Chapter I.

Hypotheses

A. There is no significant difference in the number of different intention types expressed by normally developing and expressive language delayed toddlers.

A one-tailed t-test comparing the mean number of different types of intentions expressed by the delayed and normal groups was computed at a significance level of $p < .05$. The null hypothesis as stated above was not rejected, indicating that there was no significant difference between the normally developing children and the ELD children in the number of different types of communication intentions expressed. The results of the comparison of the two means are reported on Table II.

TABLE II

RESULTS OF A ONE-TAILED t-TEST COMPARING THE MEANS OF THE NUMBER OF DIFFERENT INTENTION TYPES EXPRESSED BY THE NORMALLY DEVELOPING GROUP AND THE ELD GROUP

Group	Mean	t-test
Delayed	4.14	1.585
Normal	4.79	

Critical Value of t = 1.645 (.05, inf.)

B. There is no significant difference in the frequency of communication intentions expressed by normally developing and expressively delayed toddlers.

The one-tailed t-test comparing the means of the total number of communication intentions expressed by the two groups resulted in rejection of the above null hypothesis at a level of significance of $p < .005$. Therefore, it was concluded that the normally developing group expressed significantly more intentions overall than the expressively delayed toddlers. Results of the t- test are reported in Table III.

The data were further analyzed by examining the distribution of intentions within the three main categories of intentions: regulatory, social interaction and joint attention. Table IV reports the means and standard

deviations for the three categories within the normal and ELD groups. See Appendix F for individual subject data.

TABLE III

RESULTS OF A ONE-TAILED t-TEST COMPARING THE MEANS OF THE TOTAL NUMBER OF COMMUNICATIONS INTENTIONS EXPRESSED BY THE NORMALLY DEVELOPING GROUP AND THE ELD GROUP

Group	Mean	t-test
Delayed	28.75	7.55*
Normal	45.36	

* Significant at $p < .005$.

TABLE IV

MEANS AND STANDARD DEVIATIONS OF INTENTIONS EXPRESSED BY THE NORMAL AND ELD SUBJECTS

Category	Mean	(S.D.)
Group: Normal		
Regulatory	4.32	(3.57)
Social Interaction	1.93	(2.65)
Joint Attention	39.11	(16.45)
Group: Delayed		
Regulatory	5.79	(4.95)
Social Interaction	.93	(1.21)
Joint Attention	22.04	(11.62)

The data were examined for the existence of significant differences between the means within the groups and

between the groups using a split plot factorial design (SPF) with repeated measures on the "types" factor. There were significant main effects for group, type and a significant group x type interaction. The significant interaction between group and type was interpreted in relation to the degree of difference between the two groups in numbers of intentions expressed. The degree of difference between the groups was different for each of the three intention categories. Another variation in the differences between the two groups was shown in the group expressing the most intentions in each category. The normal group expressed more intentions in the joint attention and social interaction categories, but the ELD group expressed more intentions in the regulatory category. The results of the SPF test are reported in Table V.

TABLE V

SUMMARY OF RESULTS OF A SPF TEST COMPARING USE OF CATEGORIES OF INTENTIONS EXPRESSED BY NORMAL AND ELD TODDLERS

Source of Variation	SS	d.f.	MS	F
Between subjects	4992.16	55		
Groups	1287.05	1	1287.05	18.76*
Within Groups	3705.11	54	68.61	
Within Subjects	39572.12	112		
Category	26445.29	2	13222.65	168.37*
Groups X Category	4545.76	2	2322.88	29.58*
Category X Subject Within Groups	8481.07	108	78.53	

* Significant at $p < .001$

The Tukey Test of Honest Significant Difference was conducted to determine specific differences between pairs of means. Significant differences existed between the following pairs of means for categories within the ELD group: joint attention and social interaction, joint attention and regulatory. Significant differences existed between the following pairs of means for categories within the normally developing group: joint attention and social interaction, joint attention and regulatory. Significant differences existed between the two groups in one category, joint attention, with the normal subjects using significantly more intentions in this category than the ELD subjects. Results of the Tukey Tests within and between categories for both groups are reported in Table VI, VII, and VIII.

TABLE VI

RESULTS OF THE TUKEY TEST OF HONEST SIGNIFICANT DIFFERENCE COMPARING THE MEANS OF CATEGORIES OF INTENTIONS WITH THE NORMAL GROUP

	Social Interaction	Joint Attention
Regulatory	2.03	29.48*
Social Interaction		31.51*

Critical q = 4.20
* Significant at $p < .01$

TABLE VII

RESULTS OF THE TUKEY TEST OF HONEST SIGNIFICANT DIFFERENCE COMPARING THE MEANS OF CATEGORIES OF INTENTIONS WITHIN THE ELD GROUP

	Social Interaction	Joint Attention
Regulatory	4.06	13.77*
Social Interaction		17.90*

Critical q = 4.20
* Significant at p < .01

TABLE VIII

RESULTS OF THE TUKEY TEST COMPARING MEANS BETWEEN THE ELD AND NORMALLY DEVELOPING GROUPS FOR CATEGORIES OF INTENTIONS

Regulatory	Social Interaction	Joint Attention
.9	.61	10.41*

Critical q = 3.73
* Significant at p < .01

The most frequently used category in both the normal and delayed groups was the joint attentional category. Intentions within this category accounted for 86% of the intentions expressed by the normal group, and 77% in the expressively delayed group. Commenting, a joint attention communication intention, was the most frequently used individual intention in the normal and delayed groups. 74% of all the intentions expressed by the normal subjects were comments, while 68% of all intentions expressed by the

delayed subjects were comments. Despite the similarity in relative frequency, normals used joint attention with significantly greater absolute frequency.

Sub-Groups

1. Are there differences in the expression of communication intentions within the delayed group that identify children as belonging to a sub-group?

Four sub-groups were identified within the expressive language delayed group when comparison was made with the normally developing group. The sub-groups were formed on the basis of comparisons of the data for individual subjects in the delayed group to the means for the normal group in terms of: 1. number of types of intentions expressed, and 2. the total number of intentions expressed. A difference of more than one standard deviation below the mean of the normal group qualified a subject for sub-group membership. See Table IX for means, standard deviations and cut-off scores.

Sub-Group A

Is there a sub-group which expresses a limited variety of intentions and fewer intentions overall than the normal group?

A sub-group using three or less different types of intentions and twenty-eight or less total intentions was

identified as Sub-Group A, and consisted of seven of the twenty-eight delayed subjects (25%). These children may be described as having an overall depressed range and frequency of communication intentions.

TABLE IX

MEANS AND STANDARD DEVIATIONS OF DIFFERENT INTENTION TYPES AND TOTAL INTENTIONS EXPRESSED BY THE NORMALLY DEVELOPING GROUP USED TO DETERMINE CUT-OFF SCORES FOR SUB-GROUP ASSIGNMENTS

Variable	Mean	(S.D.)	Cut-Off
Different Intention Types	4.79	(1.73)	3.06
Total Intentions Expressed	46.36	(16.67)	28.69

Sub-Group B

Is there a sub-group that expresses a broad variety of intentions, but with less frequency than the normal group?

A sub-group using four or more different types of intentions, but twenty-eight or less total intentions was identified as Sub-Group B, and consisted of seven of the twenty-eight subjects (25%). These children expressed a variety of intentions similar to the normally developing subjects, but with less frequency than the normally developing group.

Sub-Group C

Is there a sub-group that expresses a limited variety of intentions, but uses this limited variety of intentions with normal frequency?

A sub-group using three or less different types of intentions but twenty-nine or more intentions totally was identified as Sub-Group C, and consisted of two of the twenty-eight expressively delayed subjects (7%). This sub-group was the smallest of the four sub-groups. These children expressed fewer different intentions than the normally developing group, but they expressed the limited range of intentions with frequency comparable to that of the normally developing group.

Sub-Group D

Is there a sub-group that looks normal in terms of communication, and is delayed only in terms of expressive language?

A sub-group using four or more different types of intentions and twenty-nine or more total intentions was identified as Sub-Group D, and consisted of twelve of the twenty-eight expressively delayed subjects (43%). These children appeared to be like the normally developing subjects on the basis of the number of different intentions expressed and the frequency of expression, however, they

were defined as expressively delayed by intake criteria on expressive vocabulary size.

The twelve subjects in Sub-Group D were compared to the sixteen subjects in Sub-Groups A, B, and C combined for mean age. A t-Test was conducted to compare the mean age of Sub-Group D and the mean age of the other three sub-groups combined. A significant difference was found between the two means. Results of the t-Test are reported in Table X.

TABLE X

RESULTS OF THE t-TEST COMPARING THE MEAN AGE OF SUB-GROUP D TO THE MEAN AGE OF SUB-GROUP A, B, AND C COMBINED.

Sub-Group	Mean	(S.D)	t
Sub-Group D	27.25	(2.71)	
Sub-Group A,B,C Combined	23.63	(3.84)	3.04*

* Significant at $p < .005$

The communicative maturity of the subjects in Sub-Group D was compared to that of the other sixteen subjects by examining the use of the verbal modes of communication, single word and word combination. A t-Test was conducted to compare the two means for the combined number of intentions expressed in the modes of single word and word combination. A significant difference was found. The results of the t-Test is reported in Table XI.

TABLE XI

RESULTS OF THE t-TEST COMPARING THE MEAN NUMBER OF INTENTIONS EXPRESSED IN THE VERBAL MODES BY SUB-GROUPS OF SUBJECTS

Sub-Group	Mean	(S.D.)	t
Sub-Group D	14.75	(10.07)	
Sub-Groups A,B,C Combined	2.75	(3.02)	4.545*

* Significant at $p < .005$

Communication Modes

2. Do the normally developing subjects express themselves using different forms of expression than the ELD's?

The forms or modes of communication employed by each group in expression of communication intentions were analyzed for any preference within each group and significant differences between the two groups in the use of these modes. Five modes of communication were examined, gesture, vocalization, gesture plus vocalization, single word and word combination. Gesture, vocalization, and gesture plus vocalization were considered to be non-verbal communication, while single word and word combination were termed verbal communication. Table XII reports the total number of intentions expressed, means, and standard deviations for each of the five modes in the delayed groups

and normal groups. Appendix F reports the data for individual subjects in the five modes of communication.

TABLE XII

MEANS AND STANDARD DEVIATIONS FOR THE FIVE MODES OF COMMUNICATION IN THE TWO GROUPS

Mode	Mean (S.D.)
Group: Normal	
Gesture	.43 (1.0)
Vocalization	7.82 (8.88)
Gesture + Vocalization	2.75 (5.65)
Single Word	8.18 (6.05)
Word Combination	26.18 (23.17)
Group: Delayed	
Gesture	1.93 (2.34)
Vocalization	12.50 (6.91)
Gesture + Vocalization	6.43 (6.01)
Single Word	4.64 (5.28)
Word Combination	3.25 (6.96)

A split plot factorial (SPF) design test with repeated measures on the "modes" factor was calculated to determine the existence of significant differences in the modes on communication within the normal and delayed groups and between these groups. The results of this test showed that there were significant main effects for all modes of intentions and groups as well as a significant groups x modes interaction effect. Examination of the significant result for groups x modes, the interaction effect, indicates that the normal group and the ELD group differ in the rank order of mode usage, variations in which group

expressed the most intentions in any of the modes, and the degree of difference in frequency of expression. Results of this SPF test are summarized in Table XIII.

TABLE XIII

SUMMARY OF RESULTS FROM A SPLIT PLOT FACTORIAL TEST COMPARING THE FIVE MODES OF COMMUNICATION USED BY THE NORMAL AND EXPRESSIVELY DELAYED GROUPS

Source of Variation	SS	d.f.	MS	F
Between subjects	8723.83	55		
Groups	772.23	1	772.23	5.24*
Within Groups	7951.60	54	147.25	
Within Subjects	28399.94	224		
Modes	6087.48	4	1521.87	21.88**
Groups X Modes	7290.22	4	1822.56	26.21**
Modes X Subject within groups	15022.24	216	69.55	

* significant at $p < .05$
** significant at $p < .001$

Tukey's Test was conducted to determine the significantly different pairs of means for the communication modes used by each group and between groups. It was found that the most frequently used mode of communication for the ELD group was vocalization. It was used significantly more frequently compared to any of the other four modes of communication. See Table XIV for results of Tukey test for modes within the ELD group.

TABLE XIV

RESULTS OF THE TUKEY TEST COMPARING MEANS FOR THE MODES EXPRESSED BY THE ELD GROUP

	Word Combo.	Word	Gesture + Vocal.	Vocal.
Gesture	1.19	2.44	4.05	9.52*
Word Combo		1.25	2.86	8.30*
Word			1.61	7.08*
Gesture + Vocal.				5.47*

Critical q = 4.60
* Significant at $p < .01$

The most frequently used mode of communication for the normal group was word combination. Word combination was found to be used significantly more than the other four modes of communication. Single word mode was also found to be significantly more frequent than gestures or gesture and vocalization. See Table XV for results of the Tukey test for modes within the normal group.

Comparisons of modes between the two groups yielded only one significant result. The word combination mode was the only mode in which showing a significant difference of means between groups. The normally developing group used significantly more intentions in the word combination mode than the ELD group. Results of the Tukey test for modes between groups are reported in Table XVI.

TABLE XV

RESULTS OF THE TUKEY TEST COMPARING MEANS FOR THE MODES EXPRESSED BY THE NORMAL GROUP

	Gesture + Vocal.	Vocal.	Word	Word Combo
Gesture	2.09	6.66*	6.98*	23.20*
Gesture + Vocal		4.57	4.89*	21.11*
Vocal.			.33	16.54*
Word				16.22*

Critical q = 4.60
* Significant at p < .01

TABLE XVI

RESULTS OF THE TUKEY TEST COMPARING THE MEANS BETWEEN GROUPS FOR MODES OF COMMUNICATION

Gesture	Vocalization	Gesture + Vocal.	Word	Word Combo.
.86 ELD > Normal	2.69 ELD > Normal	2.11 ELD > Normal	2.03 Normal > ELD	13.19* Normal > ELD

Critical q = 3.47
*Significant at p < .0

The most prevalent category of intentions for both the ELD and normally developing group was joint attention. To examine the mode of expression for this intention, the data on modes for the joint attention category in both groups were analyzed using a SPF test and the Tukey

procedure. Significant differences were found for modes within the groups, between the groups and for modes x groups. Analysis of the interaction of modes and groups indicated that the rank order of use of modes differed for each group and the frequency rates of use varied among modes. Table XVII reports the results of this SPF test.

TABLE XVII

RESULTS OF THE SPF TEST COMPARING MODES OF COMMUNICATION IN THE JOINT ATTENTION CATEGORY IN THE TWO GROUPS

Source of Variation	SS	D.F.	M.S.	F
Between Subjects	3006.34	55		
Group	816.01	1	816.01	14.57*
Within Groups	2190.33	54	40.56	
Within Subjects	28398.00	224		
Modes	5560.99	4	1390.25	17.72*
Groups X Modes	5794.49	4	1448.62	18.36*
Modes X Subjects Within Group	17042.52	216	78.90	

* Significant at $p < .001$

The results of the Tukey comparisons of the means within the modes of communication for joint attention and between the groups of subjects indicated that the ELD subjects used the verbalization mode significantly more often than the normally developing subjects. The normal subjects used word combination significantly more than the other four modes. As in the results of the SPF test for modes, the only mode showing a significant difference was

word combination. Results of the three Tukey tests are reported in Tables XVIII, XIX and XX.

TABLE XVIII

RESULTS OF THE TUKEY TEST FOR THE MODES OF COMMUNICATION WITHIN THE JOINT ATTENTION CATEGORY USED BY THE ELD GROUP

	Word Combo	Word	Gesture + Vocal.	Vocal.
Gesture	1.44	2.56	2.54	8.46*
Word Combo		.30	1.10	6.72*
Word			.80	5.92*
Gesture + Vocal.				5.92*

Critical q = 4.60
*Significant at p < .0

TABLE XIX

RESULTS OF THE TUKEY HSD TEST FOR THE MODES OF COMMUNICATION WITHIN THE JOINT ATTENTION CATEGORY FOR THE NORMALLY DEVELOPING GROUP

	Gesture + Vocal.	Word	Vocal.	Word Combo
Gesture	1.34	5.67*	5.88*	19.48*
Gesture + Vocal		6.01*	4.54	18.13*
Word			.002	13.81*
Vocal.				13.60*

Critical q = 4.60
* Significant at p < .01

TABLE XX

RESULTS OF THE TUKEY HSD TEST FOR MODES OF COMMUNICATION WITHIN THE JOINT ATTENTION CATEGORY BETWEEN THE ELD AND NORMALLY DEVELOPING GROUP

Gesture	Vocal.	Gesture + Vocal.	Single Word	Word Combo
.60 ELD > Normal	2.6 ELD > Normal	1.53 ELD > Normal	2.44 Normal > ELD	13.44* Normal > ELD

Critical q = 3.66
* Significant at p < .01

DISCUSSION

The results of the data analysis showed that the ELD subjects in this study communicated significantly less overall, as measured by the total intentions expressed, than the normally developing subjects. Despite the overall difference in frequency of communication, both groups appeared similar in number of different categories of intentional expression used. No significant difference could be determined in the number of different intention types used by the groups. Therefore, although the ELD toddlers were less expressive overall, they were capable of communicating with the same number of different communication acts as the normally developing toddlers.

These results are consistent with the results of a study conducted by Rom and Bliss (1980), although the procedures of the two studies were different. Their language impaired subjects were compared to younger normal children. The age matched delayed children demonstrated a lower rate of communication than the normal subjects, but did not demonstrate a lack of variety of communication intention types. Rom and Bliss concluded from these results that the difference between the normal and language delayed children was quantitative rather than qualitative.

Analysis of the different categories of intentions indicated that the normal and expressively delayed subjects used the three intentional categories in the same relative

order. In both groups, joint attention was the most frequently used category, followed by the regulatory category, and finally the social interaction category. This finding reflects the data on use of different intentions in the ELD group, and supports the conclusion that this group of toddlers is not lacking in the basic tools of communication, but is not using them as frequently as their normal language peers.

Although joint attention was the most frequently used category by both groups, the normally developing toddlers used significantly more joint attention intentions than the ELD group. Within the joint attention category, comment was by far the most frequently used intention by both groups. The importance of the presence of the joint attention intention of commenting and the difference in frequency between the two groups may be explained in light of Bruner's discussion of the role of joint attention. Bruner (1983) proposed that joint attention develops along a continuum from early infancy. It leads to the foundation from which commenting develops and the development of adult conversational skills. The child becomes aware that words or word-like forms are used when manipulating objects. Considering Bruner's proposal, it could be theorized that the expressively delayed children have an awareness of the usefulness of joint attention and comments, but for some reason, presently unknown, these children do not use

comments frequently and do not develop joint attention intentions at a developmental rate commensurate with their normally developing age mates.

It has been noted that children with expressive language delays are a heterogeneous group. It is difficult if not impossible to make general statements about all language delayed children. To address the issue of heterogeneity, the data were analyzed to identify possible groups. The four questions asked in Chapter 1 resulted in the placement of all twenty-eight subjects into one of four sub-groups. The sub-groups were defined on the basis of the data from the normally developing group.

The largest sub-group within the expressively delayed group was identified as Sub-Group D, those children who appeared to be communicatively normal in the number of different intentions expressed and the frequency of expression of those intentions, but were defined as expressively delayed by intake criteria on expressive vocabulary size as reported by the parent. Additional analysis of this sub-group in relationship to the other three sub-groups indicated that the mean age of these children was significantly greater than that of the other groups combined. These children also employed a significantly greater number of verbal intentions than Sub-Groups A, B, and C combined.

Based on the comparisons of sub-groups and communicative ability as measured by quantity of communication

intentions and mode of communication, communicative competence appears to increase with age as it does in the normally developing children. Wetherby et al. (in press) found that their normally developing subjects showed increases in frequency of communication and in sophistication in modes of communication with increase in age.

Sub-Group D employed verbal modes communication (single word and word combination) at a statistically significant rate when compared to the other groups. This does not mean, however, that Sub-Group D employed verbal communication at the same rate as the normally developing group. The mean number of verbal intentions expressed by Sub-Group D was 14.75, whereas the mean number of verbal intentions expressed by the normally developing group was 34.36. In addition to the large difference in verbal intentions between these children, there exists the fact that the mean age of Sub-Group D (27.25 months) is greater than the mean age of the normal subjects (25.43 months).

The smallest sub-group identified among the expressively delayed children was Sub-Group C. This group expressed a smaller number of different intentions than the normal group, but expressed that small number of intentions within the frequency range of the normal group. Only two subjects met the criteria for inclusion in this group. These children displayed an atypical profile of communication within this study and as compared to the study of Rom

and Bliss (1980). Given previous data from Rom and Bliss and the data from the current study, one would not expect to find more than a very small number of toddlers in the expressively delayed population presenting this profile.

Sub-Groups A and B were equally distributed, representing a total of fifty percent of the subjects. Twenty-five percent of the subjects, those in Sub-Group A, displayed an overall communication deficit. They demonstrated a lower number of different intentions and they expressed those intentions with less frequency than the normally developing group. It therefore appears that these children present a profile contrary to that of the expressively delayed group as a whole. They are both qualitatively and quantitatively different from the normally developing toddlers.

Sub-Group B represents twenty-five percent of the delayed subjects who reflect the overall profile of the ELD subjects in this study. These toddlers used the same number of different intentions as the normal group, but did not express them as frequently as the normal group. These children, although not expressing intentions as often as normal children, appear to have the same basic communicative abilities to be expressive as the normally developing children.

Quantity of expression and range of intentions expressed are not the exclusive differences between the

expressive language profiles of the normally developing and expressively delayed subjects. The preferred modes of communication used by each group are significantly different and illustrate the level of communication ability of each group. The normally developing children used the mode of word combination most frequently, while the expressively delayed group used vocalization most frequently. These modes were statistically significant over the other four modes used within each group.

The forms or modes of communication used to express the communication intentions observed provide an important view of the difference between the expressive abilities of the two groups of toddlers. The basic difference may be described as non-verbal versus verbal communication. The normal children employed the word combination mode of expression significantly more frequently than any other mode coded. The second most frequently employed mode was the single word. In contrast, the ELD group used the vocalization mode statistically more frequently than the other four modes of communication, and gesture plus vocalization second most frequently. Therefore, word combination appears to be the mode of preference for the normally developing group, and vocalization appears to be the mode of preference for the ELD group.

Comparisons between the two groups for each of the five modes of communication yielded significant results

in only one the five modes. The normally developing group used word combinations significantly more frequently than the ELD group. The ELD group used the non-verbal modes of communication, gesture, vocalization and gesture plus vocalization more often than the normally developing group, but not at a statistically significant level.

The greatest difference between the groups in the use of an individual mode of communication was displayed in word combination. The normally developing group used word combination eight times more frequently than the ELD group. The difference between the two groups for vocalization, the mode of preference for the ELD group, is not so dramatic. The ELD group used vocalization one and a half times more often than the normally developing group. The lower ratio is likely a result of the overall lower rate of communication observed in the ELD toddlers. It is also likely that the rules for the coding procedure increased the number of vocalizations in the normally developing group, since any instance of intentional communication that was not intelligible was coded as a vocalization.

It may be concluded that the expressively delayed group in general was less sophisticated in the form or mode of their communication than the normal group. They used earlier developing communication forms (gesture, vocalization and gesture + vocalization), and as a whole could be described as in Bates' illocutionary phase of language

development, while the normal group could be described as locutionary. Although the expressively delayed children did not use true words in large numbers, they did not use gesture in large numbers either. The conclusion may be drawn that these delayed children are aware of the communicative function of vocal sound and have discovered that it is more effective in interacting with their environment than gesture.

Results of this study are compared to the results of Wetherby et al. (in press). Although research methods differ, the results among the normal subjects in the two studies are similar. The subjects in both studies used the joint attention and regulatory categories of intentions most frequently. The rate of communication for the subjects at the multi-word phase of linguistic development in the Wetherby study was calculated at five intentions per minute. The normal subjects in the current study may be considered to be at an equivalent level of linguistic development based on their age and the predominance of word combination expressions of communication intentions. The rate for the normal subjects in the current study is 4.5 intentions per minute.

The similarity of results for per minute expression rates and distribution of intentions in the major categories indicates that the ten minute, low structured parent/child interaction can yield results similar to a

longer, more structured clinician/child interaction. Differences exist in the number of different intentions expressed, but this is likely due to the fact that Wetherby et al. elicited specific communication intentions. Wetherby et al. (in press) report a mean number of intentions of nine. The mean number of different intentions in this study is 4.79. The current study may not measure the full range of communication intentions within the toddler's repertoire, but it does give an indication of how the child performs in daily interaction with a significant person in their environment.

The ELD subjects show a general relationship to the younger normal subjects from the Wetherby study. The per minute rate of expression is lower than the normal Wetherby subjects in the multi-word stage, but it is higher than the per minute rate for both the prelinguistic and single word stages. The prelinguistic rate in the Wetherby study is one intention per minute and the rate for the single word stage is two intentions per minute (Wetherby et al. in press). The per minute rate for the ELD subjects is 2.87 intentions per minute. The per minute rates employed by the ELD children lead to the conclusion that this group of children is less mature than the normal group and rather than being deviant from the normal group, more closely resembles the communicative abilities of younger normally developing children.

CHAPTER V

SUMMARY AND IMPLICATIONS

SUMMARY

Research into the development of intentional communication has centered on children exhibiting patterns of normal language development. Researchers have described the communication behaviors of very young children from their first intentional acts of communication at around ten months of age to their entry into the adult language system at about three years old. Protocols for the identification of the communication intentions expressed by normally developing children as well as children presenting expressive language delays have involved elicitation of communicative acts, low structured interaction samples or a combination of the two types of procedures.

This study, based on a low structured mother/child interaction, examined the communication intentions expressed by twenty-eight normally developing toddlers and twenty-eight toddlers presenting an expressive language delay. These groups were matched for age, sex, and socioeconomic status, all passed a hearing screening at 25 dB and scored at least 85 on the Bayley Scales of Infant Development.

A protocol to identify expressions of communication intentions commonly used by children under three years of age was devised based on the work of Wetherby et al. (in press) and Paul (1987). Parent/child interaction was video taped during a ten minute play session. Twelve individual intentions were coded within the three broad intention categories of regulatory, social interaction and joint attention. Five modes or forms of communication were coded. Three modes, gesture, vocalization and gesture plus vocalization are termed non-verbal communication. Single word and word combination modes are called verbal communication.

Data were analyzed for significant differences between the two groups in the number of different intentions expressed and the frequency of expression. Results from the expressively delayed group was further analyzed for distinctive sub-group profiles. Results indicated that there was no difference between the normal and ELD subjects in the number of different intentions expressed. The normal group used more intentions overall than the ELD group. Both groups used the joint attention category, specifically commenting, more frequently than the other types of intentions. Four sub-groups were identified within the ELD group based on the frequency of expression and the spectrum of intentions used.

It was found that the normally developing subjects showed a significant preference for the verbal forms of communication, word combination in particular. The ELD group most frequently expressed themselves in non-verbal modes, particularly vocalization. It was also found that subjects in the sub-group of the ELD group most similar to the normal group expressed significantly more intentions than the other ELD subjects within the verbal modes of communication. Although this sub-group did employ some use of verbal communication, it was not at a rate equal to that of the normally developing subjects.

It was concluded that the ELD subjects as a group were less sophisticated in their abilities to express communication intentions although they had the ability to express the same range of intentions as their normally developing age mates. The ELD toddlers demonstrated this lower level of communication sophistication by using communication intentions at a lower frequency rate and by expressing the intentions at a lower developmental level of communication mode than the normal group. These two groups appear to show no difference in the content of what they communicate. The difference between the normally developing children and the expressively delayed children appears to be in the quantity and manner of intentional communication.

IMPLICATIONS

Research

Additional research into the communicative abilities of young children with expressive language delays is necessary to develop a clear profile which may be of assistance in early diagnosis of expressive language delays. Replication of the current study could provide information on the universality of the conclusions drawn about the communication profile of ELD toddlers. Such replications in varied geographic locations, among subjects with high, low and moderate socio-economic status, and among varying ethnic populations could be valuable in establishing the communication characteristics of ELD toddlers.

Further analysis of the data for a correlation between frequency rates and/or modes of communication and age of subjects could be valuable in determining a developmental time table for acquisition of language in young expressively delayed children. Comparison of such data to that obtained from control groups of normally developing children could also provide information relevant to formulating future research and/or clinical assessment protocols.

Investigation of the joint attention category of communication intentions in replicated studies could be of

particular importance in developing a clinical assessment tool. Since both groups in the current study used this category significantly more frequently than either of the other two categories, and since a significant difference existed between the ELD and normally developing groups in this category, it may be of particular import in development of a simple and reliable method of evaluating communicative competence. Likewise, the use of verbal versus nonverbal modes of communication within the joint attention category should be carefully examined in replicated studies. Such research should be directed toward development of a protocol that is significantly less complex than the current system, easily taught to clinicians and effective in identifying ELD toddlers.

Follow-up studies involving the ELD subjects in this study and any future replications of this study should be conducted to evaluate the predicative value of the results in general, and of each of the sub-groups identified in the ELD group. Such follow-up studies could be conducted at age five years or at entrance into kindergarten. Any clinical application of the current data until such longitudinal data are collected must be used with caution.

Clinical

Direct clinical application of the protocol developed for this study is unlikely due to it's complex nature. The

for this study is unlikely due to it's complex nature. The information about ELD children, however, may be applicable to clinical evaluation. Observation and recording of communication intentions, particularly joint attention intentions, during parent/child interaction has the potential of contributing valuable information about the child's communicative abilities. Analysis of the modes of communication in conjunction with particular intention types may also give important information about the communication skills of the child.

Examination of variety of types of intentions expressed by toddlers may at this time be the most reliable information gathered from assessment of communication intentions. This study and the study Rom and Bliss (1981) indicates that ELD children do not use fewer types of intentions than normally developing children. Since both groups expressed a mean number of intention types of approximately four intentions, children who express only one or two different types of intentions in a ten minute period may be presenting unique etiologies indicative of involvement beyond an expressive language delay.

SELECTED BIBLIOGRAPHY

AINSWORTH, M.D.S. (1973). The development of infant-mother attachment. In B.M. Caldwell and H.N. Riuciuti (Eds) Child Development Research Volume 3. Chicago, IL: University of Chicago Press.

ARWOOD, E.L. (1983). Pragmaticism: Theory and application. Rockville, MD: Academic Press.

BAYLEY, N. (1969). Bayley Scales of Infant Development. New York, NY: The Psychological Corporation.

BATES, E. (1976). Language and context: The acquisition of pragmatics. New York, NY: Academic Press.

BATES, E., BENIGNI, L., BRETHERTON, I., CAMAIONI, L., VOLTERRA, V., CARLSON, V., CARPEN, K., and ROSSER, M. (1979). The emergence of symbols: Cognition and Communication in infancy. New York, NY: Academic Press.

BATES, E., CAMAIONI, L., and VOLTERRA, V. (1975). The acquisition of performatives prior to speech. Merrill-Palmer Quarterly, 21, 205-226.

BLOOM, L. (1981). Language development in relation to cognition. In R.E. Stark, (Ed) Language behavior in infancy; and early childhood. New York, NY: Elsvier North Holland Inc.

BRETHERTON, I., and BATES, E. (1979). The emergence of intentional communication. New Directions for Child Development, 4, 81-98.

BRUNER, J.S. (1975). The ontogenesis of speech acts. Journal of Child Language, 3, 1-19.

BRUNER, J. (1983). Child's talk. New York, NY: W.W. Norton and Company.

CASBY, M.W., and CUMAPATA, J.F. (1986). A protocol for the assessment of prelinguistic intentional communication. Journal of Communications Disorders, 19, 251-260.

CHAPMAN, R. (1981). Exploring children's communicative intents. In J.F. Miller (Ed) Assessing language production in children. Austin, TX: Pro-Ed.

COGGINS, T.E., and CARPENTER, R.L. (1981). The communicative intention inventory: A system for observing and coding children's early intentional communication. Applied Psycholinguistics, 2, 235-251.

COGGINS, T.E., OLSWANG, L.B., and GUTHRIE, J. (1987). Assessing communicative intents in young children: Low structured observation or elicitation tasks? Journal of Speech and Hearing Disorders, 52, 44-49.

CONTI-RAMSDEN, G. (1985). Mothers in dialogue with language-impaired children. Topics in Language Disorders, 5, 58-68.

CONTI-RAMSDEN, G., and FRIEL-PATTI, S. (1984). Mother-child dialogues: A comparison of normal and language impaired children. Journal of Communication Disorders, 17, 19-35.

CONTI-RAMSDEN, G., and FRIEL-PATTI, S. (1983). Mothers' discourse adjustments to language-impaired and non-language-impaired children. Journal of Speech and Hearing Disorders, 48, 360-367.

DALE, P.S. (1980) Is early pragmatic development measurable? Journal of Child Language, 7, 1-12.

DORE, J. (1974). A pragmatic description of early language development. Journal of Psycholinguistic Research, 3, 343-350.

FAFOUTI-MILENKOVIC, M., and UZGIRIS, I.C. (1979). The mother-infant communication system. New Directions in Child Development, 4, 41-56.

HALLIDAY, M.A.K. (1975) Learning how to mean. New York, NY: Elsvier North Holland Inc.

HARDING, C.G., and GOLINKOFF, R.M. (1979). The origins of intentional vocalizations in prelinguistic infants. Child Development, 50, 33-40.

HOPKINS, K.D. (1978). Basic statistics for the behavioral sciences. Englewood Cliffs, NJ: Prentice-Hall, Inc.

JOCIC, M. (1978). Adaptation in adult speech during communication with children. In N. Waterson and C. Snow (Eds) The development of communication, Chichester: John Wiley and Sons.

KAYE, K. (1982). Organism, apprentice and person. In E.Z. Tronick (Ed) Social interaction in infancy: Affect, Cognition and Communication. Baltimore, MD: University Park Press.

MILLER, J.F., CHAPMAN, R.S., BRANSTON, M.B., and REICHLE, J. (1980). Language comprehension in sensorimotor stages V and VI. Journal of Speech and Hearing Research, 23, 284-311.

MYERS, J.K., and BEAN, L.L. (1968). A decade later: A follow-up of social class and mental illness. New York, NY: Wiley and Sons

LEONARD,L.B., CAMARATA, S., ROWAN, L.E., and CHAPMAN, K. (1982). The communicative functions of lexical usage by language impaired children. Applied Psycho-linguistics, 3, 109-125.

PAUL, R. (1987). A model for the assessment of communication disorders in infants and toddlers. National Student Speech Language Hearing Association Journal, 15, 88-105.

ROM, A., and BLISS, L.S. (1981). A comparison of verbal communicative skills of langauge impaired and normal speaking children. Journal of Communication Disorders, 14, 133-140.

RINGLER, N. (1978). A longitudinal study of mother's language. In N. Waterson and C. Snow (Eds) The development of communication. Chichester: John Wiley and Sons.

SNYDER, L.S. (1978). Communicative and cognitive abilities and disabilities in the sensorimotor period. Merrill-Palmer Quarterly, 24, 161-180.

WETHERBY, A.M., CAIN, D.H., YONCLAS, D.G., and WALKER, V.G. (in press). Analysis of intentional communication of normal children from the prelinguistic to the multi-word stage.

WOLLNER, S.G. (1983). Communicating intentions: How well do language-impaired children do? Topics in Language Disorders, 4, 1-14.

APPENDIX A

LETTER TO PARENTS AND QUESTIONNAIRE

COLLEGE OF
LIBERAL ARTS AND SCIENCES

DEPARTMENT OF
SPEECH COMMUNICATION
SPEECH AND
HEARING SCIENCES

PORTLAND
STATE
UNIVERSITY
P.O. BOX 751
PORTLAND, OREGON
97207
503/229-3533

June 4, 1986

Dear Parents,

We are trying to learn more about at what age children begin speaking, and what kinds of words they use when they start to talk. We would appreciate it greatly if you would answer the following questions and return this form to the nurse before you leave the office. Your cooperation in this study is voluntary and if you choose not to complete the questionnaire it will in no way affect the treatment you receive at Kaiser Permanente, at Portland State University or anywhere else. If you choose to fill out the questionnaire, I would appreciate your including your phone number so that I may contact you in case I have a question.

We would like to study a few children in greater depth, as well. If you would be interested in this later part of the study, please indicate so at the bottom of the questionnaire and give your name, address, and phone number. Again, your cooperation is completely voluntary. If you have any questions about the study, or about your child's speech, please do not hesitate to call me at Portland State University at 229-3142.

Thank you in advance for your help.

Yours,

[redacted]

Rhea Paul, Ph.D.
Assistant Professor

RP:mv

Encl.

FOR PARENTS OF CHILDREN 15-30 MONTHS OLD

What is your child's:

First name? _____

Date of birth? _____

Mother's occupation? _____

Father's occupation? _____

Mother's phone number? _____

How many different words can your child say? (It's OK if the words aren't entirely clear, as long as you understand them.)

none_____ 10-30_____
less than 5 _____ 30-50_____
5-10_____ more than 50_____

If you child says fewer than ten words, please list them here:

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

Does your child put words together to form short "sentences"?

Yes _____ No _____

If yes, please give three examples here:

_____

_____

_____

Would you be interested in participating in later parts of this study? Yes_____ No_____

Thank you for your help!

APPENDIX B

DEMOGRAPHIC DATA

DEMOGRAPHIC INFORMATION FOR THE GROUP
OF NORMALLY DEVELOPING SUBJECTS

Subject #	Age in Months	Sex	Race	SES
12	22	F	White	1
14	25	M	White	1
27	22	M	White	4
32	29	M	Black	4
36	26	F	White	1
38	23	M	White	4
39	22	M	White	2
40	25	F	White	4
41	21	M	White	2
50	24	M	White	1
55	26	F	White	3
56	21	F	White	1
58	34	F	White	1
59	34	M	White	1
63	19	M	White	3
69	16	M	Mixed	3
72	20	M	White	4
81	26	F	White	5
113	26	F	White	3
126	29	F	White	1
128	27	M	White	2
129	34	M	White	5
130	29	M	White	3
131	31	M	White	2
132	20	M	Mixed	1
133	27	M	White	4
139	30	F	White	2
143	22	M	White	1

DEMOGRAPHIC INFORMATION FOR THE GROUP
OF EXPRESSIVELY DELAYED SUBJECTS

Subject #	Age in Months	Sex	Race	SES
7	23	M	White	2
19	33	F	White	4
26	31	M	Black	3
29	26	F	White	5
51	20	F	White	4
57	20	F	White	4
84	20	M	White	2
85	28	M	White	3
86	20	M	White	2
87	24	M	White	3
89	24	F	White	4
90	28	M	White	3
91	27	M	White	3
92	32	M	White	3
93	24	M	White	3
94	31	M	White	3
98	19	M	White	2
100	29	M	White	2
101	25	F	White	4
103	25	M	White	2
107	22	M	White	2
109	21	M	White	3
111	25	F	White	3
114	24	M	Mixed	2
119	26	M	White	2
122	27	F	Black	2
142	22	F	White	1
145	29	F	White	4

APPENDIX C

LETTER TO PARENTS AND CONSENT FORM

COLLEGE OF
LIBERAL ARTS AND SCIENCES

DEPARTMENT OF
SPEECH COMMUNICATION
SPEECH AND
HEARING SCIENCES

PORTLAND
STATE
UNIVERSITY
P.O. BOX 751
PORTLAND, OREGON
97207
503/229-3533

Dear Parents,

We would like to invite you and your child to participate in a study of language development in toddlers. We hope to learn more about the age range that is normal for the beginning of speech and how children communicate in other ways during the toddler period. If you agree to join the study, you will be asked to bring your child to PSU for testing sessions every 6-12 months. At each session the child will be videotaped playing with you and some toys. We will ask the child to identify some pictures and act out some instructions with toys (such as "Push the car.") In addition we will ask you to answer some questions about the child's social and self-help skills. All parents participating will receive counseling and a list of suggestions for fostering language growth in children under three years of age. The potential benefits of the study are some help for you with stimulating language in your child. In addition, any child who reaches age three and appears to be having problems with language-learning can be referred for services in our clinic or elsewhere.

If you decide not to participate, of course the services you receive from your child's pediatrician, PSU, or any other agency will not be affected. If you decide to join the study you may withdraw at any time.

All results of your child's evaluations will remain strictly confidential. However, if you would like them to be communicated to your pediatrician or anyone else, we will be glad to do so. There will be no charge for any work done with you or your child as part of this study.

If you have any questions, please do not hesitate to ask them, or to call me at 229-3533. Thank you for your help.

Yours,

[redacted]

Rhea Paul, Ph.D., CCC-SPL
Assistant Professor

I (do) (do not) give permission for my child, _____,
to participate in the study described above.

_____ _____
Date Signature

I (do) (do not) give permission to show my child's videotapes for teaching or professional presentations only. I realize full names will not be used in any such presentations.

_____
Signature

APPENDIX D

CODING FORM

COMMUNICATION INTENTIONS - CODING

NAME _____ CODER _____
AGE _____ DATE OF CODING _____
SUBJECT # _____ TOTAL INTENTIONS _____
INTENTIONS PER MINUTE _____ TOTAL TYPES _____

	GESTURE	VOCAL.	GEST+ VOCAL	WORD COMBO	WORD
REQUEST ACTION					
REQUEST OBJECT					
PROTEST					
REQUEST SOCIAL ROUTINE					
GREETING					
SHOWING OFF					
CALLING					
REQUEST PERMIS.					
ACKNOW.					
COMMENT					
REQUEST INFO.					
REQUEST CLARIFI.					

APPENDIX E

CODING INSTRUCTIONS

INSTRUCTIONS FOR CODING COMMUNICATION INTENTIONS

The following definitions of terms will be used in coding of intentions.

Modes Of Communication

1. Gesture. Intentional behavior used to convey a message consisting of head nods, pointing, foot stomping, pushing away, touching, handing an item to parent. (N.B. Giving in and of itself does not constitute an intent to communicate. The intent must be determined by the context and the response of the parent.)

2. Vocalizations. Intentional behavior used to convey a message using phonetically consistent forms or sounds that are not recognizable words but are obviously communicative intentions because of meeting criteria listed below. This group may include unintelligible single words or word combinations.

3. Gesture Plus Vocalization. Intentional behavior in which gesture and vocalization, as defined above, are present simultaneously.

4. One Word. Intelligible single words directed to the parent. "Oh-Oh", "Wow", and animal sounds are not to be coded as single words but rather as vocalizations.

5. Word Combination. Two or more intelligible words directed to the parent. Simple repetitions of the same words such as "doggy, doggy" will not be coded as word combinations, but rather as one word utterances.

Communication Intentions

6. Request For Object. The child requests an object from the parent using any one of the five forms.

7. Request for action. The child directs the request to the parent in order to accomplish an action. The child must in some form request the parent to intervene. Simply struggling to do something does not constitute a request for action.

8. Protest. Behavior must be directed to the parent. Child may simply push the parent's hand away. He may turn away from the parent, use head nods, whine, fuss or use verbal protest such as "no" or "don't".

9. Request for social routine. Child attempts to engage the parent in simple interactional routines such as patty cake, itsy bitsy spider, peek-a-boo, etc.

10. Greeting. The child directs social greetings such as "Hi", "Bye-Bye" or "night-night" to the parent. Greetings directed to dolls or other toys or involving the play telephone and a person not present will not be counted.

11. Showing Off. The child uses behaviors to get and/or maintain the parent's attention.

12. Calling. The child attempts to get parent's attention usually through words such as "Mommy" or "Look, Mommy". NOTE: In coding the showing off and calling, only use one, not both intentions for the same event if the

child calls to parent to get their attention and then does something to show off. Showing off will be coded when the parent is not addressed and only the action is intended to get the parent's attention.

13. Request for permission. The child directs a request for permission to the parent through a two tier gaze (moving gaze from parent or object to object or parent), or through gestures, vocalizations, words or combinations of these forms.

14. Acknowledgement. The child indicates in some form that he has received the message the parent delivered. This may consist of imitation or repetition of part or all of the parent's statement or request. The child may mimic vocal intonation patterns without words or may use head nods. Do not code answers to direct questions such as "Do you understand?" or "Can you do this?"

15. Comment. The child remarks about some aspect of his environment using any of the five forms of communication previously defined. Comments are directed to the parent and not toys or objects.

16. Request for information Child directs a request to the parent for information, usually in the form of word combinations such as, "What's this?", "Where this go?"

17. Request for clarification. The child directs a request to the parent for additional information or repetition of previous statement. Child may use "What?" or "Huh?"

RULES FOR CODING INTENTIONS

1. The video tape may be viewed as many times as the coder wishes. The video tape is to be viewed once in its entirety prior to coding in order to get an overview of the communication style of the child and once in its entirety following the coding procedure in order to check that intentions have been accurately recorded. Individual sections of the tape may be viewed repeatedly until the coder believes she has accurately recorded all intentions.
2. Because it is essential that over assignment of intention to the child's behavior be avoided, DO NOT CODE any behavior about which a question exists concerning intentionality.
3. Establishment of joint attention between parent and child is required to code behaviors. Joint attention may be established through gaze, gesture, touch, proximity or calling directed to the parent prior to, or after the intentional behavior occurs. These behaviors need not be present if the child and parent are continuing in joint attentional behavior.

Although joint attention may be established through proximity, proximity is not an absolute prerequisite, nor does it imply joint attention in and of itself.

4. The parent need not respond to the child's intentional behavior in order to be coded.

5. Simple giving or showing an item to the parent will not be considered intentional behavior. Giving and showing will be coded as intentional when it is accompanied with directed gaze between parent and object, touching the parent, vocalization, persistent showing until the parent acknowledges the child or the object and/or indication that the parent interpreted the giving or showing as intentional behavior.

6. Non-directed functions WILL NOT BE CODED. Self-talk and talk directed toward inanimate objects will not be coded.

7. Code exactly ten minutes of interaction. Timing will be done during the initial viewing of the tape in its entirety.

8. When coding, note the location on the tape counter or each intentional behavior on the coding sheet.

APPENDIX F

SUBJECT DATA

DATA FROM NORMALLY DEVELOPING SUBJECTS IN THE THREE INTENTION GROUPS

Subject #	Regulatory	Social Interaction	Joint Attention
12	5	0	38
14	3	4	48
27	0	3	72
32	4	2	39
36	10	0	46
38	11	3	26
39	12	0	11
40	2	0	23
41	0	0	27
50	3	0	51
55	6	0	38
56	2	4	27
58	4	4	62
59	2	0	29
63	0	1	24
69	8	2	27
72	3	0	48
81	5	0	14
113	1	0	53
126	6	1	53
128	2	3	25
129	1	1	73
130	4	1	42
131	2	5	23
132	4	1	40
133	9	9	50
139	1	10	60
143	11	0	26
Total	121	54	1,095

DATA FROM EXPRESSIVELY DELAYED SUBJECTS IN THE THREE INTENTION CATEGORIES

Subject #	Regulatory	Social Interaction	Joint Attention
7	4	0	33
19	4	1	45
26	6	0	29
29	4	3	0
51	16	1	4
57	4	0	20
84	0	0	24
85	15	3	18
86	3	1	22
87	5	0	14
89	3	1	7
90	8	0	22
91	6	0	12
92	0	1	16
93	7	1	17
94	5	0	47
98	1	0	16
100	12	2	24
101	4	1	35
103	5	0	24
107	1	3	4
109	7	0	21
111	14	0	20
114	18	4	11
119	3	1	33
122	0	3	33
142	6	0	39
145	1	0	22
Totals	162	26	617

TOTAL NUMBER OF INTENTIONS, INTENTIONS PER MINUTE AND NUMBER OF DIFFERENT INTENTIONS EXPRESSED BY THE NORMALLY DEVELOPING AND ELD GROUPS

Normal			Delayed		
Total	Per Min.	Diff.	Total	Per Min.	Diff.
43	4.3	4	37	4.0*	4
55	5.5	5	50	5.0	7
75	7.5	5	35	3.5	5
45	4.5	6	7	.7	3
56	5.6	6	26	2.6	4
40	4.0	7	24	2.4	5
23	2.3	3	24	2.4	1
25	2.5	4	36	3.6	7
27	2.7	1	26	2.6	4
54	5.4	4	19	1.9	3
44	4.4	4	11	1.1	5
33	3.3	6	30	3.0	3
70	7.0	6	18	1.8	4
31	3.1	5	17	1.9*	3
25	2.5	2	25	2.5	4
37	3.7	5	52	5.2	4
51	5.1	5	17	1.7	2
19	1.9	3	38	3.8	7
54	5.4	4	40	4.0	5
60	6.0	5	29	2.9	4
30	3.0	7	8	.8	3
75	7.5	5	28	2.8	5
47	4.7	6	34	3.4	5
30	3.0	7	33	3.3	5
45	4.5	4	37	3.7	4
69	6.8	9	36	3.6	4
71	7.1	4	45	4.5	3
37	3.7	2	23	2.3	3
1,095			805		

* Intentions per minute calculated on slightly less than ten minutes of interaction.

DATA FOR THE FIVE MODES OF COMMUNICATION USED BY EACH OF THE EXPRESSIVE LANGUAGE DELAYED SUBJECTS

Subject Number	Gesture	Vocal-ization	Gest.+ Vocal.	Single Word	Word Combo.
7	0	21	16	0	0
19	0	18	0	18	14
26	1	8	3	6	17
29	5	1	0	1	0
51	0	8	17	1	0
57	11	4	9	0	0
84	0	11	13	0	0
85	0	13	4	18	1
86	1	23	1	1	0
87	2	10	4	3	0
89	0	6	0	1	4
90	2	22	2	2	2
91	4	8	5	1	0
92	2	7	5	3	0
93	2	17	4	2	0
94	2	16	5	9	20
98	3	10	1	3	0
100	0	12	13	13	0
101	0	10	1	3	26
103	2	14	7	6	0
107	2	3	3	0	0
109	5	12	10	1	0
111	3	9	21	1	0
114	3	8	16	6	0
119	2	21	12	2	0
122	0	16	3	13	4
142	0	32	4	8	1
145	2	10	1	8	2
	54	350	180	130	91

DATA FOR THE FIVE MODES OF COMMUNICATION
USED BY EACH OF THE NORMALLY
DEVELOPING SUBJECTS

Subject Number	Gesture	Vocal-ization	Gest. + Vocal.	Single Word	Word Combo.
12	1	28	11	3	0
14	0	19	0	27	10
27	0	3	0	8	64
32	0	4	1	3	37
36	0	7	0	10	39
38	4	14	6	16	0
39	3	8	6	6	0
40	0	2	6	6	11
41	0	16	7	4	0
50	0	10	0	16	28
55	0	0	0	7	37
56	0	5	0	3	25
58	1	0	0	4	65
59	2	0	0	15	14
63	0	15	0	10	0
69	0	27	7	3	0
72	0	28	3	19	1
81	1	1	0	2	15
113	0	0	0	1	53
126	0	0	0	3	57
128	0	0	0	8	22
129	0	3	0	7	65
130	0	0	0	13	34
131	0	2	3	9	16
132	0	12	27	6	0
133	0	3	0	8	57
139	0	10	0	10	51
143	0	3	0	2	32
Totals	12	219	77	229	733