DOCUMENT RESUME

ED 397 616 EC 304 948

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TITLE	Characteristics of Pre-Linguistic Communication in Deaf Children.
PUB DATE	Apr 96
NOTE	14p.; Paper presented at the Annual Meeting of the American Educational Research Association (New York, NY, April 8-12, 1996).
PUB TYPE	Reports - Research/Technical (143) -- Speeches/Conference Papers (150)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	Body Language; Cognitive Development; *Communication Skills; *Deafness; *Developmental Stages; Foreign Countries; *Hearing Impairments; Hebrew; Infants; *Language Acquisition; Nonverbal Communication; Sign Language; Toddlers; Young Children
IDENTIFIERS	Israel

ABSTRACT

This study examined the prelinguistic communicative behaviors of 48 young Israeli children with hearing impairments (ages 8 months to 49 months). Most subjects were severely hearing impaired. Ninety percent were born to hearing parents. A parent questionnaire utilizing a direct observation methodology in six situational contexts was selected, translated into Hebrew, and modified to be in accord with Israeli culture and with early characteristics of the language of the deaf. The revised version included information on the use of signs as well as gestures and speech. The study found two groupings of related communicative behaviors: pointing, independent behaviors, and collaboration with an adult; and vocalizations and words. Results suggested that the theoretical model of early communicative development in hearing infants, which finds a qualitative difference between early noncommunicative behaviors and later intentional communicative behaviors, was not directly applicable to these hearing-impaired children. In contrast to findings with hearing children and deaf children of deaf parents, pointing and gestures were not closely related to more developed prelinguistic skills in these children. Findings suggest that pointing reflects the strong need of hearing-impaired children to establish communication prior to development of more advanced communication skills, and that gestures are associated with the overall cognitive representational abilities of the children. (Contains 14 references.) (DB)

CHARACTERISTICS OF PRE-LINGUISTIC COMMUNICATION IN DEAF CHILDREN

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Paper presented at the AERA Annual Meeting, New York, New York, April 1996.

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The scientific information about pre-linguistic communication in young deaf children has been relatively sparse. This can be accounted for by the late diagnosis of deafness, the small pools of pre-linguistic subjects at any given center for deaf education, the growing trend to encourage home training programs, and the lack of language tests or measures which focus on detailed analysis of early communicative development in clinical populations (see Dromi, Weisel & Treitel, in press).

Hearing impairment is characterized by a delay in language development, as well as by difficulties in the establishment of natural adult-child interaction patterns (Bochner & Albertini, 1988; Meadow, 1980; Quigley & Paul, 1987). Therefore, the close evaluation of early patterns of pre-linguistic communication in deaf children becomes an important goal.

The goal of the present investigation was to characterize the pre-linguistic communicative behaviors of a large group of hearing impaired children (HIC). In particular, we were interested in testing whether models that were constructed on the basis of data gathered from hearing children (HC) are applicable to our population.

Table 1 about here

48 HIC children (21 girls and 27 boys), and their families participated in the study. Their chronological age ranged from 8 to 49 months. Most of them were profoundly hearing impaired (more than 91 dB HL in the better ear) and were diagnosed before the

age of 18 months. 90% of our subjects were born to hearing parents. 70% of the families who participated in the study were from low and middle-low socio-economic status (SES). The rest of the families were divided equally between middle-high and high SES. This population constituted a unique sample, atypical of the samples reported in the literature on pre-linguistic children, mainly because of its wide age range and the high percentage of older children. Another cause for the sample's singularity is the unnatural conditions for language acquisition. Most of the subjects in our sample were born to hearing parents, who communicate with them orally or by means of gestures only, and 65% of them were trained in an educational center which utilizes oral communication method.

A parent questionnaire that was originally constructed in Italy in 1992 by Camaioni, Caselli, Volterra & Luchenti for the evaluation of pre-linguistic behaviors of hearing infants, was utilized as a means for data gathering. The Camaioni et al. instrument is unique, as it utilizes a direct observation methodology. This methodology is used in order to collect data from parents on the early communicative behaviors that their children manifest in six situational contexts (eating , going out, requesting a toy, looking for an absent person, reading a book, and playing "peekaboo"). A closed set of communicative and non-communicative behaviors of motor, gestural, vocal, and linguistic nature are specified as optional responses within each context. The questionnaire was translated into Hebrew and modified to accord with Israeli culture and with early characteristics of the language of the deaf (Dromi, Ben-Shahar-Treitel, Goralnik and Ringwald-Frimerman,

1992). The revised version included information on the use of signs as well as gestures and speech. Eight categories of analysis were used to code the data: **Crying, Independent Behavior, Collaboration with an Adult, Pointing, Gestures, Vocalizations, Words,** and **Signs**.

A level of 86% agreement was reached between the observation of a trained researcher and the observation of nine parents. This level of inter-judge agreement demonstrates that the instrument is reliable, and that parents can utilize it to report on their own child's pre-linguistic behaviors (Dromi, 1995).

In order to verify the instrument's structural validity we conducted Smallest Space Analysis on our group data as a whole. In this analysis the inter-correlation among the average scores for the whole group on all questionnaire items are represented in space. A pictorial representation of a correlational analysis show in three dimensions all responses gathered from all parents in all the six contexts (a total of 70).

Figure 1 about here

Two groupings of related categories are identified. The first grouping is that of **Pointing, Independent behaviors**, and **Collaboration with an Adult** (lower left hand-side of the display). The second grouping consists of the categories of **Vocalizations** and **Words** (upper-central level of the display). Note that the category of **Signs** is located in

the right lower hand-side of the display as a separate category. The categories of **Cry** and **Gestures** are dispersed throughout the figure, indicating that different items belonging to these categories are not strongly related to each other, and that these categories are less distinct than the others.

The results indicate that the theoretical model of early communicative development in hearing infants, according to which there is a qualitative difference between an early phase of non-communicative behaviors and a later phase of intentional communicative behaviors, is not directly applicable to the population of HIC.

Pearson's correlation revealed a significant high positive correlation among the early emerging categories of **Independent behavior, Collaboration with an Adult** and **Pointing**.

Table 2 about here

The strong relationship between pointing and the early non-communicative behaviors is counter to the evidence found in the literature on the development of pointing in HC. The emergence of pointing in HC is relatively late and is indicative of an enhanced level of pre-linguistic communication (Caselli, 1990 ; Caselli & Volterra, 1990). Pointing in HC and in deaf children of deaf parents usually shortly precedes the emergence of the first comprehensible words and signs (Bates, 1976 ; Masur, 1990 ; Folven & Bonvilian, 1991). In the present sample of orally trained HIC, pointing was not closely related to

more developed pre-linguistic means. This finding might be associated with the subjects' older age and their need to utilize pointing in the absence of words or signs.

The use of **Gestures** was also highly correlated with **Independent Behaviors** and **Collaboration with an Adult** as well as with **Crying** and **Vocalizations**. Counter to theoretical prediction derived from the literature on HC (Acredolo & Goodwyn, 1990) and on deaf children of deaf parents (Folven & Bonvilian, 1991), the use of gestures in our sample did not correlate with the use of words and the use of signs. Our findings indicate that the representational basis for the generation of gestures is different from that of conventional linguistic symbols. This finding supports an earlier claim that was made by Petitto (1992) on the exclusivity of the underlying representations of linguistic symbols.

The use of **Signs** and the use of **Words** did not correlate in our sample. We tend to explain this result by the uniqueness of our sample, which consisted of mainly orally trained children, who were not exposed to natural sign language in their home environment. It should be remembered that some children in our sample were trained in a simultaneous communication educational environment, and therefore, the finding that **Words** and **Signs** were not correlated might also be related to the early emergence of signs in this subgroup of children.

The results of the present investigation indicate that there are two groups of pre-linguistic behaviors in HIC. The early group is that of the non-communicative behaviors of

crying, independent behavior and collaboration with an adult. The other group is that of words and signs.

Table 3 about here

As we have shown, two important pre-linguistic behaviors--pointing and gestures, which are considered to be closely related to the more developed symbolic functions that emerge in HC towards the end of the pre-linguistic stage--were not significantly correlated with the group of more advanced behaviors in our sample of HIC.

From the present research we learn that pointing and gestures are two different pre-linguistic behaviors. While pointing seems to be associated with the group of early behaviors, gestures seems to show great distribution throughout the developmental scale. On the basis of these results we propose that: a) pointing reflects the strong need of HIC to establish communication prior to the development of more advanced communicative means, and b) the use of gestures is associated with the overall cognitive representational abilities of HIC. As our sample was quite heterogeneous with reference to chronological age, cognitive functioning and other factors that are related to language learning in HIC, it is clear why non-systematic picture has emerged for the use of gestures. We strongly recommend to further research the relationship between the utilization of gestures and the emergence of words and signs in HIC. Such research requires a detailed and highly differentiated approach to the definition of the different kinds of gestures.

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Figure 1: Results of the Smallest Space Analysis on all questionnaire items for the sample as a whole by the eight categories of analysis

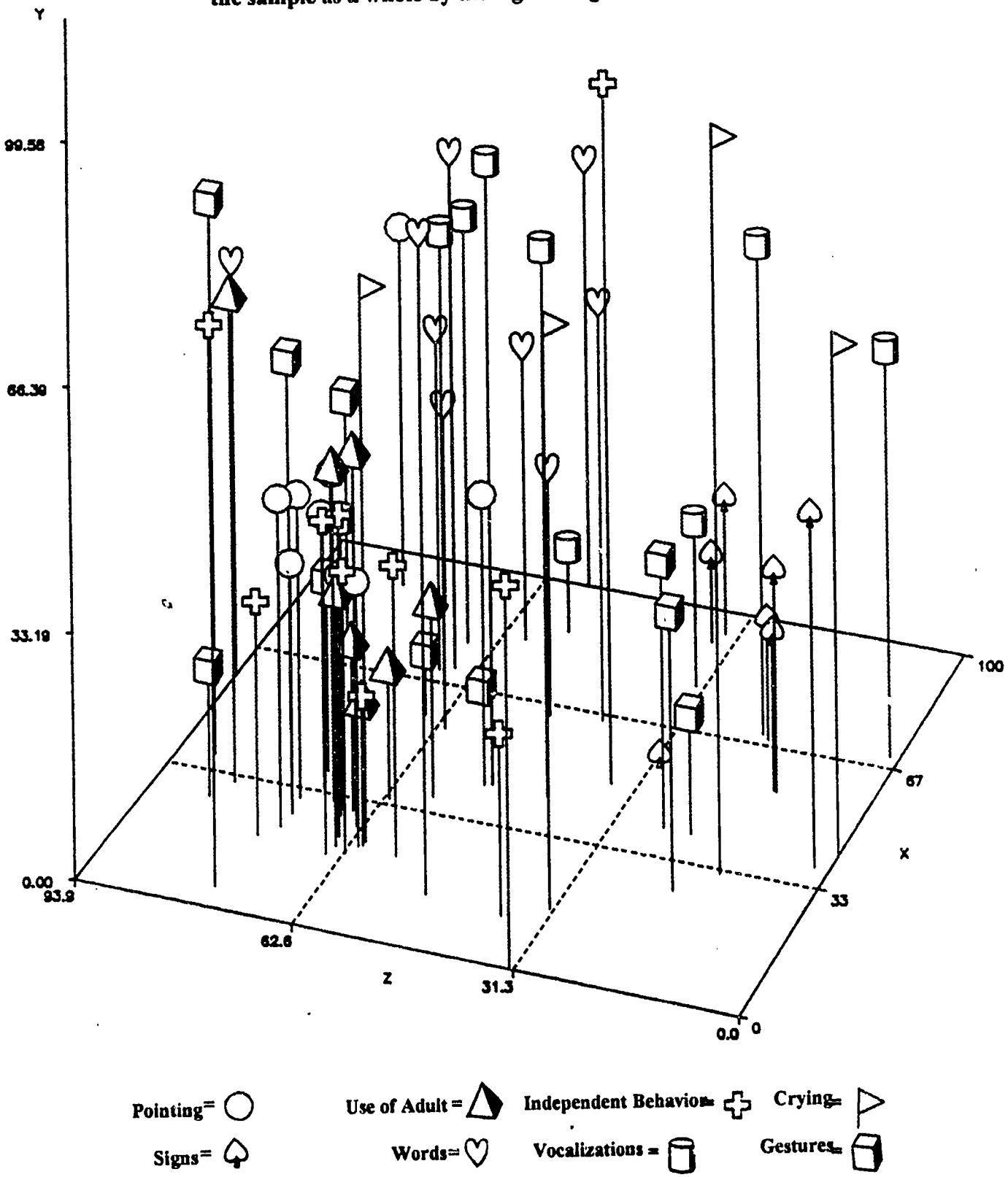

Table 1: DESCRIPTION OF SAMPLE

* 48 pre-linguistic deaf children:

Girls.....21
Boys.....27
Age.....8-49 months (mean 23 Ms)

* Degree of hearing loss:

Mild and moderate.....37.5%
Severe and profound.....62.5%

* Age at diagnosis:

Up to 12 months.....73%
13-18 months.....17%
19 + months.....10%

* Parents' hearing status:

Hearing.....90%
Hearing impaired.....6%
Combined.....4%

* SES:

Low and middle-low.....69%
Middle-high.....17%
High.....14%

* Method of Communication:

Oral.....65%
Simultaneous.....35%

Table 2: The Correlation Between the Eight Categories of Analysis

	C	I	A	P	G	V	W	S
C	---	.10	-.18	-.14	-.29*	.01	-.06	-.05
I		---	.65***	.64***	.25	.05	.13	.08
A			---	.70***	.50***	.16	.22	.11
P				---	.48***	.37**	.22	.02
G					---	.25*	.12	.10
V						---	.19	.19
W							---	-.13
S								---

* p< .05 ** p< .01 *** p< .001

C = Crying
I = Independent Behavior
A = Collaboration with an Adult
P = Pointing
G = Gestures
V = Vocalizations
W = Words
S = Signs

Table 3: Observed pre-linguistic behaviors in HIC

Crying	Gestures	
		Independent behavior
		Collaboration with an Adult
		Pointing
		Vocalizations
		Words - Signs