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**Maternal Interaction and Verbal Input in
Normal and Hearing Impaired Children**

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Abstract

Maternal interaction represents the modified language spoken by the mothers to their young children. The present study aimed at studying the maternal interaction and verbal input in normal hearing and hearing impaired children.

Ten normal hearing children with ten linguistically matched hearing impaired children and their mothers participated in the study.

The mother-child interaction was audio recorded during a play context. A ten-minute sample was transcribed for each mother-child interaction.

The results indicated that the communicative functions of the mothers of the two groups varied significantly within groups. However, on comparison, the two groups showed no statistically significant difference. The findings of this study indicated occurrence of different communicative functions implying on the nature of intervention necessary for the hearing-impaired children. Parents play a primary role in teaching language to their young hearing-impaired children. The process, which appears to be constantly evolving, is one in which a change in the communication habits of one partner (i.e. child) dramatically affects the communication habits of the other (i.e. mother). This pattern may be influenced and changed for the better, throughout language intervention.

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Maternal Interaction and Verbal Input in Normal and Hearing Impaired Children

Introduction

One of the greatest accomplishments of infancy and early childhood is the acquisition of conventional communication and linguistic competence. Early social interaction provides the vehicle through which the child acquires the linguistic structures, the semantic content and the social uses of languages. Thus, the nature of everyday interactions between the mother and the child is of vital interest and importance to those who wish to understand the nature of early language development. It has been well established that there are systematic differences between verbal output to children and among their mothers. When mothers speak to infants/young children, they tend to modify their style of verbal output which has been termed as 'motherese'. Mother's verbal output to children has been found to contain modifications in suprasegmental, phonological, syntactic, semantic and interactional features.

Maternal interaction (MI) is much simpler in its structure and contains short formed-utterances, fewer complex sentences, is highly redundant and consistent; is much more closely tied to the immediate context, and employs a number of special discourse features. This modification of mother's/other's verbal output is reported to aid the child's language learning process, although the exact relationship between maternal interaction and the child's acquisition of language is much less straight forward. Different aspects of MI have been investigated in normal children and hearing impaired children:

Phonological aspects of MI

- a) Cruttenden (1994) reported that recurrent consonantal substitutions, Consonantal clusters (e.g. drink → [dinki], Consonant harmony applied between consonants across an intervening vowel (e.g. dog → [dogi] and reduplication and a simple consonant vowel type of syllable structure predominates in the phonological aspects of the MI.

Semantic aspects of MI

Blount (1972) reported more limited vocabulary use and low type token ratios for vocabulary but with unique words for objects and many diminutives.

Syntactic aspects of MI

Newport (1975) and Cross (1977) have reported shorter mean length of utterance in adult- to-child verbal input. The verbal input of a mother to an eighteen month old has a shorter MLU, with more single names and phrases. Newport (1975) studied the verbal input of fifteen mothers to their children and found the incidence of ungrammatical errors to be only one in 1,500 utterances. The sentences uttered are transformationally less complex with fewer verbs per utterance, fewer coordinate or sub-ordinate clauses, and fewer embeddings. Newport (1975) reported that maternal interaction contains more content words and fewer function words with

rarity of modifiers and pronouns. He also reported that deletion of subject nouns or pronouns and auxiliary in yes-no questions. Cross (1977); Newport, Gleitman & Gleitman (1977) supported diversity in adjusting language input to children's presumed levels of understanding.

Discourse aspects of MI

At the discourse level, the mother's verbal input is very much shaped by the child's linguistic abilities, his cognitive abilities, his ideas and interests. Newport, Gleitman and Gleitman (1977) reported that 16% of the motherese utterances involve deixis, 6% of expansions and 23% of repetitions. Plausibly, deictic usage might help vocabulary, expansions help to build syntax and repetitions might influence both to the extent that it could allow rehearsal or comparison among forms. Brown, Cazden and Bellugi (1973) viewed that there are certain features of mother's language, which seem 'designed' to promote verbal interaction and they termed it as 'constituent prompting'. Newport, Gleitman and Gleitman (1977) concluded that adults use shorter sentences; they do not necessarily use less complicated ones. An abundance of semantic contingencies such as expansions and extensions were found in the language of mothers of linguistically advanced children (Cross, 1977).

MI in the Hearing-impaired Children

The study of language acquisition in deaf children is one in which the questions of input take on a unique importance.

Gregory et al. (1979) examined mother's verbal input to the same deaf and hearing children at 18 and 24 months in a spontaneous play situation and they used language to the hearing children was more complex, whereas the language addressed to the deaf children was less complex.. Also the deaf children's mothers used more imperatives and fewer declaratives and commented less often on the child's vocalization.

Cheskin (1981) made a quantitative and qualitative analysis of the verbal input directed by hearing mothers to their young deaf children and reported each of mothers spoke in short sentences that were usually grammatically complete. There was a high incidence of declarative sentences, repetitions and restrictive vocabulary. Verbal input to hearing-impaired infants was also reported to be less complex in terms of MLU and syntactic constructions (Cross, et al. 1980; Wedell-Monig and Westerman, 1977).

Differences were also found regarding mother's style of reference. Mothers of hearing-impaired children refer less to absent object and restrict their references more to immediate context (Wedell-Monig and Westerman, 1977).

Cross et al. (1980) found that children's receptive linguistic ability was the major determinant of the MI features. Henggeler, Watson and Cooper (1984) investigated 'verbal' and 'non-verbal' controls in hearing mother – deaf child and hearing dyads and found that deaf children's mother did exercise more control, reflecting appropriate attempt to provide structure for a child with

limited communicative ability. They also reported that interaction were quantitatively similar but qualitatively different. Deaf children's mothers used fewer indirect commands than the others; and the deaf children were less responsive to their mother's requests.

On the other hand, studies which have matched the hearing impaired to normally developing children on the basis of language age, and have observed that verbal input addressed to the impaired population was highly similar to those addressed to normal children with similar language abilities (Nienhuys, Cross & Horsborough, 1984).

Caissie and Cole (1993) investigated the role of maternal directiveness plays in discourse rather than linguistic achievements. Results showed that mother's directives were more frequently expressed during interaction with children exhibiting less advanced language abilities. They viewed that maternal directiveness may act as a facilitator of conversational turn-taking at least during the early stages of communication development by providing a strategy for framing the communicative events, thereby keeping the child involved in the conversational interaction.

A number of studies have reported hearing mothers of deaf children being less responsive than hearing mothers with normal children. Mothers were less likely to respond to their deaf children vocalization (Gregory, et al. 1979), likely to misinterpret them, (Cheskin, 1981), less likely to expand their children's utterance (Nienhuys, et al. 1984).

Review of the literature reveals that there is a lack of strong evidence for the facilitative/unfacilitative effects of the verbal input directed to the hearing-impaired children and research lag behind in this area. The studies on the maternal interaction in the hearing impaired children, however, have been limited and controversial. Hence the present study was attempted with the aim of studying the maternal interaction and the verbal input in normal hearing and hearing-impaired children and to determine if any significant difference existed.

Method

Subjects

Two groups of subjects participated in the study. The first group included ten normal hearing children (5 males, 5 females) in the age-range of 12-24 months and their mothers. The second group comprised of ten linguistically matched hearing-impaired children (7 males, 3 females) in the age-range of 3-5 years and their mothers. All the hearing-impaired children exhibited severe-profound sensori-neural hearing loss bilaterally of prelingual onset. The hearing-impaired children and the normal hearing children had similar language ages, ranging from 12-24 months. All the mothers of both the groups were native speakers of Kannada language in the age-range of 22-30 years.

Procedure

The mothers of two groups were instructed to “play with your child as you would at home”. The mother - child interaction was randomly selected from audio taped during a play context for about 20 minutes using a portable tape recorder and cassette. A ten minute sample was transcribed for each mother child interaction. The transcribed data was analyzed for the following communicative functions and the Mean length of Utterances. The following communicative functions are- a) invitation to vocalization, b) accompaniments, c) Self-repetitions and repair devices, d) Imitations, e) expansions, f) Continuates, g) Yes/No reply, h) Other reply, i) Informative, j) Closed questions, k) Open questions, l) Directives: imperative form, m) Directives: interrogative form, n) Child controlled events, o) Caregiver controlled events, p) People/objects present, q) Nonimmediate etc. and the Mean length of Utterance (MLU) in words was computed (Following Brown’s rule, 1973) for 100 utterances from the transcribed data for each mother child dyad.

Analyses

The data collected was analyzed by using appropriate statistical measures. The mean and standard deviation for the 17 communicative functions and MLU were calculated for both the groups. The independent ‘t’ test was used to study the significance of differences between the means of two groups.

Results and Discussions

Table 1 shows Mean, SD and t value of maternal communicative functions for Hearing impaired and normal children

S.No	Maternal Communicative Functions	Hearing Impaired		Normal		‘t’ value
		Mean	SD	Mean	SD	
1	Invitation to vocalize	7.44	1.28	5.29	1.84	2.94**
2	Accompaniments	3.08	1.76	5.40	3.80	1.69
3	Self-repetitions and repair devices	32.04	5.04	29.09	6.57	1.08
4	Imitation	1.64	1.01	5.71	3.05	3.87**
5	Expansion	1.41	1.18	9.27	3.49	6.49**
6	Continuates	3.08	1.73	5.40	2.02	2.66*
7	Yes/No reply	1.72	0.68	3.13	1.82	2.20*
8	Other reply	1.67	0.66	2.74	1.31	2.22*

9	Informatives	15.16	4.76	17.99	4.06	1.38
10	Closed questions	8.91	2.90	9.99	4.50	0.61
11	Open questions	14.12	5.28	15.12	6.41	0.36
12	Directives: imperative form	22.27	5.83	18.42	7.46	1.24
13	Directives: interrogative form	8.66	2.57	3.70	2.14	4.48**
14	Child controlled events	4.19	1.73	8.67	3.02	3.92**
15	Caregiver controlled events	2.30	1.40	5.09	2.03	3.44**
16	People or objects presents	7.58	2.99	8.90	2.33	1.06
17	Non-immediate	0.93	1.15	0.90	0.94	0.06

** indicates $p < 0.01$, * indicates $p < 0.05$

a) Maternal Interaction in Normal Hearing Children

As seen in the table1, The analysis of maternal communicative function in the MI of normal hearing children indicated that mothers of the normal hearing children used significantly greater percentage of self-repetitions and repair devices, directive imperatives, informatives, open-question and closed questions followed by expansions, referential features of peoples/objects present, child-controlled events in that order. Few studies supported these results (Brown, Cazden and Bellugi (1973); Blount (1972), and Newport, Gleitman and Gleitman (1977)). The communicative functions, which occurred with a lesser percentage, included imitation, continuates, accompaniments, speech act features of invitation to vocalize and referential features of caregiver controlled events, followed by directive interrogatives, yes/no reply and other reply and the non-immediate referential features.

b) MI in Hearing Impaired Children

From the table 1 it is clear that self-repetition and repair devices were found to occur with a greater percentage when compared to other communicative functions. Similar findings were reported by Wedell-Monnig and Westerman (1977) and Cheskin (1981) who found that maternal interaction of hearing - impaired children included more repetitions. The mother of hearing-impaired children used a significantly greater percentage of directive imperatives, while the directive interrogatives occurred less frequently. Some investigators have also reported a higher frequency of directives in maternal interaction of hearing impaired children (Caissie and Cole, 1993). Caissie and Cole (1993) reported that frequency of occurrence of directive behavior ranged from 8% to 46% with an average of 26%.

With regard to conversational effect of maternal directives, earlier studies claimed that excessive expression of directives provided an impoverished input to the child and were negatively associated with language acquisition (Newport et al. 1977). However, the recent studies suggest that the use of directives by mothers may play a positive discourse role by facilitating the child's participation in the conversational turn taking (Caissie and Cole, 1993). All the hearing-impaired children were more likely to take a turn in the conversation following a mother's directive behaviors than following a non-directive behavior.

(c) Comparison between the MI of Normal Hearing Children and the Hearing Impaired Children

Independent t test was used to compare both the groups. The results indicated that when the hearing impaired children were linguistically matched with the normal hearing children, no significant differences ($p > .05$) existed between the two groups in terms of the communicative functions of accompaniments, self repetitions and repair devices, informative, closed and open questions, directive: imperative forms, referential features of people/object present, and non-immediate referential features..

These results suggested that hearing impaired children received verbal input, which is, essentially similar to that received by the normal children with comparable language abilities. The mothers of hearing impaired children adjusted their conversational style to suit the language levels of their children. These findings also provide evidence to support by Cross (1977); and Wedell-Monnig and Westerman (1977).

Further, the results indicated that significant difference existed between the two groups in terms of the occurrence of the imitations, expansions, invitation to vocalize, continuates, directive: interrogatives, yes/no reply, other reply, child-controlled events, and caregiver controlled events. This clearly indicated that that the presence of hearing impairment in the child adversely affected certain features of maternal interaction. Some of these findings of the maternal communicative functions were also supported by a number of investigators (Gregory et al. 1979; Cheskin, 1981; and Nienhuys, et al. 1984). Henggeler et al. (1984) have reported that the interaction of mothers with their hearing-impaired children were quantitatively similar but qualitatively different from normal mothers.

MLU Analysis of Normal Hearing Children

Table 2 shows the mean and standard deviation (SD) values for MLU of normal hearing and hearing impaired children.

Hearing Impaired		Normal Children		't' value
Mean	SD	Mean	SD	
1.96	0.13	2.0	0.13	0.66

Results showed that the mother's Mean Length of Utterance (MLU) was found to be 2.0 words and the SD was 0.13. This indicated that the MLU in maternal interaction of normal hearing children was considerably shorter. The utterances were simple with more single names and phrases. This is in agreement with results obtained by Newport (1975); and Cross (1977) who have also reported of shorter MLU in the MI. The mothers of hearing-impaired children used shorter and simpler utterances with a mean MLU of 1.96 and standard deviation of 0.13. Several investigators have also reported that verbal output to hearing impaired children was less complex

in terms of MLU and syntactic construction (Cross et al. 1980; Weddell-Monnig and Westerman, 1977).

Independent t test was used to see the significant difference between normal hearing and hearing impaired children of MLU. Result showed that there was no significant difference between two groups ($p > .05$). These findings also provide evidence to support by Cross (1977); and Wedell-Monnig and Westerman (1977).

To conclude, the study revealed both quantitative as well as qualitative differences between the two groups and their mother-child dyadic interactions. The communicative functions of mothers of the two groups varied significantly within groups. However, no statistically significant differences were obtained. The study has implications for management and language facilitation in hearing-impaired children as including their parents significantly and continuously throughout intervention.

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