THE COMMUNICATIVE PERFORMANCE OF NONSPEAKING ADOLESCENTS ACROSS VARIOUS PARTICIPANT INTERACTIONS

by

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

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Chapter I

Introduction

Pragmatics, the use of language in social context (Bates, 1976), has been an area of recent investigation in the field of augmentative communication. For the nonspeaking person, an augmentative communication system, specifically involving a communication board, provides him/her with the opportunity for using language in a variety of social interactions. The question of how competently the nonspeaking person uses his/her language, however, remains largely unexplored.

To date, four published studies have focused on the nonspeaking person's use of his/her communication board in social context with various adults including teachers/clinicians and primary caregivers (Calculator & Dollaghan, 1982; Calculator & Luchko, 1983; Harris, 1982; Light, Collier, & Parnes, 1985). These studies indicated that nonspeaking persons infrequently used their communication boards and rarely initiated topics when interacting with adults. The nonspeaking person primarily assumed a responding role. Although references to the communication board user's peer interactions skills were made, none of the studies systematically analyzed these skills.

According to Gallagher (1983), language usage is dependent upon the context. The communicative partner is an important component of the context in that an individual's

communicative performance varies depending upon the partners involved (Ervin-Tripp, 1976). In fact, several studies have indicated that normal-language learning children's speech to peers differs from their speech to adults both with respect to the pragmatic skills displayed and the syntactic structures produced (Martlew, Connolly, & McCleod, 1976; Sachs & Devin, 1976; Shatz & Gelman, 1974; Wellman & Lempers, 1977; Wilkinson, Hiebert, & Rembold, 1981). Other studies have indicated that the language production of language-disordered children also is modified when interacting with a peer versus an adult, and also when interacting with different peer groups (Fey & Leonard, 1984; Fey, Leonard, & Wilcox, 1981; Nisbet, Zanella, & Miller, 1984; VanKleek & Frankel, 1981;). An investigation, therefore, of the peer interactions skills possessed by the augmentative communication user is warranted in order to provide a more complete picture of his/her communicative performance.

The purpose of this study was to examine the communicative performance of nonspeaking adolescents across participant interactions involving a teacher, a speaking peer, and a nonspeaking peer in both a spontaneous and elicited situation. Specifically, in terms of the nonspeaking person across interactions examined, the questions of this study were:

1. What are modes of communication exhibited?
2. What are the communication functions expressed?

3. What is the role of the communicator?

Chapter II

Review of Literature

Pragmatics, the use of language in social context (Bates, 1976), has been an area of recent investigation in the field of augmentative communication. For the nonspeaking person, an augmentative communication system, specifically involving a communication board, provides him/her with the opportunity for using language in a variety of social interactions. (See Appendix A for specific information concerning the selection and development of augmentative communication systems involving communication boards.) The question of how competently the nonspeaking person uses his/her language, however, remains largely unexplored.

The Communication Board User's Interaction Skills with 'Significant Other' Adults

To date, four published studies have focused on the nonspeaking person's use of his/her communication board in social context with various adults. Harris (1978) observed communicative interactions involving three nonspeaking, nonambulatory cerebral-palsied children, 6 to 7 years of age, and their teachers during three major classroom contexts: free-time activity, individualized instruction, and small group instruction/discussion. The analyses of the interactions focused on the manner and extent to which the children and the teachers participated in communicative events within the classroom. The results indicated that

the communicative interactions in all contexts were dominated by the teachers who contributed a greater number of turns to the communicative exchanges and who exhibited a greater number of topic initiations than the children. The children primarily occupied the respondent role. With respect to communication mode, the children primarily used those modes that were faster to produce although more likely to create ambiguous messages (e.g., gestures and pointing paired with vocalizations). Use of communication boards by the children was infrequent. Because the observations were made during classroom activities when other class members were present, the investigator was able to conduct an informal observation in regard to peer interaction. Children were rarely observed interacting with peers or other persons besides the teachers in any of the contexts. Harris stated that this lack of peer interaction may have been the result of discrepant communication skills between the child and his/her peer or a result of the child's primary reliance on communicating with adults. Because of the structure of classrooms, however, it may be natural to expect the child to interact more with the teacher than his peers (Bloome & Knott, 1985).

Another study focusing on the communication board user's interaction skills with teachers was conducted by Calculator and Dollaghan (1982). Seven, nonambulatory, nonspeaking, mentally-retarded students, 8 to 25 years of age, interacted with their teachers in a classroom setting. Each subject and

teacher was videotaped for a 30-minute period during the opening segment of the subject's school day. The speaker role, the mode of communication, and the outcome of the subjects' messages were examined. The results revealed that the students occupied the respondent role nearly three times as frequently as the initiator role. In addition, the students preferred nonboard modes in producing messages although these modes were previously judged nonfunctional for the student. The students rarely used their communication boards to produce message units, indicating that the boards did not assist in their communicative competence. The teachers, however, responded to the subjects' board productions more frequently than other communication modes (e.g., gestures and vocalizations).

Light, Collier, and Parnes (1985) examined the communicative patterns of eight congenitally, nonspeaking, physically-disabled children between the ages of four and six years in two different adult interactions. Specifically, the subjects were videotaped interacting with their primary caregivers in a free-play situation, and with a trained clinician in a series of structured play contexts. Analyses of the interactions focused on the subjects' discourse patterns and communicative functions. The results indicated that both the subjects and their caregivers contributed to maintaining the communicative exchanges. The caregivers, however, controlled the exchanges by occupying more

conversational space and initiating more topics than the children. The children occupied the respondent role in that they primarily produced yes/no responses or provided specific information requested by their caregivers. The children did, however, produce a greater variety of communicative functions in the structured contexts with the clinician than in the free-play interaction with the primary caregiver.

In a study conducted by Calculator and Luchko (1983), the effects of various aspects of treatment on the communicative effectiveness of a 24-year-old nonspeaking woman using her communication board in natural settings with primary caregivers were examined. A communication board program consisting of five phases was developed: a baseline phase with the original communication board; three training phases involving the subject's use of a revised communication board; and a training phase for the staff personnel in procedures for appropriately interacting with the subject. The results indicated that the training program was effective in that the subject, with the use of her revised board, increased her likelihood of responding to the staff personnel's messages along with an increased use of both her board and nonboard modes of communication. Most of the subject's interactions were with the staff personnel who had been trained in how to interact with the subject. Less than five percent of the subject's interactions were with the other residents who had not received any type of formal training in the use of her

board. From the findings, the investigators contended that during naturally occurring interactions, the subject was either being placed in or else was voluntarily assuming a more passive role.

In summary, the pragmatic studies conducted thus far have focused on the communicative effectiveness of the communication board user in his/her interactions with teachers/clinicians or primary caregivers. Although references to the communication board user's peer interaction skills were made, none of the studies systematically analyzed these skills. According to Gallagher (1983), language usage is dependent upon the context. The communicative partner is an important component of the context in that an individual's communicative performance varies depending upon the partners involved (Ervin-Tripp, 1976). In fact, several studies have indicated that normal-language learning children's speech to peers differs from their speech to adults both with respect to the pragmatic skills displayed and the syntactic structures produced.

Normal-Language Learning Children's Interaction Skills with Adults Versus Peers

In interactions involving normal-language learning children with adults versus peers, several studies have examined differences in amount of communicative exchanges and/or communication function usage. Wellman and Lempers (1977) examined the naturalistic communicative abilities of

ten children, 2.2 to 3.0 years of age, interacting with teachers and peers in a toddler play group or a preschool class. The results indicated that the children communicated with other communicative partners approximately 80 percent of the time, and that they changed their messages in response to the needs of the listener and the situation (e.g., when the listener understood, did not understand, or ignored the message). Although the children included peers in communicative exchanges, they primarily communicated with teachers. The investigators concluded that children of two years of age possess some communicative competence.

Wilkinson, Hiebert, and Rembold (1981) examined eighteen 2.5-year-old children interacting separately with their mother, their father, and a slightly older peer (33 to 42 months of age) during a play situation in the child's home. Analyses of these interactions revealed that the children's communicative style changed according to the communicative partner (parent or peer) with respect to the number of utterances produced, the number of turns, the mean length of utterance (MLU), questions, answers, and polite directives. The subjects produced more utterances and turns per minute while interacting with their mother or father than with a peer. When interacting with a peer, the subjects' MLU was slightly smaller than when interacting with a parent. Questions, answers, and polite directives occurred more frequently in the mother and father interactions than in the

peer interactions.

Another study focusing on the communication functions used by slightly older children in various interactions was conducted by Sachs and Devin (1976). Observations were made of four children, 3.9 to 5.5 years of age, communicating in the following five situations: talking to their mothers, to peers, to babies (1.2 to 2.5 years of age), to baby dolls, and pretending that they themselves were babies. Analyses of the children's speech across the five situations indicated that the children spoke differently to their mothers than to their peers or younger listeners. Questions were produced more frequently by the children when they communicated to the mothers than when they communicated with peers or younger listeners. Also, the types of questions used by the subjects were related to the listener involved. Questions addressed to the mother or peer requested information concerning the external world, while questions addressed to the baby requested information concerning his/her internal state. When speaking to younger listeners, the children's speech was similar to a mother's speech to a child. The investigators suggested that a sample of the child's language should not be viewed only by his/her grammatical constructions. The communication characteristics of the situation, including the communication participant, should also be considered in the analysis.

Martlew, Connolly, and McCleod (1976) investigated the

language use and role-playing of a five-year-old male child playing alone, playing with a friend of the same age, and playing with his mother. The results indicated that the child modified his language productions depending upon his expectations of the social interactions of his communicative partner. The child produced longer utterances while talking with his mother than with his peer. In the interaction with his mother, the majority of the child's utterances consisted of responses to questions. In contrast, while interacting with his peer, the child produced more word commands or expletives (e.g., "Don't", "Silly", "Pigs").

Finally, in a study focusing on the use of syntactic structures and attention getting devices, Shatz and Gelman (1974) investigated the language productions of four-year-old children while communicating with adults and while communicating with two-year-olds in two different situations. In one situation, the children were told to talk about a specific toy while communicating with the other participant. In the other situation, the children were allowed to play and communicate freely. Results indicated that the four-year-olds produced shorter sentences, fewer complex syntactic constructions, and used more attention-getting devices when speaking to two-year-olds than they did when speaking to adults. The investigators stated that these same speech modifications are found in mothers' speech to young children. More specific findings indicated that the

rate of occurrence of some constructions varied depending on the situation. For example, in the structured situation with two-year-olds, "that" predicate complementation (e.g., "I know that it is an elephant.") rarely occurred. In contrast, the frequency of this complementation increased in the two-year-old unstructured situation and decreased in the same situation with the adults.

These studies indicated that normal-language learning children spontaneously modify their language production when interacting with a peer versus an adult. Relatively few studies have examined the language modifications of various groups of language-disordered children.

Language Modifications of Language-Disordered Children

Three studies have examined the communicative performance of specifically language-impaired children in various interactions. Fey and Leonard (1984) examined the conversational performance of specifically language-impaired and normal-language children across dyadic interactions with an adult partner, a same-aged partner, and a toddler partner. The following variables were measured across all interactions: ratio of speaker/partner utterances, rate of production of utterances, acknowledgments, contingent queries, questions, imperatives, self-repetitions, internal state questions, mean length of utterance, and mean preverb length. The results indicated that the specifically language-impaired children modified their communication style

according to the communicative partner similarly to the normal-language children with respect to all variables measured except use of internal state questions, mean length of utterance, and mean preverb length. The specifically language-impaired children were as assertive in the communication exchanges as the normal-language children and, in fact, they occasionally modified their language productions to match age-related characteristics of the partner better than the normal-language children.

Van Kleek and Frankel (1981) analyzed language samples of three language-disordered children between the ages of 3.1 to 4.2 years with mean length of utterance ranging from 1.8 to 3.2. Two language samples were collected for each subject: one sample while the subject was interacting with his/her mother during an unstructured play situation, and the other sample while the subject was interacting with a peer of approximately the same age also in an unstructured play situation. The authors analyzed the use of focus (repetition) and substitution operations (repetition and alteration of a previous utterance in some manner) as devices for maintaining the ongoing discourse. The results indicated that all three language-disordered children were able to use both focus and substitution operations to maintain discourse in both the interaction with the mother and with the peer. The investigators suggested that language-disordered children are not qualitatively different from normally developing

children in their ability to use these devices for learning to participate in conversations.

The communicative performance of specifically language-impaired children has also been examined with different groups of peers. Fey, Leonard, and Wilcox, (1981) selected six language-impaired children ranging in age from 4.3 to 6.5 years with a mean length of utterance (MLU) greater than 3.0. These subjects were observed interacting in two dyadic contexts: with normal-language children of similar chronological ages, and with normal-language children who were younger but exhibited similar MLUs. The findings of the study showed that the language-impaired children made similar modifications in their language productions when interacting with both groups of peers as do normal-language children. Low mean pre-verb length (mean number of morphemes before the main verb in each clause), conversational assertiveness, and internal-state questions occurred more frequently in the MLU-matched condition than in the age-matched condition.

Focusing on a different population, Nisbet, Zanella, and Miller (1984) examined the peer conversational skills of three Down's syndrome, moderately-handicapped subjects, ranging in age from 12 to 15 years. The subjects were observed interacting with each other and with a nonhandicapped peer in their classroom during a popcorn activity. Across subjects, the analyses of the interactions included measurements of topic duration and amount of

talking. The results of the study indicated that the total duration of initiated topics and the average duration per topic were not different when the handicapped students interacted with each other versus when they interacted with the nonhandicapped student. Two of the handicapped students spent less time talking to each other than when talking to a nonhandicapped peer.

In summary, studies have indicated that the language production of both normal and language-disordered children is modified when interacting with a peer versus an adult, and also when interacting with different peer groups. An investigation of the peer interaction skills possessed by the augmentative communication user is warranted in order to provide a more complete picture of his/her communicative performance.

Statement of Purpose

The purpose of this study was to examine the communicative performance of nonspeaking adolescents across participant interactions involving a teacher, a speaking peer, and a nonspeaking peer in both a spontaneous and elicited situation. Specifically, in terms of the nonspeaking person across interactions examined, the questions of this study were:

1. What are the modes of communication exhibited?
2. What are the communication functions expressed?
3. What is the role of the communicator?

Chapter III

Method

Subjects

Four adolescents, two males and two females, selected from a residential school for individuals with muscular disabilities, were used as subjects in this study. The subjects ranged in age from 14.9 to 18.6 years, with standardized IQ scores ranging from 31 to 53. Each subject had attended the school for a minimum of seven years (see Table 1). Criteria for subject selection were that the individual:

1. be nonspeaking, operationally defined as an individual for whom speech is adequate to meet some (e.g., yes/no responses) but not "all of his or her communication needs, and whose inability to speak is not due primarily to a hearing impairment" (American Speech and Hearing Association, 1980, p. 268);
2. be functioning in Piaget's (1964) preoperational period (see Table 2) of cognitive development (Calculator & Dollaghan, 1982);
3. possess a language comprehension level approximately equivalent to his/her cognitive level of development (see Table 3);
4. use a communication board involving a minimum of 25 symbols (Calculator & Dollaghan, 1982) developed by the school, and consisting of either cartoon-like

Table 1

Subject Description: Sex, Chronological Age (CA), Etiology, Standardized IQ Scores, and School Attendance

Subject	Sex	CA (years)	Etiology	IQ Score (Full Scale)	School Attendance (years)
A	Male	14.9	Cerebrovascular accident in infancy	46[a]	13
B	Female	18.6	Spastic paraplegic cerebral palsy	53[b]	14
C	Male	15.7	Spastic diplegic cerebral palsy with severe seizure disorder	31[c]	7
D	Female	17.4	Severe athetoid quadriplegic cerebral palsy	--[d]	11

[a] Measured with the *French Pictorial Test of Intelligence* (French, 1964). [b] Measured with the *Wechsler Adult Intelligence Scale* (Wechsler, 1955). [c] Measured with the *French Pictorial Test of Intelligence*. [d] Standardized IQ score not available for this subject.

Table 2

Cognitive Levels Of Development Across Piagetian Tasks For Each Subject

Subject	Seriation	Classification		Drawing
		Free Sorting	Dichotomies	
A	E-M	E	E-M	M
B	L	M-L	E-M	M
C	E-M	M-L	E-M	M
D	E-M	M-L	E-M	--[a]

Note. E=Early preoperations (2.1 to 4 years); M=Middle preoperations (4.1 to 5.6 years); L=Late preoperations (5.7 to 7 years); C=Concrete operations (7 to 12 years); NM=Task not mastered.

[a] -- Unable to assess drawing skills due to subject's limited motor ability.

(table continues)

Subject	Transitivity		Conservation			
			Identity Format		Equivalence Format	
	Length	Weight	Length	Weight	Length	Weight
A	NM	NM	NM	NM	NM	NM
B	NM	NM	NM	NM	NM	NM
C	C	C	NM	NM	NM	NM
D	NM	NM	NM	NM	NM	NM

(table continues)

Subject	1:1 Correspondence	Number 1:1 Non-Complimentary Sets	Conservation
A	C	M	NM
B	C	C	NM
C	C	M	NM
D	C	M	NM

Table 3

Language Comprehension Levels of Development for Each Subject

Subject	M-Y Test (Total score age level in years)	PPVT (Age equivalent score in years)	Comprehension of symbols on communication board
A	4 to 5	9.7	yes
B	4 to 5	5.7	yes
C	3 to 4	6.1	yes
D	4 to 5	8.4	yes

Note. M-Y Test=*The Miller-Yoder Test of Comprehension*; PPVT=Form L of the *Revised Peabody Picture Vocabulary Test*.

pictures with the corresponding English orthographic symbol written below each picture or only the English orthographic symbol (see Table 4);

5. use a communication board involving a direct selection system which requires the communication board user to point in some manner to each symbol in order to encode his/her message;
6. demonstrate the ability to use his/her communication board as verified by a certified speech-language pathologist at the school; and
7. possess visual and auditory abilities within normal limits.

With regard to the above criteria, informal Piagetian tasks (Bedrosian, 1981; Dihoff, 1976; Gill, 1979) were employed to assess each subject's cognitive level of development. The following areas were assessed: seriation, classification (free sorting and dichotomies), drawing, number (1:1 correspondence of complimentary and non-complimentary sets, and conversation), and conservation and transitivity of length and weight.

Three procedures were used for assessing various areas of language comprehension. The Miller-Yoder Language Comprehension Test (Miller & Yoder, 1984) was administered to assess each subject's comprehension of the following grammatical forms: active, preposition, possessive, negative/affirmative, pronoun, singular/plural, verb

Table 4

Language Production Status For Each Subject

Subject	Type of Symbol System	Number of Symbols on Board	Communication Notebook	Range of Symbol Production
A	Cartoon-like pictures with English orthographic symbols	185 symbols plus English alphabet and numbers 0 to 9	31 pages; range of 1 to 35 symbols per page	1 to 4
B	English orthographic symbols	242 symbols plus English alphabet and numbers 0 to 9	no notebook	1 to 5
C	Cartoon-like pictures with English orthographic symbols; and sign language	165 symbols plus English alphabet and numbers 0 to 9	18 pages; range of 4 to 35 symbols per page	1 to 4
D	Cartoon-like pictures with English orthographic symbols	152 symbols	35 pages; range of 3 to 26 symbols per page	1 to 5

inflection, modification, passive, and reflexivization. In order to assess each subject's comprehension of vocabulary, The Revised Peabody Picture Vocabulary Test, Form L, (Dunn & Dunn, 1981) was administered. An informal assessment of each subject's comprehension of the symbols on his/her communication board was also conducted by requiring the subject to point to the correct symbol named. (Specific data for each subject are reported in Appendix B.)

Data Collection:

For each subject, a 15-minute videotaped recording was made of his/her communicative performance in each of the following participant interactions: subject-teacher, subject-speaking peer, subject-nonspeaking peer (spontaneous) and subject-nonspeaking peer (elicited). All interactions were videotaped through a one-way mirror in a speech-language therapy room at the school. A video camera (portable Panasonic PK-958) was placed behind the mirror.

For each interaction, the investigator seated the participants. During the subject-teacher interaction, the subject was seated at a 90 degree angle to the mirror. During the other interactions, the communication participants were seated at 45 degree angles to the mirror in order that their communication boards were clearly visible to the camera and to each other. With the help of an assistant, videotaping began as soon as the investigator departed from the speech-language therapy room. The subjects, speaking peers, and the

nonspeaking peers were unaware that they were being videotaped. Specific procedures for each interaction were as follows:

Subject-teacher. Each subject was observed interacting with his/her classroom teacher in an academic activity requiring individual instruction from the teacher. Each teacher was informed that the purpose of the study was to examine the subject's communicative performance. The teachers were instructed to interact with the subjects as normally as possible. Because Subjects C and D were enrolled in the same classroom, each interacted with the same teacher (see Table 5).

Subject-speaking peer. A familiar peer, who could read as well as communicate functionally through verbal language, was selected to interact with each subject. As soon as the participants were seated,the following instructions were given by the investigator: "Today we're going to play a game. Oh I forgot something. I will be right back." Subjects A and B interacted with the same speaking peer, and Subjects C and D interacted with the same speaking peer (see Table 5).

Subject-nonspeaking peer (spontaneous). A familiar nonspeaking peer, who communicated with a similar augmentative communication system, was selected to interact with each subject. As soon as the participants were seated, the following instructions were given by the investigator:

Table 5

Subjects and Their Communicative Partners Across Interactions

Subject	Teacher	Speaking Peer	Nonspeaking Peer
A (M)	1 (F)	E (M)	Subject B
B (F)	2 (M)	E (M)	Subject A
C (M)	3 (F)	F (M)	Subject D
D (F)	3 (F)	F (M)	Subject C

Note. (F)=female; (M)=male.

"Today we're going to play a game. Oh I forgot something. I will be right back." Subject B was the nonspeaking peer for Subject A and vice versa. Also, Subject D was the nonspeaking peer for Subject C and vice versa (see Table 5). The rationale for having subjects interact with each other was based on the fact that no other nonspeaking persons at the school shared the same type of communication system.

Subject-nonspeaking peer (elicited). Each subject and the same nonspeaking peer were also observed in another situation. Because limited peer interaction has been reported in the literature (Calculator & Dollaghan, 1982; Calculator & Luchko, 1983; Harris, 1978), procedures were designed to elicit communicative interaction specifically involving requests for objects. Two cookies were placed in front of one participant and two glasses of water were placed in front of the other participant. The following instructions were given by the investigator: "Here are two cookies and here are two glasses of water. Oh I forgot something. I will be right back."

Across subjects, the order in which these interactions were videotaped was counterbalanced. The subject-nonspeaking peer spontaneous interaction was, however, always videotaped at some time prior to the elicited interaction involving the same participants. Observing the subjects' spontaneous communicative skills was desired before placing props in the room to facilitate/elicit communication. No more than

fourteen days (average of four days) elapsed between each interaction. All interactions were videotaped within an eighteen day period.

Data Transcription:

The videotapes from all interactions were transcribed by the investigator. Transcriptions for all of the participants (i.e., subjects, teachers, speaking peers, and nonspeaking peers) included contextual notes as well as communication board symbol production, verbalizations (i.e., any meaningful production), vocalizations (i.e., productions not involving morphemes), signs (for Subject C interactions), and gestures that displayed communicative intent (e.g., pointing, physical contact with other, and taking object from other).

Specifically, all communicative turns for each participant were transcribed. Communicative turns were operationally defined as communication board symbol, verbal, vocal, sign, and/or gestural possession of the floor. Within a turn, one or more message units were transcribed and segmented. Segmentation procedures for each type of message unit were as follows: A board symbol or signed message unit involved incomplete or complete grammatical structures displayed with the appropriate board or signed symbol(s). A message unit for verbal/vocal production involved a complete or incomplete utterance as defined by terminal intonation contour or pause time (Miller, 1981). A

gestural message unit involved either a single gesture displaying communicative intent, the repetition of the same gesture, or a sequence of two different gestures related to the same referent.

Data Analysis:

Data were coded according to the mode of communication, the communication function employed, and the role of the communicator. The mode of communication as well as the communication function were analyzed with respect to the message unit. The unit of analysis for the role of the communicator was the turn.

Mode of communication. Each message unit encoded by all the communication participants was classified according to the mode(s) used: use of one's own or other's communication board symbols, verbal, vocal, sign, and gesture (Calculator & Dollaghan, 1982; Calculator & Luchko, 1983; Harris, 1978).

Communication function. The communication function of each message unit produced by each subject and his/her respective communicative partners was coded. A communication function was often defined across one or more modes. The communication function categories and corresponding mode definitions were as follows:

1. Requests: The following requests were coded:
    a. Request for object: "Directs the listener to provide an object" (Calculator & Luchko, 1983, p. 187).

1. Verbal/Board: Produces symbol(s) verbally or on communication board that "directs the listener to furnish entity that is present in the immediate environment or to furnish entity not existent in the immediate environment" (Coggins, Carpenter, & Owings, 1983, p. 101). The request may be in the form of a question (e.g., "Will you give me the hat?") or command (e.g., "Give it to me").
2. Gestural: "Stretches hand toward entity or stretches hand toward entity with ritual gesture" (Coggins et al., 1983, p. 101).

b. Request for action: "Directs the listener to initiate, continue, or terminate a particular action" (Calculator & Luchko, 1983, p. 187).
   1. Verbal/Board: Produces symbol(s) verbally or on communication board requesting a particular action to be initiated, continued, or terminated. The request may be in the form of a question (e.g., "Would you go back to class?") or command (e.g., "Say it again").
   2. Gestural: Reaches or points toward entity that has ceased moving, has the potential to move or be moved; or leans toward entity (Coggins et al., 1983).

c. Request for information: "Seeks information about an object, person, action, or location" (Calculator &

Luchko, 1983, p. 187) verbally or by indicating the appropriate symbol(s) on his/her communication board. The request was in the form of a question (e.g., "And what did he find on his walk?").

d. Request for permission: Seeks the right to do or encode something from the listener verbally or by indicating the appropriate symbol(s) on his/her communication board (e.g., "Can I look at your notebook?").

e. Request for attention: Requests attention from the listener.

   1. Verbal: Requests attention from the listener verbally (e.g., "Look" or "See?") or by indicating the appropriate symbol(s) on his/her communication board.

   2. Gestural: Taps on the listener's shoulder, arm, hand, wheelchair, or on the table in front of the listener in order to request attention from that participant; or points to, displays, or gives an object to the listener so that the he/she will attend to the object.

   3. Vocal: Requests attention from the listener vocally (e.g., "Uh-Uh-Uh").

f. Request for repair: Seeks repair of the preceding message unit.

   1. Verbal/Board: Seeks clarification (e.g., "Eleven

what?"), confirmation (e.g., "He did?" or "Really?"), or repetition (e.g., "What?", "Huh?", or "Hmm?") of the preceding message unit verbally or by indicating the appropriate symbol(s) on his/her communication board.

2. Gestural: Displays look of confusion on his/her face, and/or shrugs his/her shoulders in response to a declarative/informative message unit.

g. Indirect request: "A statement to oneself or the listener serving as an expression of need or desire" (e.g., "I want you to tell me" or "Let's see") (Wanska & Bedrosian,in press, p. 9). This communicative function was coded only at the symbol level.

2. Response to requests: "Complies with a partner's request for information, object, or action" (Calculator & Luchko, 1983, p. 187).

a. Verbal/Board: Responds by complying to the communication participant's request for information, object, or action,where the answer is or is not visually apparent in the immediate environment with a verbal response or by indicating the appropriate symbol(s) on his/her communication board (Coggins et al., 1983).

b. Gestural: Responds by complying to the communication partner's request for information, object, or action,

with a head nod or provides obligatory gestural response to the communication partner's request where the answer is or is not visually apparent in the immediate environment (Coggins et al., 1983).

3. Protest/Disagreement: "Expresses disapproval or disagreement of the speaker's action or utterance" (Coggins et al., 1983, p. 101).
   a. Verbal/Board: Responds to the communication participant's request for action, permission, or statement with negative verbal response or by indicating the appropriate symbols on his/her communication board (e.g., "No") (Coggins et al., 1983).
   b. Gestural: "Shakes head from side to side, pushes other communication participant's hand aside, turns away from the other communication participant, strikes out at the other communication participant, or uses a ritualized gesture to indicate disapproval or disagreement (e.g., shaking head from side to side or pulling communication board away) or to reject or decline an activity initiated by the other communication participant" (Coggins et al., 1983, p. 101).
4. Repetition: Repeats exactly the form of a message unit used by the other participant in the previous turn (Calculator & Luchko, 1983).

a. Verbal/Board: Repeats exactly the form of the symbol message unit used in the previous turn by the other communication participant verbally or by indicating the appropriate symbol(s) on his/her communication board.

b. Gestural: Repeats the exact form of a gestural message unit used in the previous turn by the other communication participant.

5. Self-Repetition: Repeats exactly the form of his/her own message unit produced in the same turn.

a. Verbal/Board: Repeats exactly the form of his/her own preceding message unit produced in the same turn verbally or by indicating the appropriate symbols on his/her communication board.

b. Gestural: Repeats the exact form of his/her preceding gesture used in the same turn.

6. Acknowledgement: Any message unit recognizing the fact that the previous speaker has said or done something.

a. Verbal/Board: Verbally recognizes (e.g., "O.K.," "Yeah", "Uh-huh") or by indicating the appropriate symbols on his/her communication board the fact that the other communication participant has said or done something.

b. Gestural: Nods head to recognize the fact that the other communication participant has said or done something.

7. Informative: Any declarative statement produced verbally or by indicating the appropriate symbols on his/her communication board "which contains information about the acknowledged topic...provides information to the other communication participant or to comment on ongoing interaction" (e.g., "It was a green rock".) (Corsaro, 1974, p. 14).
8. Affection: Any gesture produced to communicate affection (e.g., kissing, holding hands).
9. Play: Any message unit produced for purposes of play.
   a. Verbal: Any recognizable word that is produced for play purposes (e.g., "I am I am").
   b. Gestural: Any gesture (e.g., clapping hands, snapping fingers, or ritualized gestures such as "give me five") that is produced for play purposes.
   c. Vocal: Any unmeaningful noises or sounds that are produced for play purposes (e.g., "Du di du du di du").
10. No Response: "Absence of a message following a communicator's having issued a request for which a response is obligatory" (Calculator & Luchko, 1983, p. 187). This function was coded only once following the last request in a series of consecutive requests.
11. Uncodable: Any message unit in which the communicative intent is either unclear or unintelligible. Also included in this definition is a message unit produced

verbally to fill a gap in the communication but is not produced for purposes of responding to a question or acknowledging that a statement has been produced (e.g., "Oh", "Huh", "Uh").

Combinations involving two or more of the above communication functions were also coded.

Communicator role. Depending on the topic, the communicators were classified as initiator, maintainer, both initiator and maintainer, consecutive initiator, or uncodable each time a communicative turn was exhibited. Topic was defined as "the distinction between new and old information within a communicative exchange" (Calculator & Dollaghan, 1982, p.282) and was coded across all modes. The specific definitions of the communicator roles were as follows:

1. Initiator: The individual who begins the communication through any of the modes previously described or "redirects its focus by changing the topic thereby assuming an active role in the conversation" (Calculator & Luchko, 1983, p.187).
2. Maintainer: The individual who actively follows the lead of the initiator as well as follows any subsequent turns related to the initiation of the communication.
3. Maintainer/Initiator: The individual who actively follows the lead of the initiator and, within the same turn, initiates a new topic.
4. Consecutive Initiator: Two different topics are

initiated within the same turn by the same communication participant.

5. Uncodable: Uncodable was assigned to a communicative turn when the entire turn was unintelligible or questionable.

Reliability

Ratings of interobserver reliability were obtained for both the data transcription and analysis procedures. Approximately 30% of the data was randomly selected and independently checked for transcription accuracy by a trained observer. The percentage of agreement between the investigator and the trained observer was 99.4%.

During training of the coding procedures for communication mode, function, and role, the investigator and the same observer coded approximately 20% of the data together. For reliability purposes, approximately 25% of the untrained data was randomly selected and independently coded for communication mode and function, while approximately 35% of the untrained data was randomly selected and independently coded for communicator role. Point-by-point percentage agreement (number of agreements/number of agreements + disagreements X 100) was calculated for each major area of analysis. For communication mode, percentages of agreement ranged from 94.5% to 100%, with a total mode agreement of 98.8% (see Table 6). Percentages of agreement for communication function ranged from 75% to 100%, with a total

Table 6

Percentage of Agreement for Communication Mode

Communication Mode	Percentage of Agreement
Board	100.0
Other's Board	100.0
Verbal	99.7
Vocal	96.7
Gesture	97.7
Sign	100.0
Combinations	94.5
Total Agreement for Mode	98.8

function agreement of 95.6% (see Table 7). Finally, for communicator role, percentage of agreement ranged from 81.3% to 95.1%, with a total role agreement of 93.1% (see Table 8).

Table 7

Percentage of Agreement for Communication Function

Communication Function	Percentage of Agreement
Request for Object	100.0
Request for Action	95.9
Request for Information	96.9
Request for Permission	100.0
Request for Attention	94.3
Request for Repair	93.9
Indirect Request	100.0
Response to Requests	97.7
Protest/Disagreement	100.0
Repetition	81.8
Self-Repetition	93.3
Acknowledgement	95.4
Informative	93.8
Play	100.0
Affection	100.0
No Response	100.0
Uncodable	97.7
Combinations	75.0
Total Agreement for Functions	95.6

Table 8

Percentage of Agreement for Communicator Role

Communicator Role	Percentage of Agreement
Initiator	82.4[a]
Maintainer	95.1
Uncodable	81.3
Total Agreement for Role	93.1

[a] Percentage of agreement calculated for total number of initiations included in the roles of initiator, maintainer/initiator, and consecutive initiator.

Chapter IV

Results

The communication modes and functions produced, and the communicator roles exhibited by all subjects and their communication partners were analyzed across the four participant interactions. The unit of analysis for communication mode and function was the message unit, and the turn was the unit of analysis for communicator role. The coding for communication mode and function involved a total frequency of 2904 and 2984 (including no responses) message units, respectively. For communicator role, a total frequency of 1669 turns was coded. Individual results for each subject and his/her respective communication partner are presented in Appendix C. Results across subjects will be presented here.

Communication Mode

Communication board usage occurred infrequently across interactions for all subjects, with the exception of Subject D (see Table 9). For Subject D, board usage was one of the primary communication modes exhibited in both the teacher and speaking peer interactions, although no board usage was exhibited in the nonspeaking peer interactions (see Figure 1). Each subject did, however, use his/her board more frequently in one of the peer interactions than in the teacher interaction. In terms of the specific peer interactions, Subjects A and B used their boards more

Table 9

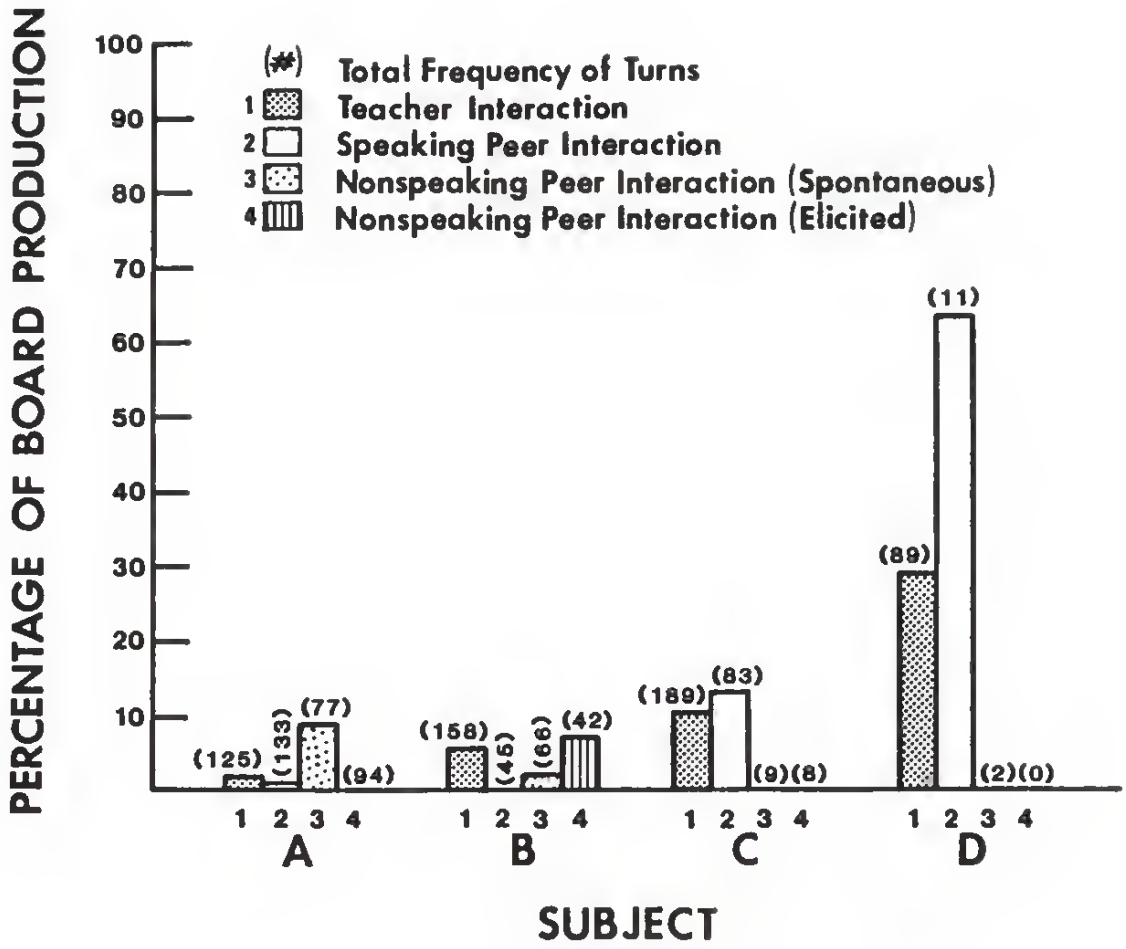
Percentage of Communication Modes For Each Subject Across Interactions

Communication Mode	Participant Interaction: Teacher Subject				Speaking Peer Subject				Nonspeaking Peer: Spontaneous Subject				Nonspeaking Peer: Elicited Subject			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
Board	1.6	5.1	10.1	29.2	0.8	0.0	13.3	63.6	9.1	1.7	0.0	0.0	0.0	7.1	0.0	0.0
Other's Board	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	1.7	0.0	0.0	1.1	0.0	0.0	0.0
Verbal	84.0	54.4	31.2	13.5	68.4	40.0	42.2	18.2	29.9	38.3	44.4	50.0	42.6	45.2	33.3	0.0
Vocal	2.4	3.8	2.1	13.5	4.5	0.0	1.2	9.1	0.0	0.0	11.1	50.0	1.1	0.0	50.0	0.0
Gesture	4.0	9.5	22.8	32.6	9.8	57.8	1.2	9.1	37.7	46.7	33.3	0.0	26.6	38.1	16.7	0.0
Sign	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Combinations	8.0	27.2	32.8	11.2	17.3	2.2	42.2	0.0	20.8	11.7	11.1	0.0	28.7	11.9	0.0	0.0
Combinations with Board[a]	4.8	8.9	21.2	1.1	3.8	0.0	27.7	0.0	3.9	0.0	0.0	0.0	1.1	7.1	0.0	0.0
Total Frequency Of Modes	125	158	189	89	133	45	83	11	77	66	9	2	94	42	6	0

[a]Percentage of combinations with board and one other mode calculated from the total number of modes.

Figure Caption

Figure 1. Percentage of board production for each subject across interactions.


PERCENTAGE OF BOARD PRODUCTION
100
90
80
70
60
50
40
30
20
10
(*) Total Frequency of Turns
1 Teacher Interaction
2 Speaking Peer Interaction
3 Nonspeaking Peer Interaction (Spontaneous)
4 Nonspeaking Peer Interaction (Elicited)
(125)
(133)
(77)
(94)
(158)
(45)
(66)
(42)
(189)
(83)
(9)(8)
(89)
(11)
(2)(0)
1 2 3 4
A
1 2 3 4
B
1 2 3 4
C
1 2 3 4
D
SUBJECT

frequently in one of the nonspeaking peer interactions than in the speaking peer interaction. In contrast, Subjects C and D only used their boards in the speaking peer interaction.

The primary communication modes exhibited by the majority of subjects across interactions involved verbal and gesture. Specifically, with regard to the verbal mode, all subjects, with the exception of Subject D, exhibited this mode more frequently in the teacher interaction than any other mode (see Figure 2). For Subject D, board (29.2%) and gesture (32.6%) modes were predominant in the teacher interaction. When comparing the percentage of verbal mode usage with teachers versus peers, Subjects A and B used this mode more frequently with the teacher than with the peers. In contrast, Subjects C and D were more verbal with the peers than with the teacher. Across subjects, no consistencies with respect to the use of the verbal mode were demonstrated in either the speaking versus nonspeaking peer interactions, or the spontaneous versus elicited nonspeaking peer interactions.

In terms of the gesture mode, all subjects, with the exception of Subject D, produced gestures more frequently in at least two of the peer interactions than in the teacher interaction (see Figure 3). Subject D produced gestures more frequently in the teacher interaction than in the other interactions. In terms of specific peer interactions,

Figure Caption

Figure 2. Percentage of verbal production for each subject across interactions.

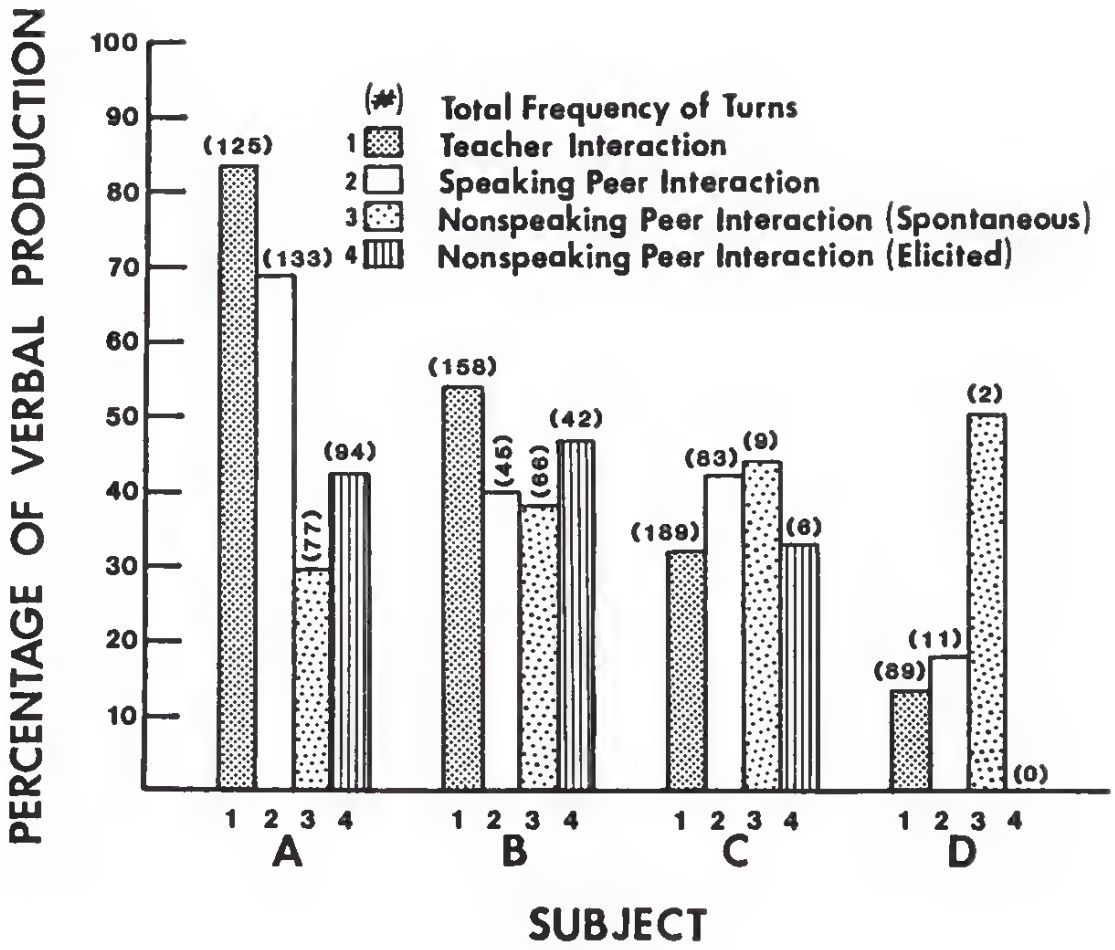
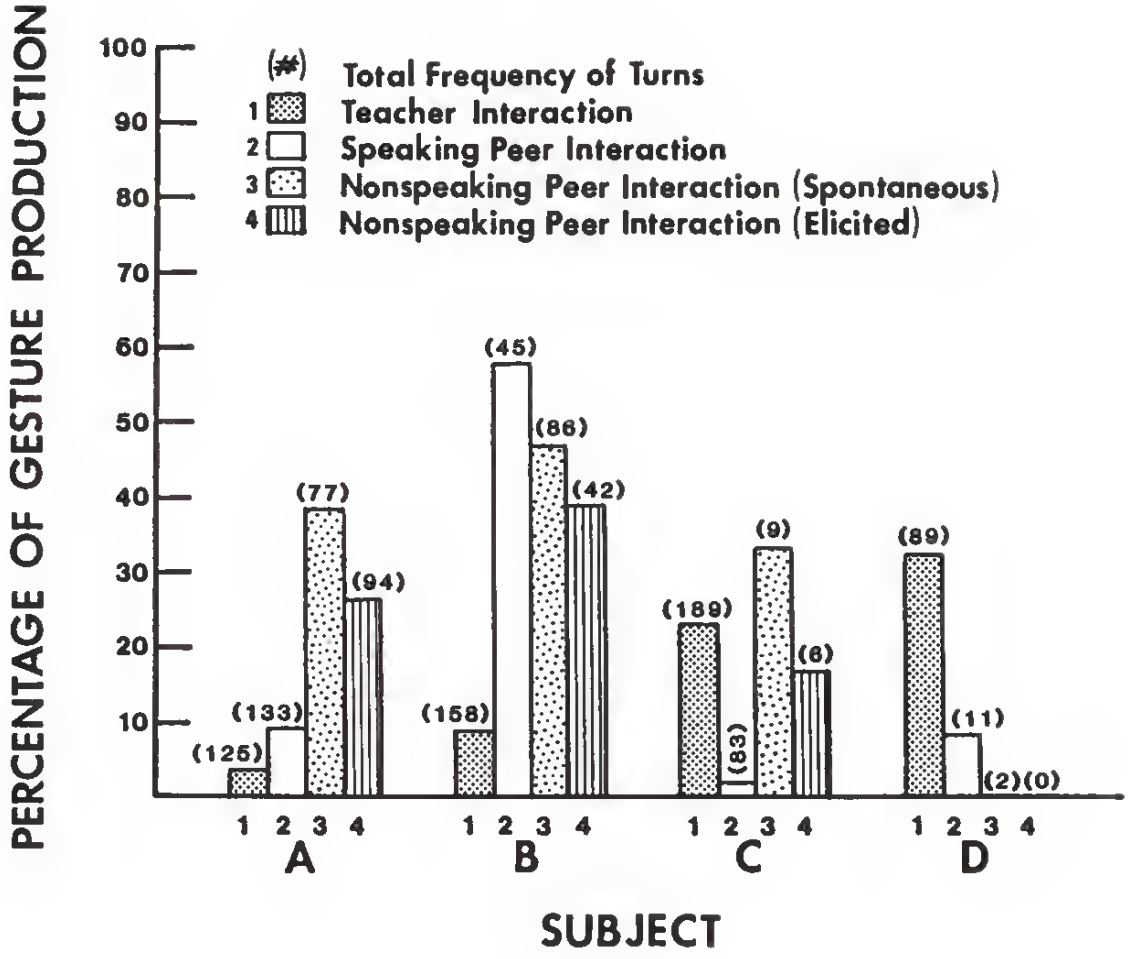

PERCENTAGE OF VERBAL PRODUCTION
100
90
80
70
60
50
40
30
20
10
(#) Total Frequency of Turns
1 Teacher Interaction
2 Speaking Peer Interaction
3 Nonspeaking Peer Interaction (Spontaneous)
4 Nonspeaking Peer Interaction (Elicited)
(125)
(133)
(77)
(94)
(158)
(45)
(66)
(42)
(189)
(83)
(9)
(6)
(89)
(11)
(2)
(0)
1 2 3 4
A
1 2 3 4
B
1 2 3 4
C
1 2 3 4
D
SUBJECT

Figure Caption

Figure 3. Percentage of Gesture Production for each subject across interactions.


PERCENTAGE OF GESTURE PRODUCTION
100
90
80
70
60
50
40
30
20
10
(#) Total Frequency of Turns
1 Teacher Interaction
2 Speaking Peer Interaction
3 Nonspeaking Peer Interaction (Spontaneous)
4 Nonspeaking Peer Interaction (Elicited)
(125)
(133)
(77)
(94)
(158)
(45)
(86)
(42)
(189)
(83)
(9)
(6)
(89)
(11)
(2)(0)
1 2 3 4
A
B
C
D
SUBJECT

Subjects A and C produced more gestures in both of the nonspeaking peer interactions than in the speaking peer interaction. In contrast, Subjects B and D produced gestures more frequently while interacting with the speaking peer than in both of the interactions with the nonspeaking peer.

The majority of subjects frequently combined two communication modes in their productions across the interactions. Subject C combined board usage with another mode more frequently than the other subjects in the teacher and speaking peer interactions.

In terms of the remaining communication modes, use of the other's board occurred infrequently by all subjects across the interactions examined. Vocal usage was exhibited primarily by Subjects D (50%; 1/2) and C (50%; 3/6) in a nonspeaking peer interaction. Sign (1.6%) was only produced by Subject C in the teacher interaction.

In summary, the primary communication modes exhibited by all subjects, with the exception of Subject D, across interactions involved verbal and gesture modes. For Subject D, board production was also prominent. Specifically, with regard to board production, each subject used his/her board more frequently in one of the peer interactions than in the teacher interaction. With the teachers, the majority of subjects exhibited verbal production more frequently than any other mode.

Communication Function

In terms of communication function (see Table 10), all subjects, with the exception of Subject D, exhibited requests more frequently in all of the peer interactions than in the teacher interaction (see Figure 4). In fact, less than ten percent of the message units of all the subjects in the teacher interaction consisted of requests. For Subject D, a greater percentage of requests was exhibited in the speaking peer interaction (9.1%) than in the teacher interaction (1.7%), and no requests were exhibited in either of the nonspeaking peer interactions. In terms of specific peer interactions, all subjects, again with the exception of Subject D, produced requests more frequently in the nonspeaking peer, spontaneous interaction than in either the speaking peer or nonspeaking peer, elicited interaction.

As expected, all subjects predominantly exhibited responses to requests in the teacher interactions (see Figure 5). In terms of specific peer interactions, all subjects produced responses to requests only in the speaking peer interaction.

All subjects, with the exception of Subject D, exhibited informatives more frequently in at least one of the peer interactions than in the teacher interaction. In fact, Subjects A and B produced a greater percentage of informatives in all of the peer interactions than in the teacher interaction. Subject D did not exhibit informatives

Table 10

Percentage of Communication Functions For Each Subject Across Interactions

Communication Function	Participant Interaction															
	Teacher Subject				Speaking Peer Subject				Nonspeaking Peer Spontaneous Subject				Nonspeaking Peer Elicited Subject			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
Requests	1.4	1.2	8.7	1.7	40.6	8.9	31.5	9.1	67.5	25.0	66.7	0.0	53.2	23.3	16.7	0.0
Response to Requests	66.2	74.6	60.2	56.0	11.3	4.4	25.8	27.3	0.0	3.3	0.0	0.0	0.0	16.3	0.0	0.0
Protest/ Disagreement	4.2	0.6	4.1	1.7	8.3	2.2	3.4	0.0	2.6	20.0	11.1	0.0	4.3	20.9	0.0	0.0
Repetition	0.7	0.0	1.0	0.8	0.0	0.0	0.0	0.0	6.7	3.3	0.0	0.0	1.1	4.7	0.0	0.0
Self-Repetition	0.0	0.6	1.0	1.7	10.5	2.2	3.4	0.0	1.3	1.7	11.1	0.0	5.3	4.7	0.0	0.0
Informative	2.1	4.1	12.2	0.8	11.3	8.9	16.9	0.0	5.2	15.0	0.0	0.0	7.5	16.3	0.0	0.0
Acknowledge-ment	4.9	6.0	4.1	0.0	3.0	2.2	6.7	0.0	1.3	6.7	0.0	0.0	1.1	2.3	0.0	0.0
Play	0.0	0.0	0.0	0.0	2.3	55.6	2.2	0.0	3.9	8.3	0.0	0.0	0.0	2.3	0.0	0.0
Affection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.4	10.0	0.0	0.0	4.3	4.7	0.0	0.0
No Response	12.0	6.5	3.6	24.6	0.0	0.0	6.7	50.0	0.0	0.0	0.0	0.0	0.0	2.3	0.0	0.0
Uncodable	7.0	6.5	3.6	7.2	16.5	11.1	4.5	13.7	3.9	6.7	11.1	100	11.7	4.7	66.7	0.0
Combinations	0.0	0.0	0.5	0.0	3.0	0.0	5.6	0.0	11.7	0.0	0.0	0.0	12.7	2.3	16.7	0.0
Total Frequency of Functions	142	169	196	118	133	45	89	22	77	60	9	2	94	43	6	0

Figure Caption

Figure 4. Percentage of requests for each subject across interactions.

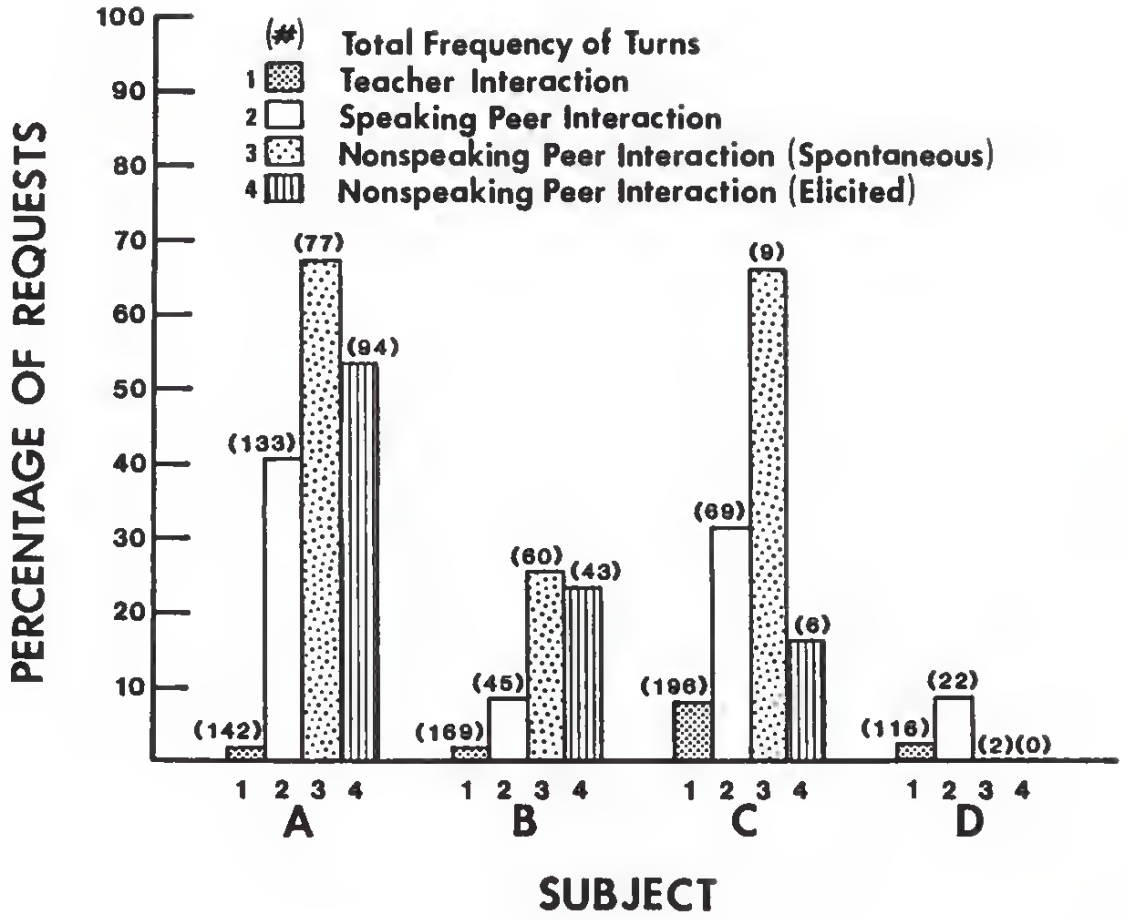
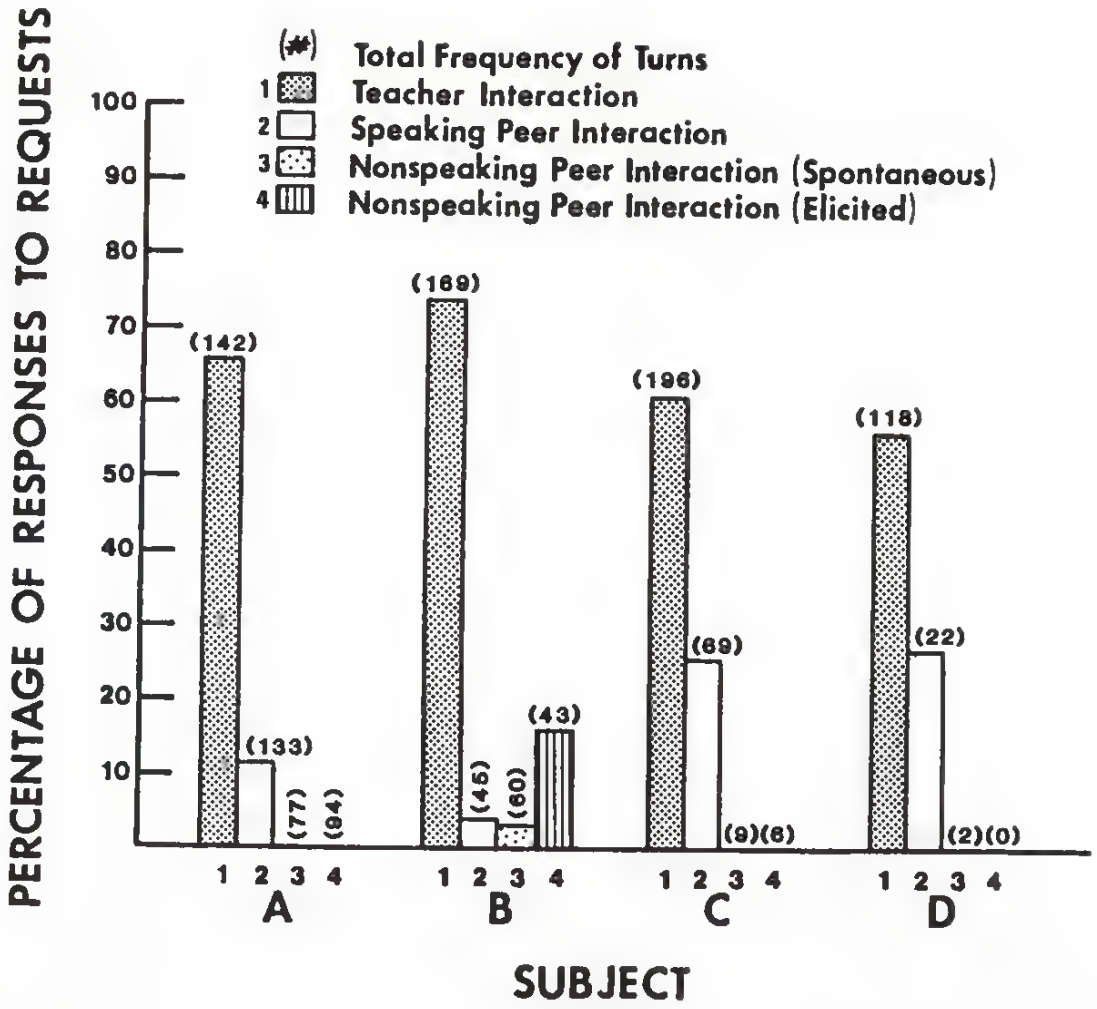

PERCENTAGE OF REQUESTS
100
90
80
70
60
50
40
30
20
10
(#) Total Frequency of Turns
1 Teacher Interaction
2 Speaking Peer Interaction
3 Nonspeaking Peer Interaction (Spontaneous)
4 Nonspeaking Peer Interaction (Elicited)
(142)
(133)
(77)
(94)
(169)
(45)
(60)
(43)
(196)
(69)
(9)
(6)
(116)
(22)
(2)(0)
1 2 3 4
A
1 2 3 4
B
1 2 3 4
C
1 2 3 4
D
SUBJECT

Figure Caption

Figure 5. Percentage of responses to requests for each subject across interactions.


PERCENTAGE OF RESPONSES TO REQUESTS
(*) Total Frequency of Turns
1 Teacher Interaction
2 Speaking Peer Interaction
3 Nonspeaking Peer Interaction (Spontaneous)
4 Nonspeaking Peer Interaction (Elicited)
100
90
80
70
60
50
40
30
20
10
(142)
(133)
(77)
(84)
(169)
(46)
(60)
(43)
(196)
(69)
(9)(6)
(118)
(22)
(2)(0)
1 2 3 4
A
1 2 3 4
B
1 2 3 4
C
1 2 3 4
D
SUBJECT

in any of the peer interactions. In terms of the specific peer interactions, Subjects A and C exhibited informatives more frequently in the speaking peer interaction than in both of the nonspeaking peer interactions. In contrast, Subject B produced a greater percentage of informatives in both of the nonspeaking peer interactions than in the speaking peer interaction.

For all subjects, play and affection were the only two communication functions that were not exhibited in the teacher interaction. In general, play occurred more frequently in the speaking peer than in the nonspeaking peer interactions. Affection was exhibited only by Subjects A and B in both of the nonspeaking peer interactions.

Across interactions, all subjects, excluding Subject B, infrequently exhibited protest/disagreement. For Subject B, protest/disagreement was one of the primary communication functions used in both of the nonspeaking peer interactions.

The communication function of no response was exhibited primarily in the teacher and speaking peer interactions. Each subject exhibited a fairly low percentage of uncodable functions, with the exceptions of Subject D in the nonspeaking peer, spontaneous interaction (100%; 2/2), and Subject C in the nonspeaking peer, elicited interaction (66.7%; 4/6). The remaining communication functions (i.e., repetition, self-repetition, acknowledgement, combinations) occurred infrequently across interactions.

In summary, as expected, the primary communication function exhibited by all subjects in the teacher interaction involved responses. In contrast, with peers, particularly nonspeaking peer in the spontaneous interaction, requests predominated. In terms of other communication functions, informatives were used more frequently with peers than with teachers. Play and affection occurred only in peer interactions. The remaining communication functions occurred infrequently across all subjects and interactions.

Communicator Role

Several levels of analyses were employed to describe the communicator role of the subjects across interactions. The data were first analyzed in terms of the specific type of communicator role exhibited, followed by analyses of the maintenance of topic over a number of turns, and the communication mode and function employed for topic initiations.

Specific Communicator Role. The subjects occupied the initiator role more frequently in at least one of the peer interactions than in the teacher interaction (see Table 11 and Figure 6). In fact, Subjects A and B exhibited the initiator role in each of the peer interactions. As expected, the subjects infrequently occupied the initiator role in the teacher interaction. In terms of the specific peer interactions, Subjects B and C exhibited the initiator role more frequently in the nonspeaking peer, spontaneous

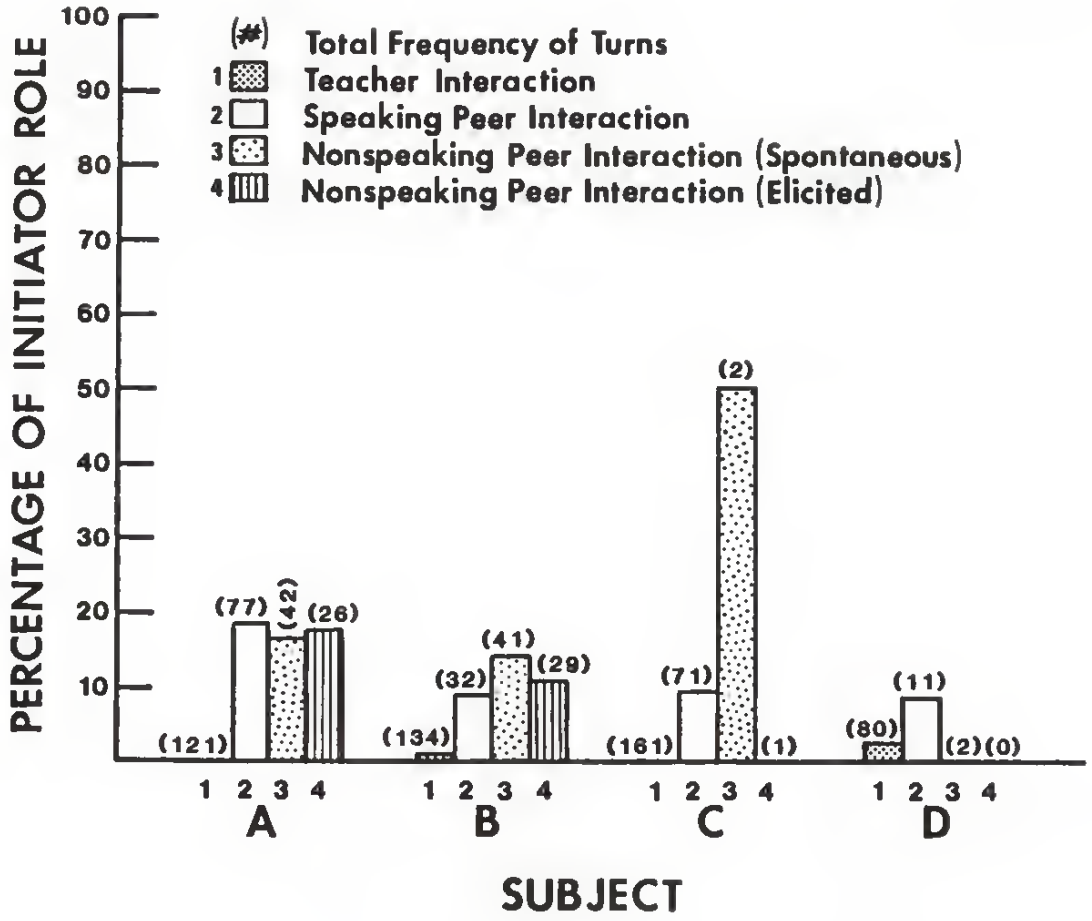
Table 11

Percentage of Communicator Roles Exhibited by Each Subject Across Interactions

Communicator Role	Participant Interaction															
	Teacher Subject				Speaking Peer Subject				Spontaneous Nonspeaking Peer Subject				Elicited Nonspeaking Peer Subject			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
Initiator	0.0	0.8	0.0	2.5	18.2	9.4	9.9	9.1	16.7	14.6	50.0	0.0	17.8	10.3	0.0	0.0
Maintainer	95.0	96.3	98.1	83.8	71.4	84.4	88.7	63.6	83.3	78.1	0.0	0.0	57.1	79.3	0.0	0.0
Maintainer/ Initiator	0.0	0.0	0.0	1.3	5.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.3	10.3	0.0	0.0
Consecutive Initiator	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	3.6	0.0	100	0.0
Uncodable	5.0	3.0	1.9	12.5	5.2	6.3	1.4	27.3	0.0	7.3	0.0	100	7.1	0.0	0.0	0.0
Total Frequency Of Turns	121	134	161	80	77	32	71	11	42	41	2	2	28	29	1	0

Figure Caption

Figure 6. Percentage of initiator roles for each subject across interactions.


PERCENTAGE OF INITIATOR ROLE
100
90
80
70
60
50
40
30
20
10
(#) Total Frequency of Turns
1 Teacher Interaction
2 Speaking Peer Interaction
3 Nonspeaking Peer Interaction (Spontaneous)
4 Nonspeaking Peer Interaction (Elicited)
(121)
(77)
(42)
(26)
(134)
(32)
(41)
(29)
(161)
(71)
(2)
(1)
(80)
(11)
(2)
(0)
1 2 3 4
A
B
C
D
SUBJECT

interaction than in the speaking peer interaction. However, while Subject C occupied this role 50% of the time, only two communicative turns were exhibited. Subject D occupied the initiator role only in the speaking peer interaction. The percentages of the initiator role occupied by Subject A were approximately equal across peer interactions.

Of course, the maintainer role was occupied more frequently than the initiator role across interactions, with the exception of Subject C in both of the nonspeaking peer interactions. The role of maintainer/initiator occurred infrequently across interactions, and the role of consecutive initiator was exhibited by only Subjects A and C in at least one of the nonspeaking peer interactions. However, while Subject C occupied this role 50% of the time in the nonspeaking peer, spontaneous interaction, and 100% of the time in the nonspeaking peer, elicited interaction, a low frequency of communicative turns was exhibited.

Topic Maintenance Over Turns. For each subject, with the exception of Subject B, a greater average number of maintained turns occurred per topic in the teacher interaction than in the peer interactions (see Table 12). For Subject B, topics were maintained for a greater average number of turns in the speaking peer interaction (19.0) than in the teacher interaction (15.9). In terms of the specific peer interactions, each subject, with the exception of Subject A, had a greater average number of maintained turns

Table 12

Average Number of Maintained Turns Per Topic Initiation Across Interactions for Each Subject

Subject	Participant Interactions			
	Teacher	Speaking Peer	Nonspeaking Peer Spontaneous	Nonspeaking Peer Elicited
A	16.3	3.6	5.2	3.1
B	15.9	19.0	5.2	3.1
C	25.7	7.1	0.0	0.0
D	20.9	2.3	0.0	0.0

per topic in the speaking peer interaction than in both of the nonspeaking peer interactions. For Subject A, topics were maintained over a greater average number of turns in the nonspeaking peer, spontaneous interaction than in the other two peer interactions. No topic maintenance occurred in the nonspeaking peer interactions involving Subjects C and D.

Communication Mode of Topic Initiations. The communication mode employed for topic initiations by each subject varied across the participant interactions (see Table 13). When Subjects B and D initiated topics with the teacher, only board production was exhibited. With the speaking peer, the subjects more frequently used a symbol mode (i.e., board, verbal, or a combination of symbol modes) to initiate a topic than other modes. In contrast, in both of the nonspeaking peer interactions, topics were predominantly initiated with the gesture mode or a combination of modes.

Communication Function of Topic Initiations. In general, the primary communication functions used for initiating topics across interactions involved requests followed by informatives (see Table 14). Play and a combination of modes were occasionally used for topic initiations in the peer interactions.

In summary, all subjects were initiators more frequently in interactions with peers than teachers, although topics were maintained over a greater average number of turns with

Table 13

Percentage of Communication Modes Employed for Topic Initiations For Each Subject Across Interactions

Communication Mode	Participant Interaction															
	Teacher Subject				Speaking Peer Subject				Nonspeaking Peer Spontaneous Subject				Nonspeaking Peer Elicited Subject			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
Board	0.0	100	0.0	100	0.0	0.0	28.6	100	14.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Others Board	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Verbal	0.0	0.0	0.0	0.0	66.7	66.7	0.0	0.0	14.3	33.3	33.3	0.0	45.5	16.8	50.0	0.0
Vocal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gesture	0.0	0.0	0.0	0.0	16.7	33.3	0.0	0.0	28.6	66.7	66.7	0.0	45.5	16.8	50.0	0.0
Sign	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Combinations	0.0	0.0	0.0	0.0	16.7	0.0	71.5	0.0	42.9	0.0	0.0	0.0	9.1	66.7	0.0	0.0
Combinations with Board[a]	0.0	0.0	0.0	0.0	0.0	0.0	28.6	0.0	0.0	0.0	0.0	0.0	0.0	33.3	0.0	0.0
Total Frequency Of Initiations	0	1	0	3	18	3	7	1	7	6	3	0	11	6	2	0

[a]Percentage of combinations with board and one other mode calculated from the total number of modes.

Table 14

Percentage of Communication Functions Employed for Topic Initiations For Each Subject Across Interactions

Communication Function	Participant Interaction															
	Teacher Subject				Speaking Peer Subject				Nonspeaking Peer Spontaneous Subject				Nonspeaking Peer Elicited Subject			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
Requests	0.0	0.0	0.0	66.7	61.2	66.6	57.1	100	71.5	33.3	100	0.0	81.9	66.6	50.0	0.0
Response to Requests	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Protest/ Disagreement	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Repetition	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Self-Repetition	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Informative	0.0	100	0.0	33.3	22.2	0.0	42.9	0.0	0.0	33.3	0.0	0.0	0.0	16.7	0.0	0.0
Acknowledge-ment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Play	0.0	0.0	0.0	0.0	0.0	33.3	0.0	0.0	0.0	33.3	0.0	0.0	0.0	16.7	0.0	0.0
Affection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
No Response	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Uncodable	0.0	0.0	0.0	0.0	0.0	16.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Combinations	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.6	0.0	0.0	0.0	18.2	0.0	50.0	0.0
Total Initiations	0	1	0	1	3	18	3	7	7	6	3	0	11	6	2	0

teachers than with peers. With speaking peers, topics were maintained over a greater average number of turns than with nonspeaking peers.

Further analyses of the subjects' topic initiations indicated that the communication mode for these initiations varied across participant interactions. Specifically, symbol modes (i.e., board or verbal) were used more frequently to initiate topics with teachers and speaking peers than with nonspeaking peers. Across interactions, the primary communication function used to initiate topics involved requests followed by informatives.

Chapter V

Discussion

The communicative performance (i.e., communication mode, function, role) of nonspeaking adolescents was examined across four different participant interactions: with a teacher, a speaking peer, and a nonspeaking peer in both a spontaneous and elicited situation. The results indicated that for each subject the communicative performance varied as a function of his/her communicative partner. The subjects' communication skills were different when interacting with peers than when interacting with teachers. Differences were also observed across the peer interactions.

Communication Mode

In terms of communication mode, the majority of subjects exhibited verbal production more frequently than any other mode in the teacher interaction. In fact, board production occurred infrequently in this interaction. These findings were similar to those reported by Harris (1982) and Calculator and Dollaghan (1982). With teachers, then, the subjects were using a mode which had been determined nonfunctional for the majority of their communication needs. An informal observation of the data revealed that the communication functions employed by the teachers may have influenced the subjects' primary use of the verbal mode. Specifically, the nature of the requests used by the teachers usually required a yes/no or one- to two-symbol response. It

may be that verbal production is a more expedient mode for responding to these types of requests. A more extensive investigation of the interrelationship between communication mode and function in nonspeaking persons and their teachers is warranted.

With respect to the peer interactions, the primary communication modes exhibited by the majority of subjects were verbal and gesture modes. Verbal and gesture productions may have been the most effective modes for attention-getting purposes. Board production, however, was more frequent in at least one peer interaction than in the teacher interaction. Of interest was the finding that Subjects C and D used their communication boards more frequently with a speaking peer who had received no formal training in communication board usage than with the teacher who had received formal training. The importance, then, of assessing a nonspeaking person's communication skills in more than just an interaction with a teacher is highlighted in this finding.

Communication Function

In terms of communication function, all subjects predominantly exhibited responses to requests in the teacher interaction. This type of communication pattern is characteristic of teacher-student discourse (Bloom & Knott, 1985). Similar findings were also reported by Light, Collier, and Parnes (1985) regarding the primary use of

yes/no responses by nonspeaking children while interacting with their teacher. In contrast, the majority of subjects exhibited requests more frequently in all of the peer interactions than in the teacher interaction. Normal-language learning children have also been reported to differ in their communication function usage according to the communicative partner (Martlew, et al., 1976; Sachs & Devins, 1976; Wilkinson, et al., 1981).

With respect to the specific peer interactions, the majority of subjects produced requests more frequently in the nonspeaking peer, spontaneous interaction than in either the speaking peer or nonspeaking peer, elicited interaction. Because the nonspeaking peer was a less effective communicator than the speaking peer, the subject may have been able to exhibit more control of the communication by requesting. In terms of the two nonspeaking peer interactions, more requests may have been exhibited in the spontaneous interaction than in the elicited interaction due to the novelty of the situation. The nonspeaking peer, spontaneous interaction was always videotaped prior to the nonspeaking peer, elicited interaction.

Play and affection were only exhibited in the peer interactions and not in the teacher interaction. These results indicated that the subjects adhered to pragmatic rules regarding the acceptability of language usage across various participant interactions (Chapman, 1982; Ervin-Tripp,

1976).

Communicator Role

In terms of communicator role, the initiator role was assumed infrequently across subjects when interacting with the teacher. This finding was similar to that reported by previous investigators regarding nonspeaking person-significant other adult interaction (Calculator & Dollaghan, 1982; Calculator & Luchko, 1983; Harris, 1982; Light, et al., 1985).

Each subject did, however, occupy the initiator role more frequently in interactions with peers than teachers. In fact, approximately 10% of the turns for all subjects in at least one of the peer interactions involved the initiator role. Harris (1982), in contrast, rarely observed students with communication boards interacting with peers. These differences may have been related to the settings employed for examining communicative performance. The children in Harris' study were observed in a classroom setting which may not have been conducive to peer interaction (Bloome & Knott, 1985). In the present study, the subjects were observed interacting with peers in a room outside of the classroom setting. More spontaneous communication between the subjects and peers may have occurred due to the fact that no adults were present during the videotaping and the setting was less structured than a classroom. An investigation of the communicative performance of nonspeaking persons while

interacting with peers in various natural settings (e.g., lunchroom, residential home, recreational room) is warranted.

With regard to initiations in the nonspeaking peer interactions, the participants themselves may have to be considered. Because there were no other nonspeaking persons at the school who shared the same type of communication board system, the subjects had to interact with each other during these situations (i.e., Subjects A and B interacted together, and Subjects C and D interacted together. Results regarding initiations in these situations must be interpreted carefully because of the dependence of Subjects A and B interacting together and Subjects C and D interacting together.

In terms of topic maintenance, a greater average number of maintained turns occurred per topic for the majority of subjects when interacting with a teacher than a peer. This finding was not surprising in that the teachers were able to structure the discourse primarily through the use of requests. With respect to specific peer interactions, topic maintenance for the majority of the subjects was greater with speaking peers than nonspeaking peers. The speaking peers were, perhaps, more competent communicators in maintaining topics than the nonspeaking peers.

The communication mode employed for topic initiations varied as a function of the communicative partner. For those subjects who initiated topics with teachers, the communication board was the only mode used. This finding was

interesting in light of the fact that the verbal mode was the primary mode exhibited in the teacher interaction. To initiate topics, however, the subjects selected the board mode instead of the verbal mode, perhaps as a means of increasing message intelligibility. With speaking peers, a variety of symbol modes was used to initiate topics. In contrast, with nonspeaking peers, gestures and combinations of modes predominated. At least with respect to the nonspeaking peers, the gesture mode may have been more effective than any other mode in attaining the listener's attention for purposes of initiating a topic.

The primary communication functions employed for topic initiations across interactions involved requests and informatives. Because the majority of the remaining communication functions cannot be used for initiations (e.g., acknowledgements), this communicative behavior did not appear to vary as a function of the participant interaction.

Interactions with Nonspeaking Peers

Because limited peer interaction with respect to nonspeaking persons has been reported in the literature (Calculator & Dollaghan, 1982; Calculator & Luchko, 1983; Harris, 1978), the subjects' communicative performance in this study was examined in both a spontaneous and an elicited situation. The latter situation was designed to elicit the communication function of request for objects specifically involving cookies and water. When examining the data,

however, the findings revealed that the majority of subjects either exhibited more requests for objects in the spontaneous situation than in the elicited situation, or exhibited no requests in either situation. Subject C did produce a request for object combined with another communication function on one occasion during the elicited situation. The cookies and water, therefore, may not have been effective tools in eliciting requests for objects. The exploration of other objects (e.g., money) is warranted. However, it may be that once these individuals are placed in a setting conducive to interaction, some of them might interact regardless of props.

Individual Differences

Although the subjects were closely matched by cognitive/language status and communication board system, individual differences were found. For example, in contrast to the other subjects, Subject D's frequent use of the board mode in the teacher interaction may have been related to her more limited speech motor abilities, affecting her intelligibility. Individual differences were also apparent across nonspeaking peer interactions. Subjects A and B interacted more frequently (i.e., more turns were exhibited) in these situations than Subjects C and D, who exhibited little or no interaction. These findings support the notion that heterogeneity is a primary characteristic of language-disordered populations (Chapman, 1982; Kirchner & Skarakis-

Doyle, 1983; Muma, 1978). Individual differences, therefore, must be recognized for purposes of language assessment and intervention.

Clinical Implications

From the results of this study, a few clinical implications are evident. In terms of the assessment of communication skills, the nonspeaking client could be observed communicating with at least two different communicative partners: a teacher/clinician and a speaking or nonspeaking peer. By assessing the nonspeaking client in at least these two different interactions, the clinician might be able to obtain a more complete picture of the client's communicative performance.

Traditionally, intervention for the nonspeaking person has focused primarily on the development of the communication board (e.g., symbol size and selection; vocabulary identification and use). Although the training of pragmatic skills of this population when interacting with 'significant other' adults has been recently addressed (Calculator & Luchko, 1983), little or no attention has been given to the involvement of peers in the intervention programs. As the results of this study have indicated, some nonspeaking persons cannot interact effectively with peers. For these individuals, then, direct group intervention may be necessary to facilitate peer interaction. Instruction can be given to the peers, specifically speaking peers, in how the

nonspeaking person uses his/her communication board. Also, both speaking and nonspeaking peers could be encouraged to use the client's board when communicating with him/her (Bottorf & DePape, 1982). Procedures for teaching topic initiations and maintenance between the nonspeaking person and his/her peer(s) could be an integral part of the intervention program.

Finally, training for teachers could focus on how to provide the nonspeaking student with the opportunity to initiate topics, request information, and exhibit informatives. Teachers could be instructed to encourage their nonspeaking students to use their communication board instead of primarily communicating verbally. For example, the use of open-ended questions is one means by which teachers could facilitate more board usage. It is important, however, to teach the nonspeaking person not only how to use his/her communication board for purposes of responding, but also for purposes of initiating and developing relationships with those persons in his/her environment.

References

ASHA. (1980). Non-speech communication: A position paper. American Speech and Hearing Association, 22, 267-272.

Bates, E. (1976). Pragmatics and sociolinguistics in child language. In D. Morehead & A. Morehead (Eds.), Normal and deficient child language. Baltimore: University Park Press.

Bedrosian, J. (1982). A sociolinguistic approach to communication skills: Assessment and treatment methodology for mentally retarded adults (Doctoral dissertation, University of Wisconsin, 1981). Dissertation Abstracts International, 42, 4338A.

Bloome, D., & Knott, G. (1985). Teacher-student discourse. In D. Ripich & F. Spinelli (Eds.), School discourse problems. San Diego, CA: College Hill Press.

Bottorf, L., & DePape, D. (1982). Initiating communication systems for severely speech-impaired persons. Topics in Language Disorders, 2, 55-72.

Calculator, S., & Dollaghan, C. (1982). The use of communication boards in a residential setting: An evaluation. Journal of Speech and Hearing Disorders, 47, 281-287.

Calculator, S., & Luchko, C. (1983). Evaluating the effectiveness of a communication board training program. Journal of Speech and Hearing Disorders, 48, 185-191.

Carlson, F. (1981). A format for selecting vocabulary for the nonspeaking child. Language, Speech, and Hearing Services in Schools, 12, 240-245.

Chapman, R. (1982). Issues in child language acquisition. In N. Lass, L. McReynolds, J. Northern, & D. Yoder (Eds.), Speech, language, hearing: Normal processes. Philadelphia, PA: W.B. Saunders Co.

Chapman, R., & Miller, J. (1980). Analyzing language and communication in the child. In R. L. Schiefelbusch (Ed.), Non-speech language and communication: Analysis and intervention. Baltimore, MD: University Park Press.

Coggins, T., Carpenter, R., & Owings, N. (1983). Examining early intentional communication in down's syndrome and nonretarded children. British Journal of Disorders of Communication, 18, 99-107.

Corsaro, W. (1974). Sociolinguistic patterns in adult-child interaction. Unpublished paper, Indiana University.

Dihoff, R. (1976). Standard and nonstandard applications of Piagetian assessment procedures. In J. Miller (Ed.), A manual of procedures for assessing children's language behavior: A developmental process approach. Unpublished manuscript, University of Wisconsin-Madison.

Dunn, L., & Dunn, L. (1981). The Revised Peabody Picture Vocabulary Test: Form L. Circle Pines, MN: American Guidance Service.

Ervin-Tripp, S. (1976). Language acquisition and communicative choice. Stanford, CA: Standford University Press.

Fey, M., & Leonard, L. (1984). Partner age as a variable in the conversational performance of specifically language-impaired and normal-language children. Journal of Speech and Hearing Research, 27, 413-423.

Fey , M., Leonard, L., & Wilcox, K. (1984). Speech style modifications of language-impaired children. Journal of Speech and Hearing Disorders, 46, 91-96.

French, J. (1964). The Pictorial Test of Intelligence. Boston: Houghton Mifflin Co.

Gallagher, T. (1983). Pre-assessment: A procedure for accommodating language use variability. In T. Gallagher & C. Prutting (Eds.), Pragmatic assessment and intervention issues in language. San Diego, CA: College-Hill Press, Inc.

Gill, G. (1979). Piagetian cognitive assessment: Procedures from a variety of sources arranged for convenient clinical use. Unpublished paper, University of Wisconsin-Madison.

Harris, D. (1978). Descriptive analysis of communicative interaction processed involving nonvocal severely handicapped children. Unpublished doctoral dissertation, University of Wisconsin-Madison.

Harris, D. (1982). Communicative interaction processes involving nonvocal physically handicapped children. Topics in Language Disorders, 2, 21-37.

Harris, D., & Vanderheiden, G. (1980). Augmentative communication techniques. In R. L. Schiefelbusch (Ed.), Non-speech language and communication: Analysis and intervention. Baltimore, MD: University Park Press.

Kirchner, D., & Skarakis-Doyle, E. (1983). Developmental language disorders: A theoretical perspective. In T. Gallagher & C. Prutting (Eds.), Pragmatic assessment and intervention issues in language. San Diego, CA: College-Hill Press, Inc.

Light, J., Collier, B., & Parnes, P. (1985). Communicative interaction between young nonspeaking physically disabled children and their primary caregivers: Part 1--Discourse patterns, Augmentative and Alternative Communication, 1, 74-83.

Light, J., Collier, B., & Parnes, P. (1985). Communicative interaction between young nonspeaking physically disabled children and their primary caregivers: Part 11--Communicative function. Augmentative and Alternative Communication, 1, 98-107.

Martlew, M., Connolly, K., & McCleod, C. (1978). Language use, role and context in a five year old. Journal of Child Language, 5, 81-99.

Meyers, L., Andersen, C., & Liddicoat, C. (1984). Perceived communication needs of developmentally delayed nonspeaking children. The Psychological Record, 34, 55-68.

Miller, J. (1981). Assessing language production in children: Experimental procedures. Baltimore, MD: University Park Press.

Miller, J., & Yoder, D. (1984). The Miller-Yoder Test of Language Comprehension. Baltimore, MD: University Park Press.

Muma, J. (1978). Language handbook: Concepts, assessment and intervention. Englewood Cliffs, NJ: Prentice-Hall, Inc.

Nisbet, J., Zanella, K., & Miller, J. (1984). An analysis of conversations among handicapped students and a nonhandicapped peer. Exceptional Children, 51, 156-162.

Owens, R., & House, L. (1984). Decision-making processes in augmentative communication. Journal of Speech and Hearing Disorders, 49, 18-25.

Piaget, J., & Inhelder, B. (1964). The early growth of logic in the child: Classification and seriation. London: Routledge and K. Paul.

Sachs, J., & Devin, J. (1976). Young children's use of age-appropriate speech styles in social interaction and role-playing. Journal of Child Language, 3, 81-98.

Shane, H., & Bashir, A. (1980). Election criteria for the adoption of an augmentative communication system: Preliminary considerations. Journal of Speech and Hearing Disorders, 45, 408-414.

Shatz, M., & Gelman, R. (1973). The development of communication skills: Modification in the speech of young children as a function of the listener. Monographs of the Society of Research in Child Development, 38, 1-37.

Silverman, F. (1980). Communication for the speechless. Englewood Cliffs, NJ: Prentice-Hall, Inc.

Van Kleeck, A., & Frankel, T. (1981). Discourse devices used by language disordered children: A preliminary investigation. Journal of Speech and Hearing Disorders, , 250-257.

Wanska, S., & Bedrosian, J. (in press). Topic and communicative intent in mother-child discourse. Journal of Child Language.

Wechsler, D. (1955). Manual for the Wechsler Adult Intelligence Scale. New York: Psychological Corporation.

Wellman, H., & Lempers, J. (1977). The naturalistic communicative abilities of two year olds. Child Development, 48, 1052-1057.

Wilkinson, L., Heibert, E., & Rembold, K. (1981). Parents' and peers' communication to toddlers. Journal of Speech and Hearing Research, 24, 383-388.

Appendix A

An Overview of Nonspeech Communication, Selection of Candidates for Augmentative Communication Systems, and the Development of Communication Boards

The purpose of this appendix is to first outline the American Speech-Language-Hearing Association's (ASHA) position with regard to nonspeech communication. Next, the criteria used in recommending individuals for augmentative communication systems will be reviewed. A discussion of the development of communication boards will follow.

ASHA Position on Nonspeech Communication

The American Speech-Language-Hearing Association (ASHA, 1980) developed a position statement concerning nonspeech communication. The committee members operationally defined nonspeaking as "a group of individuals for whom speech is temporarily or permanently inadequate to meet all of his or her communication needs, and whose inability to speak is not due primarily to a hearing impairment" (p. 268). ASHA also defined the term augmentative communication system as "the total functional communication system of an individual which includes a communicative technique, a symbol set or system, and communication/interaction behaviors" (p. 268).

Historically, nonspeaking persons were either inappropriately placed in speech treatment programs or were not provided with a means to communicate. Recent advances in augmentative communication have given these individuals the

opportunity to communicate. In their position statement, ASHA suggested that all nonspeaking persons should be able to use some augmentative communication regardless of the severity of the physical handicap of the person. Although several professionals are involved in providing appropriate services to the nonspeaking individual, ASHA contended that the speech-language pathologist should be primarily responsible for the implementation of the program.

Selection of Candidates for Augmentative Communication Systems

Several factors are considered before an individual is provided with an augmentative communication system. Three somewhat similar criteria are available to aid clinicians in determining who is a candidate for an augmentative communication system.

Shane and Bashir (1980) developed a matrix consisting of ten factors to be considered prior to the recommendation of an augmentative communication system. According to these investigators, a cognitive level of Sensorimotor Stage V and persistent oral reflexes (i.e., rooting, gagging, biting, sucking, swallowing, and/or jaw extension) were necessary criteria before implementing this type of system. A discrepancy between receptive and expressive skills, poor oral-motor skills, unintelligible speech except to family and familiar friends, pointing and gesturing as the primary mode of communication, and an observable frustration due to an

inability to speak were other factors that a clinician must consider. Emotional factors such as refusing to speak or speaking only to selected persons may also play a role in this decision. Shane and Bashir recommended that the child have a chronological age of at least three years and that previous speech therapy has been attempted. Finally, but most importantly, the family must be willing to implement an augmentative communication system.

Chapman and Miller (1980) also outlined some guidelines to aid in deciding whether to elect or reject an augmentative communication system. In contrast to Shane and Bashir's matrix, they stressed that the possession of communicative intent was a necessary prerequisite for the election of an augmentative communication system in addition to Sensorimotor Stage VI level of functioning.

Finally, in the matrix developed by Owens and House (1984), the client must first demonstrate a cognitive level of at least Sensorimotor Stage V, the cognitive correlates necessary for expressive symbol use, before considering any other factors. If the client does demonstrate the minimum cognitive level, he/she must then display early social/communicative behaviors such as auditory notice, eye contact, attending, turn taking, and gesturing. Receptive language skills and poor motor speech skills were other considerations, although Owens and House recommended that speech therapy should continue for at least one year before

determining that this therapy has been unsuccessful. Finally, the willingness of 'significant others' in the client's environment to implement an augmentative communication system was another important consideration in the selection process.

Development of the Communication Board

Once an individual has been selected as a candidate for an augmentative communication system, the system needs to be developed. One type of augmentative communication system is the communication board. The development of a communication board involves three steps: development of an appropriate selection system, provision of a symbol system, and selection of appropriate vocabulary.

Selection Systems. The first step in the development of a communication board involves the selection of the most appropriate augmentative communication technique. Harris and Vanderheiden (1980) discussed three basic approaches to communication systems for nonspeaking persons: direct selection, scanning, and encoding. The most straightforward, natural, and efficient approach involves direct selection. When using this technique, the user points directly to the elements of a message. Scanning requires less physical control by the user than direct selection in that the nonspeaking person signals when the desired element of a message has been scanned. This latter approach is more appropriate for severely physically handicapped individuals.

Encoding is a technique for an individual with some physical control but poor range of motion. This approach involves a pattern or a code of signals to indicate the message elements. The code is memorized or displayed on a chart for both the message sender and message receiver to use as a reference during conversation. By using the encoding technique, the nonspeaking person could, for example, point to two numbers on a number line to indicate the code for each message element.

Symbol Systems. The nonspeaking person must be provided with a means of indicating and transmitting his/her message to another person. The second step in developing a communication board involves the selection of an appropriate symbol system. According to Silverman (1980), when selecting a symbol system, the following variables should be considered: the symbol system's intelligibility to untrained observers, its ability to convey messages concerning and removed from the here and now, its ability to convey abstract concepts, its syntactic and semantic structure, the similarity of its linguistic structure to English, the time and energy investment required to learn to use and interpret the symbol system, and populations with which it has been used. The cognitive requirements of each symbol system should also be considered (Chapman & Miller, 1980).

The following symbol systems could be used in conjunction with a communication board: photographs, pictures, drawings,

English or an orthographic system, Blissymbols (ideographic symbols used to represent concepts), Rebuses (ideographic symbols used to initiate reading instruction), or the Yerkish lexigran language. In general, the clinician's task should involve introducing a symbol system which provides for the expression of an unrestricted set of meanings in order to allow the nonspeaking person to communicate as effectively and independently as possible (Calculator & Dollaghan, 1982).

Vocabulary. The third step in the development of a communication board involves the selection of appropriate vocabulary. Meyers, Andersen, and Liddicoat (1984) studied the perceived communication needs of developmentally-delayed, nonspeaking children in order to develop a vocabulary for their communication boards. The authors contended that because the vocabulary chosen for a communication board could strongly affect the type and quality of the communication, it must be representative of the nonspeaking person's communication needs. The results indicated that vocabulary should be divided into four areas: interpersonal and academic communication needs; home/living facility and family/caretaker needs; basic needs of the students; and miscellaneous internal states involving more cognitively based and less biological items.

Carlson (1981) stated that while attempting to supply the communication board user with a functional vocabulary, speech-language pathologists usually provide the nonspeaking

person with the view that communication only consists of requesting basic wants and needs. She contended that we need to look at the activities and interests of the nonspeaking person rather than only supplying the individual with words that the adult thinks he/she needs to communicate.

Bottorf and DePape (1982) outlined five steps to be followed in the development of vocabulary for a communication board: requesting lists from persons in the individual's environment and discussing these lists with the future system user; observing the ongoing daily activities of the individual; including items on a trial basis and monitoring their usefulness and applicability to situations; drawing from clinical experience; and discovering possible interests of the individual by interviewing, observing peers, etc. The investigators further stated that the vocabulary selected should allow for expression of more than just concrete messages. Finally, Bottorf and DePape suggested that the nonspeaking person's environment should be labelled with the symbols that were being used in order to encourage others to incorporate the symbols into their ongoing interaction with the nonspeaking person.

Appendix B

Individual Subject Description

Subject A

Subject A was a 14.9-year-old ambulatory male who had suffered a cerebrovascular accident before the age of eighteen months. He had attended the residential school for approximately thirteen years.

Subject A's full scale IQ was 46 as measured with the French-Pictorial Test Of Intelligence administered four months prior to this study. The results of the informal cognitive assessment indicated that subject A was functioning in: early to middle preoperations (2.1 to 5.6 years) for seriation and classification tasks; middle preoperations (4.1 to 5.6 years) for drawing and one-to-one correspondence of non-complimentary sets; and concrete operations (7 to 12 years) for one-to-one correspondence of complimentary sets. Conservation and transitivity tasks were not mastered indicating that the subject was functioning within the preoperational period of cognitive development (2 to 7 years) for these tasks.

In terms of his level of language comprehension, Subject A exhibited a total age level score between 4 and 5 years on the Miller-Yoder Test of Comprehension, and an age equivalent score of 9 years, 7 months on Form L of the Revised-Peabody Picture Vocabulary Test. Informal comprehension assessment

results indicated that the subject comprehended all of the symbols on his communication board and in his communication notebook.

Subject A communicated with a communication board and notebook using direct selection with his finger. His communication board consisted of approximately 185 symbols in addition to the English alphabet and the numbers 0 to 9; and his notebook consisted of 31 pages with a range of 1 to 35 symbols per page. His board symbol production ranged from 1 to 4 symbols per message unit across the four interactions.

Visual and auditory abilities were reported to be within normal limits.

Subject B

Subject B was a 18.6-year-old nonambulatory female with spastic paraplegic cerebral palsy, moderate retardation, and partial left facial paralysis. She had attended the residential school for approximately fourteen years.

Subject B had a verbal IQ of 54, a performance IQ of 59, and a full scale IQ of 53 as measured with the Weschler Adult Intelligence Scale. The results of the informal cognitive assessment indicated that she was functioning in: early to middle preoperations (2.1 to 5.6 years) for dichotomies; middle preoperations (4.1 to 5.6 years) for drawing; middle to late preoperations for free sorting; late preoperations (5.7 to 7 years) for seriation; and concrete operations (7 to 12 years) for one-to-one correspondence tasks. Conservation

and transitivity tasks were not mastered indicating that the subject was functioning within the preoperational period of cognitive development (2 to 7 years) for these tasks.

In terms of her level of language comprehension, Subject B exhibited a total age level score between 4 and 5 years on The Miller-Yoder Test of Comprehension, and an age equivalent score of 5 years, 7 months on Form L of the Revised-Peabody Picture Vocabulary Test. Informal comprehension assessment results indicated that the subject comprehended all of the symbols on her communication board.

Subject B communicated with a communication board using direct selection with her finger. Her communication board consisted of 242 English orthographic symbols in addition to the English alphabet and the numbers 0 to 9. Her board symbol production ranged from 1 to 5 symbols per message unit across the four interactions.

The subject's auditory abilities were reported to be within normal limits, and her visual abilities were within normal limits with the aid of glasses.

Subject C

Subject C was a 15.7-year-old nonambulatory male who possessed spastic diplegic cerebral palsy in conjunction with a severe seizure disorder. He had attended the school for approximately seven years.

Subject C's IQ was 31 as measured with the French-Pictorial Test of Intelligence. The results of the informal

cognitve assessment indicated that he was functioning in: early to middle preoperations (2.1 to 5.6 years) for seriation and dichotomies; middle preoperations (4.1 to 5.6 years) for drawing and one-to-one correspondence of non-complimentary sets; middle to late preoperations (4.1 to 7 years) for free-sorting; and concrete operations (7 to 12 years) for one-to-one correspondence tasks of complimentary sets. Conservation tasks were not mastered. Subject C did, however, master the transitivity tasks indicative of the concrete operational period of development (7 to 12 years).

In terms of his language comprehension, Subject C exhibited a total age level score between 3 an 4 years on The Miller-Yoder Test of Comprehension, and an age equivalent score of 6 years, 1 month on Form L of the Revised-Peabody Picture Vocabulary Test. Informal comprehension assessment results indicated that the subject comprehended all symbols on his communication board and in his communication notebook.

Subject C predominantly communicated with a communication board and notebook using direct selection with his finger. His communication board consisted of 165 symbols in addition to the English alphabet and the numbers 0 to 9, and his notebook consisted of 18 pages with a range of 4 to 35 symbols per page. His board symbol production ranged from 1 to 4 symbols per message unit across the four interactions. Subject C also occasionally communicated with a signed symbol system.

The subject's visual and auditory abilities were reported to be within normal limits.

Subject D

Subject D was a 17.4-year-old nonambulatory female with severe athetoid quadriplegic cerebral palsy and swallowing and respiratory difficulties. She had attended the school for approximately eleven years.

No standardized IQ score was available for Subject D at the time of this study. The results of the informal cognitive assessment indicated that she was functioning in: early to middle preoperations (2.1 to 5.6 years) for seriation and dichotomies; middle preoperations (4.1 to 5.6 years) for one-to-one correspondence of non-complimentary sets; middle to late preoperations (4.1 to 7 years) for free-sorting; and concrete operations (7 to 12 years) for one-to-one correspondence of complimentary sets. Conservation and transitivity tasks were not mastered indicating that she was functioning within the preoperational period of development for these tasks. Drawing tasks were not attempted due to Subject D's physical limitations.

In terms of her language comprehension, Subject D exhibited a total age level score between 4 and 5 years on The Miller-Yoder Test of Comprehension, and an age equivalent score of 8 years, 4 months on Form L of the Revised-Peabody Picture Vocabulary Test. Informal comprehension assessment results indicated that the subject comprehended all symbols

on her communication board and in her communication notebook.

Subject D communicated with a communication board and notebook using direct selection with her fist. Her communication board consisted of 152 symbols, and her communication notebook consisted of 35 pages with a range of 3 to 26 symbols per page. Her board symbol production ranged from 1 to 5 symbols per message unit across the four interactions.

The subject's visual and auditory abilities were reported to be within normal limits.

Appendix C

Individual Subject Results

For each subject as well as for his/her respective communication partners across the interactions examined, results for communication mode, function, and role are as follows:

Subject A

Communication Mode. Subject A primarily communicated verbally across all interactions, with the exception of the nonspeaking peer, spontaneous interaction (see Table 15). In this interaction, gestures (37.7%) also predominated. With respect to board production, Subject A used his board more frequently in the nonspeaking peer, spontaneous interaction (9.1%) than in any of the other interactions. However, board usage, in general, occurred infrequently across all interactions. Use of the other's board, vocalizations, and combinations with board production also occurred infrequently across all interactions.

In terms of the communication partners, both the teacher (84.0%) and the speaking peer (68.4%) used the verbal mode more frequently than any other mode. For the nonspeaking peer, both the verbal and gesture mode predominated.

Communication Function. Subject A exhibited requests more frequently in all of the peer interactions than in the teacher interaction (see Table 16). The most predominant types of requests exhibited by Subject A in the peer

Table 15

Percentage of Communication Modes For Subject A and His Respective Communication Partners Across Interactions

Communication Mode	Participant Interaction							
	A---T[a]		A---SP[b]		A---NSP(S)[c]		A---NSP(E)[d]	
Board	1.6	0.0	0.8	0.0	9.1	1.7	0.0	7.1
Other's Board	0.0	0.0	0.0	0.0	2.6	1.7	1.1	0.0
Verbal	84.0	97.8	68.4	73.7	29.9	38.3	42.6	45.2
Vocal	2.4	0.8	4.5	11.2	0.0	0.0	1.1	0.0
Gesture	4.0	0.0	9.8	9.9	37.7	46.7	26.6	38.1
Sign	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Combinations	8.0	1.5	17.3	4.6	20.8	11.7	28.7	11.9
Combinations with Board[e]	4.8	1.5	3.8	1.3	3.9	0.0	1.1	7.1
Total Number of Modes	125	275	133	152	77	60	94	42

[a] A---T=Subject A and Teacher; [b] A---SP=Subject A and Speaking Peer; [c] A---NSP(S)=Subject A and Nonspeaking Peer (Spontaneous); [d] A---NSP(E)=Subject A and Nonspeaking Peer (Elicited); [e] Percentage of combinations with board and one other mode calculated from the total number of modes.

Table 16

Percentage of Communication Functions For Subject A and His Respective Communication Partners Across Interactions

Communication Function	Participant Interaction							
	A---T[a]		A---SP[b]		A---NSP(S)[c]		A---NSP(E)[d]	
Request for Object	0.0	0.0	0.0	0.0	15.6	3.3	1.1	0.0
Request for Action	0.0	0.4	10.5	7.8	20.8	15.0	16.0	14.0
Request for Information	0.0	51.3	3.8	7.2	1.3	0.0	9.6	0.0
Request for Permission	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Request for Attention	1.4	1.5	17.3	3.9	27.3	5.0	19.2	4.7
Request for Repair	0.0	6.9	8.3	8.5	1.3	1.7	2.1	2.3
Indirect Request	0.0	1.8	0.8	0.0	1.3	0.0	5.3	2.3
Response to Requests	66.2	0.4	11.3	5.2	0.0	3.3	0.0	16.3

[a]A---T=Subject A and Teacher; [b]A---SP=Subject A and Speaking Peer; [c]A---NSP(S)=Subject A and Nonspeaking Peer (Spontaneous); [d]A---NSP(E)=Subject A and Nonspeaking Peer (Elicited).

(table continues)

Communication Function	Participant Interaction							
	a		b		c		d	
	A---T		A---SP		A---NSP(S)		A---NSP(E)	
Protest/ Disagreement	4.2	2.9	8.3	2.0	2.6	20.0	4.3	20.9
Repetition	0.7	4.4	0.0	0.7	6.7	3.3	1.1	4.7
Self-repetition	0.0	0.4	10.5	11.8	1.3	1.7	5.3	4.7
Informative	2.1	22.9	11.3	17.6	5.2	15.0	7.5	16.3
Acknowledge-ment	4.9	5.5	3.0	5.2	1.3	6.7	1.1	2.3
Play	0.0	0.0	2.3	21.6	3.9	8.3	0.0	2.3
Affection	0.0	0.0	0.0	0.0	10.4	10.0	4.3	4.7
No Response	12.0	0.0	0.0	0.7	0.0	0.0	0.0	2.3
Uncodable	7.0	4.4	16.5	1.3	3.9	6.7	11.7	4.7
Combinations	0.0	0.0	3.0	0.0	11.7	0.0	12.8	2.3
Total Frequency of Functions	142	275	133	153	77	60	94	43

interactions were requests for attention and action. In contrast, the most frequently occurring communication functions exhibited by Subject A in the teacher interaction were responses to requests (66.2%) and no responses (12.0%). Informatives were used more frequently with peers than with the teacher. Play and affection occurred only in the peer interactions. Protests/disagreements, repetitions, self-repetitions, acknowledgements, and combinations of two or more communication functions were exhibited infrequently.

With respect to Subject A's communication partners, the teacher primarily produced requests, specifically involving requests for information (51.3%), followed by informatives (22.9%). The speaking peer primarily exhibited play (21.6%), informatives (17.6%), and self-repetitions (11.8%). With respect to the nonspeaking peer, protest/disagreement was the primary function exhibited in both the spontaneous (20.0%) and elicited (20.9%) interactions, followed by informatives and requests for action.

Communicator Role. Subject A did not exhibit any type of initiator role (i.e., initiator, maintainer/initiator, or consecutive initiator) in the teacher interaction (see Table 17). In contrast, he did exhibit some type of initiation in each of the peer interactions. The communication function most frequently employed for his topic initiations with peers was request for attention (see Table 18). Other frequently occurring communication functions used for topic initiations

Table 17

Percentage of Communicator Roles For Subject A and His Respective Communication Partners Across Interactions

Communicator Role	Participant Interaction							
	A---T[a]		A---SP[b]		A---NSP(S)[c]		A---NSP(E)[d]	
Initiator	0.0	6.5	18.2	18.0	16.7	14.6	17.9	10.3
Maintainer	95.0	88.6	71.4	78.2	83.3	78.1	57.1	79.3
Maintainer/ Initiator	0.0	3.3	5.2	1.3	0.0	0.0	14.3	10.3
Consecutive Initiator	0.0	1.6	0.0	2.6	0.0	0.0	3.6	0.0
Uncodable	5.0	0.0	5.2	0.0	0.0	7.3	7.1	0.0
Total Number of Turns	121	123	77	78	42	41	28	29

[a]A---T=Subject A and Teacher; [b]A---SP=Subject A and Speaking Peer; [c]A---NSP(S)=Subject A and Nonspeaking Peer (Spontaneous); [d]A---NSP(E)=Subject A and Nonspeaking Peer (Elicited).

Table 18

Percentage of Communication Functions Employed for Topic Initiations for Subject A and His Respective Communication Partners Across Interactions

Communication Function	Participant Interaction							
	A---T[a]		A---SP[b]		A---NSP(S)[c]		A---NSP(E)[d]	
Request for Object	0.0	0.0	0.0	0.0	0.0	0.0	9.1	0.0
Request for Action	0.0	0.0	5.6	0.0	28.6	0.0	0.0	33.3
Request for Information	0.0	56.3	0.0	21.1	0.0	0.0	9.1	0.0
Request for Permission	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Request for Attention	0.0	0.0	55.6	10.5	42.9	33.3	45.5	33.3
Request for Repair	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Indirect Request	0.0	6.3	0.0	0.0	0.0	0.0	18.2	0.0
Response to Requests	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Protest/ Disagreement	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Repetition	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

[a] A---T=Subject A and Teacher; [b] A---SP=Subject A and Speaking Peer; [c] A---NSP(S)=Subject A and Nonspeaking Peer (Spontaneous); [d] A---NSP(E)=Subject A and Nonspeaking Peer (Elicited).

(table continues)

Communication Function	Participant Interaction							
	A---T[a]		A---SP[b]		A---NSP(S)[c]		A---NSP(E)[d]	
Self-Repetition	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Informative	0.0	37.5	22.2	15.8	0.0	33.3	0.0	16.7
Acknowledge-ment	0.0	0.0	0.0	5.3	0.0	0.0	0.0	0.0
Play	0.0	0.0	0.0	47.4	0.0	33.3	0.0	16.7
Affection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
No Response	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Uncodable	0.0	0.0	16.7	0.0	0.0	0.0	0.0	0.0
Combinations	0.0	0.0	0.0	0.0	28.6	0.0	18.2	0.0
Total Initiations	0	16	18	19	7	6	11	6

involved informatives (22.2%) in the speaking peer interaction and requests for action (28.6%) in the nonspeaking peer, spontaneous interaction. Combinations of functions were frequently employed for topic initiations in both of the nonspeaking peer interactions.

Initiations were exhibited by each of Subject A's communication partners. The teacher primarily employed the communication functions of request for information (56.3%) and informatives (37.5%) for topic initiations. Play (47.4%) was primarily employed by the speaking peer for topic initiations followed by requests for information (21.1%), informatives (15.8%), and requests for attention (10.5%). The nonspeaking peer primarily employed requests for attention, informatives, and play for topic initiations in the two interactions.

Subject B

Communication Mode. Subject B primarily communicated verbally and gesturally across all interactions (see Table 19). With respect to board production, Subject B used her board more frequently in the nonspeaking peer, elicited interaction (7.1%) than in any of the other interactions. Board production was not exhibited by Subject B in the speaking peer interaction. Combinations of two or more modes, particularly involving board production, occurred frequently in the teacher interaction. Use of the other's board and vocalizations occurred infrequently across all

Table 19

Percentage of Communication Modes For Subject B and Her Respective Communication Partners Across Interactions

Communication Mode	Participant Interaction							
	B---T[a]		B---SP[b]		B---NSP(S)[c]		B---NSP(E)[d]	
Board	5.1	0.0	0.0	0.0	1.7	9.1	7.1	0.0
Other's Board	0.0	0.0	0.0	0.0	1.7	2.6	0.0	1.1
Verbal	54.4	99.2	40.0	100	38.3	29.9	45.2	42.6
Vocal	3.8	0.0	0.0	0.0	0.0	0.0	0.0	1.1
Gesture	9.5	0.0	57.8	0.0	46.7	37.7	38.1	26.6
Sign	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Combinations	27.2	0.8	2.2	0.0	11.7	20.8	11.9	28.7
Combinations with Board[e]	32.6	0.0	0.0	0.0	0.0	3.9	7.1	1.1
Total Number of Modes	158	246	45	90	60	77	42	94

[a]B---T=Subject B and Teacher; [b]B---SP=Subject B and Speaking Peer; [c]B---NSP(S)=Subject B and Nonspeaking Peer (Spontaneous); [d]B---NSP(E) Subject B and Nonspeaking Peer (Elicited); [e]Percentage of combinations with board and one other mode calculated from the total number of modes.

interactions.

In terms of her communication partners, both the teacher (99.2%) and the speaking peer (100%) used the verbal mode more frequently than any other mode. For the nonspeaking peer, verbal, and gesture modes, as well as the combination of two or more modes predominated.

Communication Function. Subject B exhibited requests more frequently in all of the peer interactions, particularly the nonspeaking peer interactions, than in the teacher interaction (see Table 20). The most predominant type of request exhibited by Subject B in the nonspeaking peer interactions was request for action. In contrast, the most frequently occurring communication function exhibited by Subject B in the teacher interaction was responses to requests (74.6%). Play and affection only occurred in the peer interactions, and more play was exhibited in the speaking peer interaction (55.6%) than the nonspeaking peer interactions. Informatives and protests/disagreements were used more frequently with peers than with the teacher. Repetitions, self-repetitions, acknowledgements and combinations of two or more communication functions were exhibited infrequently across interactions.

With respect to Subject B's communication partners, the teacher primarily produced requests, specifically involving requests for information (50.0%) and repair (21.1%), followed by informatives (13.4%). The speaking peer primarily exhibited requests, specifically involving requests for

Table 20

Percentage of Communication Functions For Subject B and Her Respective Communication Partners Across Interactions

Communication Function	Participant Interaction							
	B---T[a]		B---SP[b]		B---NSP(S)[c]		B---NSP(E)[d]	
Request for Object	0.0	0.0	0.0	0.0	3.3	2.6	0.0	1.1
Request for Action	0.0	7.3	2.2	28.9	15.0	20.8	14.0	16.0
Request for Information	0.0	50.0	2.2	2.2	0.0	1.3	0.0	9.6
Request for Permission	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Request for Attention	0.0	0.0	4.4	34.4	5.0	27.3	4.7	19.2
Request for Repair	0.6	21.1	0.0	0.0	1.7	1.3	2.3	2.1
Indirect Request	0.6	0.8	0.0	2.2	0.0	1.3	2.3	5.3
Response to Requests	74.6	0.0	4.4	0.0	3.3	0.0	16.3	0.0
Protest/ Disagreement	0.6	0.4	2.2	1.1	20.0	2.6	20.9	4.3
Repetition	0.0	6.5	0.0	0.0	3.3	5.2	4.7	1.1

[a]B---T=Subject B and Teacher; [b]B---SP=Subject B and Speaking Peer; [c]B---NSP(S)=Subject B and Nonspeaking Peer (Spontaneous); [d]B---NSP(E)=Subject B and Nonspeaking Peer (Elicited).

(table continues)

Communication Function	Participant Interaction							
	B---T[a]		B---SP[b]		B---NSP(S)[c]		B---NSP(E)[d]	
Self-Repetition	0.6	0.8	2.2	11.1	1.7	1.3	4.7	5.3
Informative	4.1	13.4	8.9	16.7	15.0	5.2	16.3	7.5
Acknowledge-ment	6.0	3.7	2.2	0.0	6.7	1.3	2.3	1.1
Play	0.0	0.0	55.6	0.0	8.3	3.9	2.3	0.0
Affection	0.0	0.0	0.0	0.0	10.0	10.4	4.7	4.3
No Response	6.5	0.0	0.0	0.0	0.0	0.0	2.3	0.0
Uncodable	6.5	2.4	11.1	1.1	6.7	3.9	4.7	11.7
Combinations	0.0	1.2	0.0	1.1	0.0	11.7	2.3	12.8
Total Frequency of Functions	169	246	45	90	60	77	42	94

attention (34.4%) and action (28.9%), followed by informatives (16.7%). With respect to the nonspeaking peer, requests for attention and action were the primary functions exhibited.

Communicator Role. Subject B exhibited the initiator role more frequently in the peer interactions, particularly the nonspeaking peer interactions, than in the teacher interaction (see Table 21). The communication functions most frequently employed for her topic initiations with peers were: requests for action, information, and attention; informatives; and play (see Table 22).

Some type of initiation was exhibited by each of Subject B's communication partners. The teacher (94.1%) and the speaking peer (100%) employed the communication function of request for information for topic initiations. The nonspeaking peer primarily employed requests for attention and action, and combinations of two or modes to initiate topics in the two interactions.

Subject C

Communication Mode. Subject C primarily communicated verbally and gesturally across all interactions (see Table 23). In the nonspeaking peer, elicited interaction, the vocal mode (50.0%) was also prominent. With respect to board production, Subject C used his board more frequently in the speaking peer interaction (13.3%) than in the teacher interactions (10.1%). No board production was exhibited in

Table 21

Percentage of Communicator Roles For Subject B and Her Respective Communication Partners Across Interactions

Communicator Role	Participant Interaction							
	B---T[a]		B---SP[b]		B---NSP(S)[c]		B---NSP(E)[d]	
Initiator	0.8	3.0	9.4	0.0	14.6	16.7	10.3	17.9
Maintainer	96.3	86.6	84.4	96.7	78.1	83.3	79.3	57.1
Maintainer/ Initiator	0.0	6.7	0.0	3.3	0.0	0.0	10.3	14.3
Consecutive Initiator	0.0	1.5	0.0	0.0	0.0	0.0	0.0	3.6
Uncodable	3.0	2.2	6.3	0.0	7.3	0.0	0.0	7.1
Total Frequency of Turns	134	134	32	30	41	42	29	28

[a]B---T=Subject B and Teacher; [b]B---SP=Subject B and Speaking Peer; [c]B---NSP(S)=Subject B and Nonspeaking Peer (Spontaneous); [d]B---NSP(E)=Subject B and Nonspeaking Peer (Elicited).

Table 22

Percentage of Communication Functions Employed for Topic Initiations for Subject B and Her Respective Communication Partners Across Interactions

Communication Function	Participant Interaction							
	B---T[a]		B---SP[b]		B---NSP(S)[c]		B---NSP(E)[d]	
Request for Object	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.1
Request for Action	0.0	0.0	0.0	0.0	0.0	28.6	33.3	0.0
Request for Information	0.0	94.1	33.3	100	0.0	0.0	0.0	9.1
Request for Permission	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Request for Attention	0.0	0.0	33.3	0.0	33.3	42.9	33.3	45.5
Request for Repair	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Indirect Request	0.0	5.9	0.0	0.0	0.0	0.0	0.0	18.2
Response to Requests	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Protest/ Disagreement	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Repetition	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

[a] B---T=Subject B and Teacher; [b] B---SP=Subject B and Speaking Peer; [c] B---NSP(S)=Subject B and Nonspeaking Peer (Spontaneous); [d] B---NSP(E)=Subject B and Nonspeaking Peer (Elicited).

(table continues)

Communication Function	Participant Interaction							
	B---T[a]		B---SP[b]		B---NSP(S)[c]		B---NSP(E)[d]	
Self-Repetition	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Informative	100	0.0	0.0	0.0	33.3	0.0	16.7	0.0
Acknowledgement	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Play	0.0	0.0	33.3	0.0	33.3	0.0	16.7	0.0
Affection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
No Response	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Uncodable	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Combinations	0.0	0.0	0.0	0.0	0.0	28.6	0.0	18.2
Total Initiations	1	17	3	1	6	7	6	11

Table 23

Percentage of Communication Modes For Subject C and His Respective Communication Partners Across Interactions

Communication Mode	Participant Interaction C---T[a]		C---SP[b]		C---NSP(S)[c]		C---NSP(E)[d]	
Board	10.1	0.0	13.3	0.0	0.0	0.0	0.0	0.0
Other's Board	0.0	0.7	0.0	1.2	0.0	0.0	0.0	0.0
Verbal	31.2	82.0	42.2	76.6	44.4	50.0	33.3	0.0
Vocal	2.1	0.7	1.2	0.0	11.1	50.0	50.0	0.0
Gesture	22.8	0.7	1.2	0.0	33.3	0.0	16.7	0.0
Sign	1.6	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Combinations	32.3	14.9	42.2	22.9	11.1	0.0	0.0	0.0
Combinations with Board[e]	21.2	6.9	27.7	22.9	0.0	0.0	0.0	0.0
Total Number of Modes	189	289	83	166	9	2	6	0

[a]C---T=Subject C and Teacher; [b]C---SP=Subject C and Speaking Peer; [c]C---NSP(S)=Subject C and Nonspeaking Peer (Spontaneous); [d]C---NSP(E)=Subject C and Nonspeaking Peer (Elicited); [e]Percentage of combinations with board and one other mode calculated from the total number of modes.

either of the two nonspeaking peer interactions. Combinations of two or modes were exhibited frequently in the majority of the interactions. Specifically, combinations with board production occurred only in the teacher (21.2%) and the speaking peer interactions (27.7%). Use of the other's board and sign occurred infrequently across all interactions.

Communication Function. Subject C exhibited requests more frequently in all of the peer interactions than in the teacher interaction (see Table 24). The most predominant types of requests exhibited by Subject C in the peer interactions were requests for action, attention, and repair. In contrast, the most frequently occurring communication functions exhibited by Subject C in the teacher interaction were responses to requests (60.2%) and informatives (12.2%). Play only occurred in the speaking peer interaction (2.2%). The majority of Subject C's message units in the nonspeaking peer, elicited interaction was uncodable (66.7%). Protests/disagreements, repetitions, self-repetitions, acknowledgements, affection, and combinations of two or more communication functions occurred infrequently across interactions.

With respect to Subject C's communication partners, the teacher primarily produced requests, specifically involving requests for information (44.3%), followed by informatives (17.3%). The speaking peer primarily exhibited informatives (35.1%) and requests for information (31.5%). In the

Table 24

Percentage of Communication Functions For Subject C and His Respective Communication Partners Across Interactions

Communication Function	Participant Interaction							
	C---T[a]		C---SP[b]		C---NSP(S)[c]		C---NSP(E)[d]	
Request for Object	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Request for Action	0.0	4.5	0.0	1.8	44.4	0.0	0.0	0.0
Request for Information	3.1	44.3	3.4	31.5	0.0	0.0	0.0	0.0
Request for Permission	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0
Request for Attention	2.1	1.4	15.7	1.2	22.2	0.0	16.7	0.0
Request for Repair	3.1	8.0	12.4	1.8	0.0	0.0	0.0	0.0
Indirect Request	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0
Response to Requests	60.2	2.8	25.8	3.6	0.0	0.0	0.0	0.0
Protest/ Disagreement	4.1	4.5	3.4	0.6	11.1	0.0	0.0	0.0
Repetition	1.0	4.2	0.0	1.2	0.0	0.0	0.0	0.0

[a]C---T=Subject C and Teacher; [b]C---SP=Subject C and Speaking Peer; [c]C---NSP(S)=Subject C and Nonspeaking Peer (Spontaneous); [d]C---NSP(E)=Subject C and Nonspeaking Peer (Elicited).

(table continues)

Communication Function	Participant Interaction C---T[a]		C---SP[b]		C---NSP(S)[c]		C---NSP(E)[d]	
Self-Repetition	1.0	2.1	3.4	3.0	11.1	0.0	0.0	0.0
Informative	12.2	17.3	16.9	35.1	0.0	0.0	0.0	0.0
Acknowledgement	4.1	3.5	6.7	1.8	0.0	0.0	0.0	0.0
Play	0.0	0.0	2.2	3.6	0.0	0.0	0.0	0.0
Affection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
No Response	3.6	0.0	6.7	1.2	0.0	0.0	0.0	0.0
Uncodable	3.6	2.8	4.5	12.5	11.1	100	66.7	0.0
Combinations	0.5	4.5	5.6	1.2	0.0	0.0	16.7	0.0
Total Frequency of Functions	196	289	89	168	9	2	6	0

nonspeaking peer, spontaneous interaction, all message units exhibited by Subject C's communication partner were uncodable. No message units were exhibited by the nonspeaking peer in the elicited interaction.

Communicator Role. Subject C did not exhibit any type of initiator role (i.e., initiator, maintainer/initiator, or consecutive initiator) in the teacher interactions (see Table 25). In contrast, he did exhibit the initiator role in both the speaking peer (9.9%) and the nonspeaking peer, spontaneous interaction (50.0%). No initiations were exhibited in the other nonspeaking peer interaction. The communication functions most frequently employed for his topic initiations with peers were requests for action and attention, and informatives (see Table 26).

Initiations were exhibited only by the teacher and the speaking peer. The teacher primarily employed the communication functions of requests for information (76.9%) and action (15.4%) for topic initiations. Requests for information (40.0%) and informatives (40.0%) were primarily employed by the speaking peer to initiate topics.

Subject D

Communication Mode. Communication mode usage for Subject D varied across the interactions (see Table 27). Specifically, in the teacher interaction, the primary modes included board (29.2%) and gesture (32.6%). In the speaking peer interaction, Subject D primarily used board (63.6%) and

Table 25

Percentage of Communicator Roles For Subject C and His Respective Communication Partners Across Interactions

Communicator Role	Participant Interaction							
	C---T[a]		C---SP[b]		C---NSP(S)[c]		C---NSP(E)[d]	
Initiator	0.0	3.7	9.9	12.5	50.0	0.0	0.0	0.0
Maintainer	98.1	90.7	88.7	79.1	0.0	0.0	0.0	0.0
Maintainer/ Initiator	0.0	3.1	0.0	1.4	0.0	0.0	0.0	0.0
Consecutive Initiator	0.0	0.6	0.0	0.0	50.0	0.0	100	0.0
Uncodable	1.9	1.9	1.4	6.9	0.0	100	0.0	0.0
Total Frequency of Turns	161	162	71	72	2	2	1	0

[a] C---T=Subject C and Teacher; [b] C---SP=Subject C and Speaking Peer; [c] C---NSP(S)=Subject C and Nonspeaking Peer (Spontaneous); [d] C---NSP(E)=Subject C and Nonspeaking Peer (Elicited).

Table 26

Percentage of Communication Functions Employed for Topic Initiations for Subject C and His Respective Communication Partners Across Interactions

Communication Function	Participant Interaction C---T[a]		C---SP[b]		C---NSP(S)[c]		C---NSP(E)[d]	
Request for Object	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Request for Action	0.0	15.4	0.0	0.0	66.7	0.0	0.0	0.0
Request for Information	0.0	76.9	0.0	40.0	0.0	0.0	0.0	0.0
Request for Permission	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Request for Attention	0.0	0.0	57.1	0.0	33.3	0.0	50.0	0.0
Request for Repair	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Indirect Request	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0
Response to Requests	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Protest/ Disagreement	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Repetition	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

[a] C---T=Subject C and Teacher; [b] C---SP=Subject C and Speaking Peer; [c] C---NSP(S)=Subject C and Nonspeaking Peer (Spontaneous); [d] C---NSP(E)=Subject C and Nonspeaking Peer (Elicited).

(table continues)

Communication Function	Participant Interaction C---T[a]		C---SP[b]		C---NSP(S)[c]		C---NSP(E)[d]	
Self-Repetition	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Informative	0.0	0.0	42.9	40.0	0.0	0.0	0.0	0.0
Acknowledge-ment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Play	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0
Affection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
No Response	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Uncodable	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Combinations	0.0	7.7	0.0	0.0	0.0	0.0	50.0	0.0
Total Initiations	0	13	7	10	3	0	2	0

Table 27

Percentage of Communication Modes For Subject D and Her Respective Communication Partners Across Interactions

Communication Mode	Participant Interaction D---T[a]		D---SP[b]		D---NSP(S)[c]		D---NSP(E)[d]	
Board	29.2	0.0	63.6	0.0	0.0	0.0	0.0	0.0
Other's Board	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0
Verbal	13.5	96.5	18.2	72.3	50.0	44.4	0.0	33.3
Vocal	13.5	0.5	9.1	13.9	50.0	11.1	0.0	50.0
Gesture	32.6	0.5	9.1	0.0	0.0	33.3	0.0	16.7
Sign	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Combinations	11.2	1.5	0.0	20.0	0.0	11.1	0.0	0.0
Combinations with Board[e]	1.1	1.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Number of Modes	89	202	11	65	2	9	0	6

[a]D---T=Subject D and Teacher; [b]D---SP=Subject D and Speaking Peer; [c]D---NSP(S)=Subject D and Nonspeaking Peer (Spontaneous); [d]D---NSP(E)=Subject D and Nonspeaking Peer (Elicited); [e]Percentage of combinations with board and one other mode calculated from the total number of modes.

verbal (18.2%) modes. Few message units were exhibited in the nonspeaking peer, spontaneous interaction, and no message units were exhibited in the remaining nonspeaking peer interaction. Board production was exhibited only in the teacher and speaking peer interactions. Use of the other's board and combinations of two or more modes occurred infrequently across all interactions.

In terms of her communication partners, both the teacher (96.5%) and the speaking peer (72.3%) used the verbal mode more frequently than any other mode. For the nonspeaking peer, the verbal, vocal, and gesture modes predominated.

Communication Function. Subject D exhibited requests more frequently in the speaking peer interaction (9.0%) than in the teacher interaction (1.7%) (see Table 28). No requests were exhibited in either of the nonspeaking peer interactions. The most frequently occurring communication functions exhibited by Subject D in the teacher interaction were responses to requests (56.0%) and no responses (24.6%). Protests/disagreements, repetitions, self-repetitions, informatives, acknowledgements, play, affection, and combinations of two or more communication functions occurred infrequently the teacher and speaking peer interactions. Again, few message units were exhibited in the nonspeaking peer interactions.

With respect to Subject D's communication partners, the teacher primarily produced requests, specifically involving

Table 28

Percentage of Communication Functions For Subject D and Her Respective Communication Partners Across Interactions

Communication Function	Participant Interaction D---T[a]		D---SP[b]		D---NSP(S)[c]		D---NSP(E)[d]	
Request for Object	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Request for Action	0.0	2.0	4.5	4.6	0.0	44.4	0.0	0.0
Request for Information	1.7	53.5	0.0	46.2	0.0	0.0	0.0	0.0
Request for Permission	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0
Request for Attention	0.0	0.5	0.0	0.0	0.0	22.2	0.0	16.7
Request for Repair	0.0	12.4	4.5	9.2	0.0	0.0	0.0	0.0
Indirect Request	0.0	1.5	0.0	4.6	0.0	0.0	0.0	0.0
Response to Requests	56.0	0.0	27.3	0.0	0.0	0.0	0.0	0.0
Protest/ Disagreement	1.7	0.0	0.0	0.0	0.0	11.1	0.0	0.0
Repetition	0.8	2.0	0.0	0.0	0.0	0.0	0.0	0.0

[a]D---T=Subject D and Teacher; [b]D---SP=Subject D and Speaking Peer; [c]D---NSP(S)=Subject D and Nonspeaking Peer (Spontaneous); [d]D---NSP(E)=Subject D and Nonspeaking Peer (Elicited).

(table continues)

Communication Function	Participant Interaction D---T[a]		D---SP[b]		D---NSP(S)[c]		D---NSP(E)[d]	
Self-Repetition	1.7	0.5	0.0	7.7	0.0	11.1	0.0	0.0
Informative	0.8	15.9	0.0	13.9	0.0	0.0	0.0	0.0
Acknowledge-ment	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0
Play	0.0	0.0	0.0	7.7	0.0	0.0	0.0	0.0
Affection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
No Response	24.6	0.0	50.0	0.0	0.0	0.0	0.0	0.0
Uncodable	7.2	7.9	13.7	27.3	100	11.1	0.0	66.7
Combinations	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.7
Total Frequency of Functions	118	202	22	65	2	9	0	6

requests for information (53.5%) and repair (12.4%), and also informatives (15.9%). The speaking peer primarily exhibited requests for information (46.2%), informatives (13.9%), and message units that were uncodable (27.3%). With respect to the nonspeaking peer, requests for action (44.4%; 4/9) and attention (22.2%; 2/9), and message units that were uncodable (66.7%; 4/6) were the most frequently exhibited functions.

Communicator Role. Subject D occupied the initiator role more frequently in the speaking peer interaction (9.1%) than in the teacher interaction (2.5%) (see Table 29). No initiations were exhibited in either of the nonspeaking peer interactions. The communication function most frequently employed for her topic initiations were requests for action (100%) and information (66.7%), and informatives (33.3%) (see Table 30).

Initiations were exhibited by each of Subject D's communication partners. The teacher employed only the communication function of request for information (100%) for topic initiations. Requests for information (50.0%) and play (37.5%) were primarily employed by the speaking peer to initiate topics. The nonspeaking peer primarily employed requests for action and attention, and combinations of two or more communication functions for topic intitations in the two interactions.

Table 29

Percentage of Communicator Roles For Subject D and Her Respective Communication Partners Across Interactions

Communicator Role	Participant Interaction							
	D---T[a]		D---SP[b]		D---NSP(S)[c]		D---NSP(E)[d]	
Initiator	2.5	0.0	9.1	16.7	0.0	50.0	0.0	0.0
Maintainer	83.8	92.6	63.6	50.0	0.0	0.0	0.0	0.0
Maintainer/ Initiator	1.3	4.9	0.0	16.7	0.0	0.0	0.0	0.0
Consecutive Initiator	0.0	1.2	0.0	16.7	0.0	50.0	0.0	100
Uncodable	12.5	1.2	27.3	0.0	100	0.0	0.0	0.0
Total Frequency of Turns	80	81	11	12	2	2	0	1

[a] D---T=Subject D and Teacher; [b] D---SP=Subject D and Speaking Peer; [c] D---NSP(S)=Subject and Nonspeaking Peer (Spontaneous); [d] NSP(E)=Subject D and Nonspeaking Peer (Elicited).

Table 30

Percentage of Communication Functions Employed for Topic Initiations for Subject D and Her Respective Communication Partners Across Interactions

Communication Function	Participant Interaction							
	D---T[a]		D---SP[b]		D---NSP(S)[c]		D---NSP(E)[d]	
Request for Object	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Request for Action	0.0	0.0	100	0.0	0.0	66.7	0.0	0.0
Request for Information	66.7	100	0.0	50.0	0.0	0.0	0.0	0.0
Request for Permission	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Request for Attention	0.0	0.0	0.0	0.0	0.0	33.3	0.0	50.0
Request for Repair	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Indirect Request	0.0	0.0	0.0	12.5	0.0	0.0	0.0	0.0
Response to Requests	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Protest/ Disagreement	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Repetition	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

[a] D---T=Subject D and Teacher; [b] D---SP=Subject D and Speaking Peer; [c] D---NSP(S)=Subject D and Nonspeaking Peer (Spontaneous); [d] D---NSP(E)=Subject D and Nonspeaking Peer (Elicited).

(table continues)

Communication Function	Participant Interaction							
	D---T[a]		D---SP[b]		D---NSP(S)[c]		D---NSP(E)[d]	
Self-Repetition	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Informative	33.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Acknowledgement	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Play	0.0	0.0	0.0	37.5	0.0	0.0	0.0	0.0
Affection	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
No Response	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Uncodable	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Combinations	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0
Total Initiations	3	6	1	8	0	3	0	2

THE COMMUNICATIVE PERFORMANCE OF NONSPEAKING ADOLESCENTS ACROSS VARIOUS PARTICIPANT INTERACTIONS

by

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Abstract

THE COMMUNICATIVE PERFORMANCE OF NONSPEAKING ADOLESCENTS ACROSS VARIOUS PARTICIPANT INTERACTIONS

This study examined the communicative performance of four nonspeaking adolescents across various participant interactions. The subjects, two males and two females, ranging in age from 14.9 to 18.6 years, were selected from a residential school for individuals with muscular disabilities. All subjects were functioning within Piaget's (1964) preoperational period of cognitive development with comparative levels of language comprehension. Each subject used a communication board with a direct selection system. The boards consisted of a range of 152 to 242 cartoon-like symbols with corresponding English orthographic symbols. For each subject, a 15-minute videotaped recording was made of his/her communicative performance while interacting in a speech therapy room with: a teacher, a familiar speaking peer, and a familiar nonspeaking peer in both a spontaneous and elicited situation. The order of the interactions was counterbalanced across subjects. Across interactions, communication board symbol productions, verbalizations, vocalizations, signs (for one subject only), and gestures displaying communicative intent were transcribed and coded for communication mode, function, and communicator role. The results of the study indicated that the primary communication modes exhibited by the majority of subjects across interactions involved verbal and gesture. With regard to board production, each subject used his/her board more

frequently in one of the peer interactions than in the teacher interaction. With the teachers, the majority of subjects exhibited verbal production more frequently than any other mode. As expected, the primary communication function exhibited by all subjects in the teacher interactions involved responses. In contrast, with peers, particularly nonspeaking peers, requests predominated. In terms of other communication functions, informatives were used more frequently with speaking peers than with teachers. Play and affection were only exhibited in the peer interactions. All subjects were initiators more frequently in interactions with peers than teachers, although topics were maintained over a greater average number of turns with teachers than with peers. With speaking peers, topics were maintained over a greater average number of turns than with nonspeaking peers. A further analysis of communication mode and function employed for topic initiations was also conducted. Specifically, symbol modes (i.e., board or verbal) were used more frequently to initiate topics with teachers and speaking peers than with nonspeaking peers. Across interactions, the primary communication function used to initiate topics involved requests followed by informatives. Clinical implications are discussed.