

Response of Mothers to the Nonverbal Communication of their Hearing-Impaired Children

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A research project designed to analyze the responses of mothers to the non-verbal communication of their hearing-impaired children is discussed. It appears that the majority of nonverbal communication attempts of the two hearing-impaired children who served as subjects in this study was treated as communicative by the mothers. That is, the mothers either responded (verbally and/or nonverbally) to the children's attempts and/or directly translated the nonverbal messages of their children into conventional linguistic symbols. However, a substantial number of communicative attempts were completely ignored by the mothers, particularly the mother of one subject, who failed to acknowledge approximately one-third of her child's communicative attempts. There appeared to be a difference in the responses of the mothers to the various pragmatic intents and semantic functions expressed nonverbally by their children. Ramifications for the acquisition of communicative competence by hearing-impaired children are discussed.

The literature of the past ten years pertaining to the acquisition of verbal language by hearing-impaired children has firmly established a number of concerns. The profound delays in language abilities of severely hearing-impaired children have received considerable attention and have been well described. In view of the numerous problems in language acquisition by hearing-impaired children that have been described in recent years, it appears critical now to begin documenting the factors that may serve to facilitate or impede speech and language development in hearing-impaired children.

Recent studies by Aungst and Kricos (Note 1), Curtiss, Prutting, and Lowell (1979), and Skarakis and Prutting (1977) have suggested that natural gestural communication is the dominant mode of communication for preschool deaf children. These studies have documented the extensive use of

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nonverbal communication by deaf preschoolers to express a variety of concepts and intents to their primary caregivers.

Skarakis and Prutting (1977) utilized a sociolinguistic approach to describe the semantic-pragmatic components in the spontaneous verbal and nonverbal communication of four profoundly hearing-impaired preschool children. Greenfield and Smith's (1976) 13 categories of semantic and Dore's (1974) eight categories of communicative intent were used. Results revealed that the subjects were exhibiting semantic functions and communicative intents in spontaneous communication and that these were the same as those previously identified in younger normal-hearing children by Dore (1974) and Greenfield and Smith (1976). The four hearing-impaired children appeared to have substantial usage of the pragmatic level of language, while their communication on the semantic level predominantly consisted of pre-linguistic semantic functions.

Curtiss et al. (1979) attempted to characterize the early pragmatic-semantic communicative development of 12 hearing-impaired children, 22 months to 60 months of age, through analysis of approximately 12 hours of videotaped data. One of their major findings was that hearing-impaired children code a variety of pragmatic intentions and semantic functions both verbally and nonverbally. Results again revealed differences in the development of semantic and pragmatic abilities. The pragmatic ability developed first and more quickly than the semantic ability. Semantic usage, however, increased with age.

The results of a study of five hearing-impaired preschoolers by Aungst and Kricos (Note 1) indicated that the cognitive, gestural, and spoken English development of hearing-impaired children appear to be interrelated. An in-depth interview of the parents of these children revealed that the parents were not always sensitive to many of the communicative behaviors of their children. Parents often failed to identify as communicative those behaviors of their children that were intentional acts of communication but were not expressed using conventional words or gestures. The authors also noted that hearing-impaired children in their home environment produced a higher rate of gestural communication attempts than in a nursery school setting. The results of this investigation lead to two important clinical implications. First, the data suggests that situations for language learning in the home environment should be carefully arranged to optimize hearing-impaired children's opportunities for communicative interchanges with their families. Second, the findings highlight the need to train parents to identify their children's communicative attempts as well as to facilitate their children's development from nonlinguistic to linguistic forms of communication.

Research with normal-hearing children has suggested that speech and language develop from early nonlinguistic communication acts in the context of conversations and joint activities between the child and her/his "significant

others” (Bates, 1976; Lewis & Rosenblum, 1972; Moerk, 1976; Snow, 1972). Therefore, the use of nonverbal communication by hearing-impaired children and their mothers’ responses to these communication attempts appear to be areas in critical need of study.

Although the use of nonverbal communication by the preschool hearing-impaired child has been described by several authors, there has been a lack of research describing the specific ways in which the primary caregivers respond to the hearing-impaired child’s attempts to communicate nonverbally. A number of authors, however, have expressed concern regarding the detrimental effect that knowledge of a child’s hearing handicap may have upon the mother’s communication interaction style with her child.

Goss (1970) delineated striking differences between the verbal behavior of mothers of deaf children and mothers of hearing children. His results suggested that mothers of deaf children are less likely to use verbal praise, to ask for opinions and suggestions, and to use questions, and more likely to show disagreement, tension, and antagonism, and to give more suggestions, than mothers of hearing children. Schlesinger (1972) and Meadow, Schlesinger, and Holstein (1972) have expressed concern that parents of hearing-impaired infants may be so intent on providing language stimulation that they may fail to respond playfully and in an interactive way in communication situations with their children:

Every opportunity to teach language was seized upon with a vigor that often precluded pleasure and enjoyment. Rather than building a structure with the blocks, or encouraging the child to find his own activity with the blocks, many of the mothers of deaf children used the blocks as a way of eliciting the names of colors. Many of these mothers insisted that the child *say* the color of a cup, *say* “please” or “thank you”, or *ask* for a cookie before they allowed him to have refreshments. This reflects the kind of instructions that teachers frequently give mothers, or show them by examples. (Meadow, Schlesinger, and Holstein, 1972, p. 109)

Moses and Van Hecke-Wulatin (1981) have also described the problems that mothers may experience in attempting to interact playfully and positively with their hearing-impaired infants:

On her part, the impaired infant’s mother or caregiver may be less able to engage in the reciprocity which is the cornerstone of attachment. Her own emotional reactions to having an impaired child may make it difficult for her to respond as positively or playfully to the infant as she might otherwise. She may less frequently experience her interactions as having an effect on the child, interfering with her ability to experience the relationship as reciprocal. (p. 247)

Several authors have suggested the value of considering the hearing-impaired child’s prelinguistic, gestured communication in designing parent-infant language intervention programs. Lowell and Lowell (1978) recommend that the hearing-impaired child be stimulated with linguistic

symbols for concepts the child has expressed nonverbally, rather than with linguistic symbols arbitrarily chosen by the teacher or parents. The desirability of responding conversationally to the hearing-impaired child's gestures and vocalizations has also been described by Boothroyd (1982). In describing how mothers of hearing-impaired children can converse with their speechless children, van Uden (1979) has emphasized the value of what he refers to as the "seizing method" and "playing the double part." Using these techniques, mothers of hearing-impaired infants would attempt to "seize" or grasp what the child is attempting to communicate nonverbally and/or through vocalization, label the communication attempts with linguistic symbols, and then respond conversationally to the child's communication attempts.

Because of the prevalence of nonverbal communication in deaf preschoolers and the assumed relationship between early nonverbal communication attempts and subsequent speech and language development in normal-hearing children, it is critical that responses of mothers to the nonverbal and verbal communication attempts of their hearing-impaired children be evaluated. For the past several years the author has been collecting data regarding the use of nonverbal communication by hearing-impaired children under the age of five years. This paper will describe mothers' responses to their two two-year-old profoundly hearing-impaired children's nonverbal communication attempts. The purpose of this research was to delineate what it is that mothers of very young deaf children do when responding to their children's nonverbal communication acts that may serve to facilitate or impede speech and language development. Of specific interest was determination of any response patterns used by the mother to respond to her child's nonverbal communication; i.e., are her utterances related to the child's nonverbal communication attempts? Does she ignore, respond to, and/or translate into linguistic symbols what the child is attempting to communicate nonverbally? Does she respond differently depending on the semantic function and/or pragmatic intents expressed by the child? The answers to these questions may have a number of implications for facilitating language development in young hearing-impaired children.

METHOD

Subjects

Two mothers and their hearing-impaired preschoolers who receive bi-weekly individual and group therapy at the University of Florida Speech and Hearing Clinic served as subjects. Subject One was 24 months of age at the beginning of this study. He has a bilateral profound loss of hearing, presumed to be congenital with unknown etiology. He received amplification and was enrolled in aural habilitation therapy at 15 months of age. There are no other known handicaps other than deafness. Subject One, at the time of

this study, used gestures and vocalizations to communicate, with no true words except approximation of the word "bye-bye".

Subject Two was 26 months at the beginning of the project and has a profound loss of hearing bilaterally, presumed to be congenital with unknown etiology and no other known handicaps. He has been enrolled in therapy since the age of 19 months and received binaural amplification at that time. He communicates through the use of gestures, vocalization, and some spontaneous word approximations, including "mama", "out", and "up".

Collection of Data

Each mother-child dyad was videotaped in a large group therapy room once a week over a four week period, with each of the four taping sessions lasting approximately 30 minutes. The videotape equipment consisted of a Bell and Howell Model 2962 camera with a Fujinon ITV zoom lens, a Sony Dynamic-Microphone F-500 suspended from the ceiling of the therapy room, an Ampex black/white monitor, and a Sony AV-3650 black/white reel-to-reel videotape recorder. The latter piece of equipment was ideal for this type of research because of its slow-motion playback capabilities. All videotaping occurred through the therapy room's one-way observation mirror and thus neither child nor mother was distracted by the presence of recording equipment or the examiner. The carpeted therapy room was made as comfortable and child-oriented as possible. To increase the chances of mother-child interaction, several boxes of toys and game activities were provided and the mother was encouraged to play with her child during the taping sessions. Both mothers reported that they did not feel uncomfortable during the taping and that their children behaved and played in a fashion fairly typical of their behavior in a more homelike setting.

Analysis Procedures

Following the collection of videotaped mother-child interactions, the videotapes were reviewed by the investigator. All communicative interactions and the play situations in which they occurred were transcribed. The transcripts were then reviewed to identify every communicative act performed by the child. Once identified, these acts were coded three ways:

1. Whether the act was verbal (Ve), nonverbal (NV), or nonverbal accompanied by verbalization or vocalization (NV + Ve, NV + Vo). Verbalization was defined as an attempt to use or approximate spoken language. Nonverbal was defined as gestures, facial expressions, eye contact, and body movements that may have communicative impact and/or intent.
2. The pragmatic intention of the communicative act, using a modified version of Dore's (1974) communicative intent categories.
3. The semantic content of the communicative act, using a modified ver-

sion of Greenfield and Smith's (1976) semantic function categories.

The responses of the mothers to each of the children's communicative acts were then analyzed into one of the following six categories:

1. Ignore (I): mother failed to respond to or acknowledge in any way the child's communicative attempts.
2. Response: verbal (RV) indicating mother acknowledged the child's communicative attempt by verbally responding to it (e.g., Subject Two walks toward door of therapy room and makes circular, calling motion with his arm, while vocalizing "'Mon, 'Mon". Mother: "No. Not yet. Let's pick up the puzzle, okay?").
3. Response: nonverbal [R(NV)] indicating mother acknowledged the child's communicative attempt by nonverbally responding to it (e.g., Subject One gestures and vocalizes /mum mum mum/ for mother to hand him the baby doll and mother hands it to him).
4. Response: verbal and nonverbal [R(both)] indicating mother responds both verbally and nonverbally to the child's communicative attempt (e.g., Subject Two reaches for toy ironing board and vocalizes and mother hands it to him, saying: "There we go! Do you need a blanket? Do you need something to iron?").
5. Translation (T): indicating mother directly translates or attempts to translate into conventional linguistic symbols what the child is attempting to communicate using unconventional, nonverbal means (e.g., Subject Two tries to open play lunchbox, shakes it, and hands it to mother with vocalization. Mother: "You want me to open? Open?").
6. Translation and response (T + R): indicating mother directly translates the child's communicative attempt and then responds to it either verbally, nonverbally, or both (e.g., Subject One holds a play orange by his mouth, then picks up a play apple, hands it to mother, and points to her mouth. Mother: "You want me to eat it? I can't. It's too hard. It's just pretend.").

RESULTS

A summary of the subject's nonverbal and verbal communicative acts and the mothers' responses to these attempts is displayed in Table 1. Over four videotaping sessions, Subject One made a total of 139 nonverbal communicative attempts, an average of approximately 34.8 attempts per session. Eighty-four (60.4%) of his communicative attempts consisted on nonverbal communication alone. Fifty-three (38.1%) of his communicative attempts consisted of nonverbal communication combined with vocalization. Only two of Subject One's attempts combined nonverbal with verbal communication, and no attempts were made to use verbal communication acts alone. All of the categories for mother's responses except the "Ignore" category

would indicate that the child's communicative attempt was treated as communicative. It can be seen that Subject One's mother treated the majority (68.2%) of his attempts as communicative (responded to and/or translated). However, almost one third (31.7%) of his communicative attempts were ignored and only a little over one-fourth (28.7%) were verbally translated (or translated and responded to).

Subject Two made a total of 162 nonverbal communicative attempts, an average of approximately 40.5 attempts per session. Seventy-two (44.4%) acts were nonverbal-alone attempts, eighty-five (52.5%) were nonverbal attempts combined with vocalization, and five were nonverbal combined with verbal attempts. The majority (79.7%) of Subject Two's attempts were treated as communicative (responded to and/or translated). In contrast to Subject One, only approximately one-fifth (20.4%) of Subject Two's communication attempts were ignored, and over one-half were verbally translated (or translated and responded to).

Table 1

Summary of Mothers' Responses to the Nonverbal Communication Attempts of Their Hearing-Impaired Children. Numbers Represent the Percentage of Times that Each of the Mothers' Response Categories was Exhibited for the Type of Communicative Attempt Made by the Child.

Subject	I ^a	R(V) ^a	R(NV) ^a	R(both) ^a	T ^a	T+R ^a
ONE:						
139 Total Non-verbal attempts	31.7%	18.7%	8.6%	12.2%	20.1%	8.6%
84 NV alone ^b	39.6%	14.3%	5.9%	11.9%	22.6%	8.3%
53 NV + Vo ^b	24.5%	24.5%	13.2%	11.3%	17.0%	9.4%
2 NV + Ve ^b	0	50.0%	0	50.0%	0	0
TWO:						
162 Total Non-verbal attempts	20.4%	9.3%	6.8%	8.6%	48.8%	6.2%
72 NV alone ^b	25.0%	12.5%	5.5%	8.3%	43.0%	5.5%
85 NV + Vo ^b	17.6%	5.9%	8.2%	9.4%	51.8%	7.0%
5 NV + Ve ^b	0	20.0%	0	0	80.0%	0

^aAbbreviations: I = Ignore
R(V) = Response: verbal
R(NV) = Response: nonverbal
R(both) = Response: verbal and nonverbal
T = Translation
T+R = Translation and response

^bAbbreviations: NV alone = Nonverbal alone
NV + Vo = Nonverbal + vocalization
NV + Ve = Nonverbal + verbalization

Table 2 shows the difference in the mothers' response patterns as a function of whether the children's nonverbal attempts were accompanied by vocalization or verbalization, or not. For both mothers, there was a tendency to ignore a larger percentage of nonverbal-alone communication attempts and to treat as communicative a larger percentage of nonverbal attempts accompanied by vocalization or verbalization.

Table 2
Mothers' Response Patterns as a Function of Whether the Children's
Nonverbal Attempts were Accompanied by Vocalization or Verbalization, or not.

Subject	NV Alone ^a	NV + Vo (or Ve) ^a
ONE:		
Ignored	36.9%	23.6%
Treated as communicative ^b	63.0%	76.3%
TWO:		
Ignored	25.0%	16.7%
Treated as communicative ^b	74.8%	83.3%

^aNV = Nonverbal, NV + Vo = Nonverbal + vocalization, Ve = Verbalization.

^b"Treated as communicative" means the mother either responded to the child's communicative attempt (verbally and/or nonverbally) or translated (and/or responded) to the attempt.

Only one of the children (Subject Two) produced verbalization-alone communication acts. This occurred four times over the four taping sessions. All four verbalization-alone attempts were treated by Subject Two's mother as communicative (two were directly translated, one was responded to verbally, and one was responded to nonverbally).

Of interest to the investigator was the determination of whether the mothers respond differently depending on the pragmatic intents and/or semantic functions expressed by the child. Pragmatic intent refers to why a child chooses to communicate, i.e., his underlying intention which enables him to plan his communication so that it does what he wants it to do. The following intents were originally proposed by Dore (1974) and are presented as modified by Curtiss et al. (1979).

Demand. A request for an action or an object. ("I want glue."; "More juice.")

Command. An imperative. ("Look at me."; "Come here.")

Question. A request for information or elaboration. ("Who?"; "What?"; "Huh?")

Labeling. Identification of a person, object, or action. ("That's a chair."; "Here's Jose.")

Response to a question. An act directly following a question posed to

the child. (Head shake, change of topic, an answer to a question.)

Response to a summons. An act directly following a summons for the child's attention. (Head turn, eye contact.)

Response to a command. An act directly following an imperative or request issued to the child. (Child follows directions, child changes topic.)

Imitation. An imitation of act or utterance performed by someone else.

Repetition. An imitation of a child's own act or utterance.

Summons. A request/demand for attention. (A wave, tap on the arm, calling someone's name.)

Description. An act describing an event, a person, or an object. ("He's tall."; "It fell down.")

Protesting. An act expressing resistance. ("No!"; vehement head shake; physical resistance.)

Ritual. A greeting, or other social ritual. ("Hi."; "Bye-bye.")

Request for approval. An act requesting approval from another person. ("Is it all right for me to do this?"; "Was that all right?")

Request for confirmation or acknowledgment. An act requesting another to confirm or acknowledge the child's behavior. ("Do you understand?"; "Did you hear me?")

Acknowledgment. An act evidencing comprehension of a situation, event, or message.

The patterns of the mothers' responses to the pragmatic intents expressed nonverbally by Subjects One and Two are shown in Tables 3 and 4 respectively. The three pragmatic categories used most frequently were identical for both subjects: demands, labeling, and description. These categories were among the five categories expressed most frequently by the subjects in Curtiss et al. (1979).

For Subject One, the categories of description and protesting were highly treated as communicative (at least 75% of the time) by his mother. For Subject Two, five categories were highly treated as communicative by his mother: demand, question, labeling, imitation, and request for approval. High "ignore" rates (>25%) were obtained for Subject One's mother for the categories demand, labeling, and ritual. It is interesting to note that while Subject One's mother tended to ignore the demand and labeling categories at a high rate, these same categories were highly treated as communicative by Subject Two's mother.

High rates (at least 75%) of translating responses were made by Subject Two's mother to the pragmatic intent categories of imitation and request for approval. Subject One's mother did not use a high rate of translating responses for any of the pragmatic intent categories.

The semantic function of a communicative act refers to the "social overlay" of a message, i.e., how the child uses the meaning of language to express his intentions. The following semantic functions were proposed by Greenfield

Table 3

Pattern of Mother's Responses to the Pragmatic Intents Expressed by Subject One. Numbers in Columns Represent the Percentage of Times a Response Category was Used for Each Pragmatic Intent.

Number of Times Expressed	I ^a	T (T+R) ^a	R ^a	Treated as Communicative ^b
63 Demand Command ^c Question ^c	33.3	25.4	41.3	66.7
27 Labeling Response to a question ^c Response to a summons Response to a command ^c Imitation Repetition Summons ^c	37.0	29.6	33.3	62.9
15 Description	13.3	66.7	20.0	86.7
8 Protesting	12.5	0	87.5	87.5
11 Ritual Request for approval ^c Request for confirmation or acknowledgment ^c Acknowledgment ^c	63.6	36.4	0	36.4

^aI = Ignore, T = Translation, T+R = Translation and Response, R = Response.

^bSum of second and third columns.

^cCategory was expressed by child at least once but less than four times and therefore percentage not calculated.

and Smith (1976) and modified in a previous study by Curtiss et al. (1979). Further modifications for the present study are noted.

Performative. Utterances, gestures, or vocalizations (acts) which occur as part of a child's actions ("Bye-bye"; waving), routines (pat-a-cake), or any gesture or utterance without specified semantic content.

Locate/Name. An act pointing out and/or naming. (Child points to dog and says "Doggie.") Named object or person must be present.

Object. An act focusing on the object of an action — always inanimate. (Stevie throws a ball and says "Ball." Leslie says "Milk," while Gina is drinking milk; someone turns on a light and David says "Light.")

Dative. An act focusing on the recipient or experiencer of an action — always animate. (Stevie kicks David and says "David."; Tommy gives a

Table 4

Patterns of Mother's Responses to the Pragmatic Intents Expressed by Subject Two. Numbers in Columns Represent the Percentage of Times a Response Category was Used for Each Pragmatic Intent.

Number of Times Expressed	I	T (T+R)	R	Treated as Communicative ^b
62 Demand Command ^a	16.1	48.4	35.5	83.9
13 Question	7.7	69.2	23.1	92.3
25 Labeling	16.0	64.0	20.0	84.0
13 Response to a question	38.5	30.8	30.8	61.6
Response to a summons				
Response to a command ^a				
5 Imitation Repetition ^a Summons ^a	20.0	80.0	0	80.0
16 Description Protesting ^a	25.0	68.8	6.2	75.0
9 Ritual	44.4	44.4	11.1	55.5
5 Request for approval	0	80.0	20.0	100.0
7 Request for confirmation or acknowledgment	28.6	57.1	14.3	71.4
Acknowledgment ^a				

^aCategory was expressed by child at least once but less than four times and therefore percentage not calculated.

^bSum of second and third column.

book to his mother and says "Mama.")

Object associated with another object or location. An act focusing on an object (usually not present) which is linked to an object which is present. (Pointing to a glass and saying "Milk."; pointing to a tree and saying "Bird."; pointing to foot and saying "Shoe.")

Animated association. An act focusing on a person in connection with an object. ("Mine."; Leslie points to Gina's painting and says "Gina."; Alyssa points to her mother's hat and says "Mommy."; Nicholas points to a picture of Curtis and says "Curtis.")

Locative. An act expressing or focusing on the location of an object or person. (Stevie puts the ball on the chair and says "On chair." or "Chair."; a bird flies up in a tree and child says "Tree.")

Aspect (of an event). An expression modifying a whole event.

("More."; "All done."; "Again.") In many instances an aspectual marking of an action or event.

Negation. An act expressing rejection, denial, nonexistence, refusal, or other negative function. ("I won't!"; "No!"; "Don't!"; head shake; "It's not here.")

Affirmative. Addition proposed for the present study. An act expressing agreement or acceptance. ("Yes."; head nod.) Especially used with an affirmative response to a question.

Volitional object. An act focusing on (through gesture) or expressing (through word) only the object of a demand.

Agent. An act focusing on or expressing the actor (instigator of the action). (Pointing to Stevie if Stevie pushed David; saying "Stevie." in the same situation.) The agent will always be animate.

Action or state of an agent. An act focusing on (and/or expressing) the action of an agent. (Someone is eating and the child says "Eat."; Leslie is painting and Gina says "Paint."; Stevie is climbing down from a high place and says "Down.") It is the use of the gesture or word to communicate about what someone is doing (or becoming). This category was modified in the present study to include what the child wants to have happen to himself or others. ("I want to eat.")

Action or state of an object. A gesture or utterance focusing on or expressing what is happening to an object. (Stevie throws a spoon down on the floor and says "Down.") It is the use of the word or gesture to talk about what is happening (or has happened) to something (or the state it has reached due to someone's action). This category was modified in the present study to include what the child wants to have happen to an object. ("I want it open.")

The patterns of the mother's responses to the semantic functions expressed nonverbally by Subjects One and Two are shown in Tables 5 and 6 respectively. The four semantic categories used most frequently were the same for both subjects: volitional object, locate/name, action or state of agent, and action or state of object. The categories used most frequently by the subjects were very similar to those used most frequently by subjects in the Curtiss et al. (1979) study.

It can be seen from Tables 5 and 6 that both of the mothers highly treated as communicative (at least 75% of the time) the categories of object, action or state of an agent, and action or state of an object. Subject One's mother also treated the category of negation as communicative at a high rate, while Subject Two's mother also treated the locate/name and affirmative categories as communicative at a high rate. High ignore rates (>25%) were obtained for Subject One's mother for the performative, locate/name, and volitional object categories, and for Subject Two's mother for the performative and negation categories.

Table 5
 Pattern of Mother's Responses to the Semantic Functions Expressed
 by Subject One. Numbers in Columns Represent the Percentage of Times
 a Response Category was Used for Each Semantic Function.

Number of Times Expressed	I	T (T+R)	R	Treated as Communicative ^b
14 Performative	57.1	28.6	14.3	42.9
23 Locate/Name	43.5	21.7	34.8	56.5
8 Object	25.0	25.0	50.0	75.0
Dative				
Object associated with another object or location				
Animated Association				
Locative ^a				
Aspect (of an event) ^a				
Affirmative				
9 Negation	11.1	11.1	77.7	88.8
38 Volitional object	50.0	18.4	31.6	50.0
Agent				
28 Action or state of an agent	7.1	39.3	53.6	92.9
15 Action or state of an object	6.7	53.3	40.0	93.3

^aCategory was expressed by child at least once but less than four times and therefore percentage not calculated.

^bSum of second and third column.

High rates (>75%) of translating responses were made by Subject Two's mother to the semantic function of an object. Subject Two's mother did not use a high rate of translating responses for any of the semantic function categories.

DISCUSSION AND RECOMMENDATIONS

In summary, it appears that the majority of the nonverbal communication attempts of the two hearing-impaired children who served as subjects in this study was treated as communicative by the mothers, i.e., the mothers either responded (verbally and/or nonverbally) to the children's attempts and/or directly translated the nonverbal messages of their children into conventional linguistic symbols. However, a substantial number of communicative attempts were completely ignored by the mothers, particularly the mother of Subject One, who failed to acknowledge approximately one-third of her child's communicative attempts. For both mothers, there was a tendency for greater acknowledgement of nonverbal communicative attempts that were

Table 6
 Pattern of Mother's Responses to the Semantic Functions Expressed
 by Subject Two. Numbers in Columns Represent the Percentage of Times
 a Response Category was Used for Each Semantic Function.

Number of Times Expressed	I	T (T+R)	R	Treated as Communicative ^b
8 Performative	37.5	50.0	12.5	62.5
27 Locate/Name	18.5	55.6	25.9	81.5
12 Object	0	91.7	8.3	100.0
Dative ^a				
Object associated with another object or location ^a				
Animated association				
Locative ^a				
Aspect ^a				
12 Affirmative	25.0	50.0	25.0	75.0
6 Negation	50.0	33.3	16.7	50.0
28 Volitional object	25.0	32.1	42.8	74.9
Agent ^a				
33 Action or state of an agent	9.1	63.6	27.3	90.9
30 Action or state of an object	23.3	60.0	16.7	76.7

^aCategory was expressed by child at least once but less than four times and therefore percentage not calculated.

^bSum of second and third columns.

accompanied by vocalization or verbalization.

The pattern of responses as a function of pragmatic intent and semantic function was different for the two mothers. For example, Subject One's mother tended to ignore the demand and labeling categories at a high rate, whereas these same categories were treated as communicative a substantial portion of the time by Subject Two's mother.

Results of this investigation suggest that there is a need to train parents of young hearing-impaired children to identify their children's nonverbal communication attempts. Particular emphasis should be placed on teaching parents to respond to those attempts in a manner that will promote spoken English development in order to maximize the acquisition of communicative competence across form and use dimensions of language. Streng (1978) emphasized that teachers, as well as parents, must attempt to achieve communicative *interaction* with the hearing-impaired child:

If continued interaction is necessary to the establishment of meaningful dialogue between speaker and listener, it becomes imperative that not only

mother-child relations but that teachers for the hearing impaired become conscious of encouraging normalized interactions. If a dialogue attitude is not encouraged, then the communication network dominated by a teacher of the deaf who stops talking just long enough to draw breath will continue as the norm. One-way communication does not allow the child to express the knowledge about language he possesses, nor does it give the teacher opportunity to discover anything about the child's linguistic performance. (p. 51)

The traditional approach to teaching language to a young deaf child has focused on stimulating the child with a "core vocabulary" of words in everyday, contextual experiences. Selection of words for the core vocabulary has traditionally been based on the visibility and audibility of the words, as well as their appeal and relevance to young children. Words such as "puppy", "bye-bye", "mama", and "baby" are representative of the types of words frequently selected. The results of this study confirm the suggestion by Lowell and Lowell (1978) that close examination of the child's nonverbal communication prior to selection of core vocabulary items and linguistic target areas may facilitate language development in young deaf children.

In the present study, if the mother responded to (verbally and/or nonverbally) or directly translated the child's nonverbal communicative attempts into conventional linguistic symbols, then it was considered by the investigator that the mother had indeed treated the child's communicative attempt as communicative. While either of these major response categories (response and/or translate) would certainly appear to be more desirable than the "ignore" category, the author feels that use of the "translate" or "translate and respond" categories whenever possible would be most advantageous in interactions with young hearing-impaired children who, like the subjects in this study, are in the emerging language stage. Through use of the "translate" response, the mother could provide the child with the conventional linguistic symbols that represent what the child is attempting to communicate nonverbally. In the present study, Subject One's mother used the "translate" categories only slightly more than one-fourth of the time, while Subject Two's mother translated her child's nonverbal attempts more than half the time. It is suggested that the mothers (particularly Subject One's mother) would be better able to facilitate their child's language development if they were trained to make a larger proportion of translating responses. A similar proposal has been made by MacDonald (Note 2) regarding language intervention with developmentally-delayed language-disordered children. He states:

If we view a child as having two communicative languages, one non-linguistic and one linguistic, then the task of his natural and professional teachers is clear: to be his second language teacher and code into linguistic forms those non-linguistic behaviors that may be communicative messages. (p. 10)

Bronfenbrenner (1975), like MacDonald (Note 2), has stated that long-lasting gains in language development can be achieved when the parents of language-

disordered children are viewed as the primary individuals in the child's intervention program, and when the emphasis in language intervention is on encouraging mothers to interact verbally with their children during joint activities.

As stated by LaFrance and Mayo (1978, p. 143), "... becoming communicative involves attending to others, responding to them, and knowing how, in turn, one's own responses affect others." Although the author would encourage mothers to attend to and attempt to translate their child's nonverbal messages, it should be fully understood that this is not always an easy task. A review of the transcripts obtained in the present study reveals numerous occasions, particularly for the mother of Subject 2, in which the mother attempts to translate the child's idiosyncratic message. Two of these occasions are given as examples below:

Example 1:

[Subject One has been playing with a small pot and lid. He makes a slight waving motion over the pot, then looks at his mother]
 Mother: Tell it bye-bye? Wanna put it in here? [points to toy box]
 [Subject One waves hand over pot again]
 Mother: Is it hot? Is it hot? Hot?
 [Mother makes waving gesture over pot]
 [Subject One again waves hand over pot and looks at his mother]
 Mother: Hot. Too hot?

Example 2:

Subject Two: Mum Mum Mum [points across room]
 Mother: What? The baby? [Mother picks it up] You want the baby?
 Subject Two: Mum Mum Mum Mum Mum [continues pointing]
 Mother: The puzzle?
 Subject Two: Mum Mum Mum [points again]
 Mother: You want the bottle?
 [Mother shows it to him and pointing stops]

There will be times, also, when it may not be appropriate to translate the child's nonverbal communication. Several times Subject One protested his mother's attempts to replace his hearing aids, which he had removed. It is unlikely in such a situation as this that the mother, in her effort to replace the aids, would take the time to provide linguistic symbols for what he was communicating nonverbally.

Regarding the pragmatic intents and semantic functions of the children's nonverbal communication, there were striking differences between the two mothers studied in the pattern of responses to the most frequently used pragmatic intent and semantic function categories. The most frequently used pragmatic intents for both children were the categories of demand and labeling. High ignore rates (>25%) were obtained for Subject One's mother

in both categories, whereas Subject Two's mother highly treated both categories as communicative, directly translating over half of the nonverbal attempts in the labeling category. Likewise, three of Subject One's five most frequently used semantic function categories yielded high ignore rates from his mother (volitional object, locate/name, and performative) while Subject Two's mother highly treated as communicative all five of his five most frequently used semantic function categories, directly translating over half of four of these categories (action or state of agent, action or state of object, locate/name, and object).

It appears, therefore, that the mother of Subject One might benefit from intervention strategies aimed at: (a) helping her identify her child's communicative behaviors; (b) helping her identify the intent and meaning expressed by her child's nonverbal communication; and (c) helping her respond to her child's nonverbal communication in a manner that will encourage communicative interaction and facilitate her child's exposure to conventional linguistic symbols that match his idiosyncratic intent and meaning.

Finally, it can be noted from Table 1 that Subject One's mother used the "translating and respond" category slightly more often than Subject Two's mother. It is the author's opinion that this is probably to be expected in view of the differences in the two subjects' stages of spoken language development. At the time of this study, Subject Two was just beginning to use words meaningfully, whereas word approximation was not yet fully stabilized in Subject One. If the child was gesturing and vocalizing, the mother of Subject One was perhaps more likely to translate and then respond to the attempt than the mother of Subject Two because of their expectations regarding the children's language abilities. The mother of Subject Two frequently translated her child's attempts and then looked at him expectantly, hoping for an imitation, whereas the mother of Subject One, with a lower level of expectation, translated and then responded, in essence "playing the double part" suggested by van Uden (1979). It might be wise to encourage mothers whose children are in the early stages of language development to translate and then respond to the child's nonverbal communication attempts. When the child has demonstrated the ability to approximate words, the "translate" response might be more appropriate, with the mother delaying an actual response to the attempt until the child approximates or attempts to approximate the linguistic symbols she has modelled.

CONCLUSION

In conclusion, it is important that responses of mothers to the nonverbal communication attempts of their hearing-impaired children be considered in the designing of parent-infant intervention programs. Intervention strategies should be used by clinicians to facilitate communicative interaction between mothers and their hearing-impaired preschoolers. Emphasis should be

placed on delineating strategies for teaching parents to respond to their children's communicative attempts in such a way as to promote spoken language development and to facilitate acquisition of communicative competence by their children.

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