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## **A Parent Report Instrument for the Assessment of Pre-Linguistic Communication in Hearing Impaired Children**

### Introduction

The utilization of parent's questionnaires in the indirect assessment of early language development by very young typically developing children has become a common research practice (e.g., Bates, et al., 1994 ; Camaioni, Caselli, Longobardi, & Volterra, 1991). The use of parents as a primary source of information is especially constructive with very young subjects whose language behaviors are highly context bound, and are linked to the social and physical contexts of the home environment. The relative ease of administering parent's report instruments allow to collect data from large samples of children without the need for trained observers. From published reports we can learn that parents of young typical children provide reliable and valid information on the pre-linguistic and the early lexical development of their own children (e.g., Dale, Bates, Reznick, & Morisset, 1989).

The rationale for testing the utilization of a parent report instrument with clinical population was motivated by research as well as by clinical considerations. We hypothesized that the active involvement of the parents in describing their child's communicative abilities has the following advantages :

- It makes available to the clinician important information on the child's early communicative behaviors at the home.
- It enhances the parent's responsibility with regard to the child's early rehabilitation.
- It contributes to parent's awareness and understanding of new concepts and terms, and helps in establishing a "common" language between the clinician and the parent.

### The Goals of the present Study

The two main goals of the present study were to test the utilization of a parent questionnaire with a clinical population of hearing impaired children (HIC) who are older in age and manifest developmental delays and to assess and to characterize the communicative abilities of pre-linguistic HIC.

### Instrument

In 1992 Camaioni, Caselli, Volterra and Luchenti published in Italian, a highly structured parent report instrument that was constructed on the basis of detailed research findings on pre-linguistic developments during the first two years of life. This parent's questionnaire evaluates pre-linguistic communication in two types of natural contexts : the physical context in which the child is being cared for in terms of basic needs (e.g., food, diaper, changing, sleep), and the social-routine play context in which the parent-child

interaction has no instrumental value (e.g., the peekaboo game, and picture book telling). The Camaioni et al., instrument is unique since it requires a direct observation in data collection.

A set of six different physical and play contexts are presented to the parents as a set of questions, and they are asked to observe their child in each context several times and then to report about the behaviors noted in that context. For each of the six contexts, a close set of motor, gestural, vocal and linguistic behaviors are specified as optional responses. Parents are asked to indicate how frequently each behavior that is specified on the list is produced by the child in a three-point scale of never, sometimes, and often.

The instrument also contains two closed lists of 15 first words and 15 referential gestures which tend to emerge closely to the beginning of comprehensible speech (Dromi, 1993). The parent is asked to mark which words and gestures the child produces, to indicate how frequently the word or gesture is produced, and to specify the situations in which they are observed.

In the adaptation of the parent questionnaire for our population (Dromi, 1992), we translated it into Hebrew, and added to the list of optional responses under each question several items on the use of conventional signs. We adopted the lists of first words and first gestures according to the research on the early development of Hebrew (Dromi, 1987), we created a third list of 19 early emerging signs from Israeli Sign language.

The six questions (Contexts) in the Questionnaire :

1. what does the child do when he/she is hungry?
2. what does the child do when he/she wants to go out?
3. how does the child behave when he/she wants a toy?
4. when the preferred person is absent, what does the child do to call him/her?
5. when you look at/read a book together, what does the child do?
6. when you play "peekaboo" together, what does the child do?

The items that appear as optional responses for the question : "when a preferred person is absent, what does the child do to call him/her?"

- looks for the person where he usually is/where the child expects to find him or her
- Cries
- Takes an adult who is present to the place where the absent person might be
- Points to the place where the absent person usually is
- Indicates by gesture or facial expression that he is looking for somebody
- Vocalizes to call a person
- Uses a word to call the person
- Uses a sign to call the person

The subjects

48 parents of pre-linguistic HIC participated in the study.

There were 27 boys and 21 girls in the sample.

Most subjects (89,6%) were born to hearing parents.

Subject's ages are range between 8 and 49 months (mean age 23 months).

The degree of hearing loss ranged from mild and moderate (6,25% mild, 31,25% moderate) to severe and profound hearing losses of 91 DB or more (62% of the sample).

Most subjects were diagnosed even before they were 18 months old (91,5%).

Mean age for the beginning of language intervention was 13,4 months (SD-8,9 months).

Seventy percent of the families who participated in the study were from low and middle-low SES. The rest of the families were divided equally between the middle high (14,6%) and the high (16,7%) SES.

#### The procedure

A written introduction which explained the rationale for including the questionnaire within the complete pre-linguistic assessment, a summary of its goals, and an explanation of the terms : vocalizations, gestures, signs, and words, was given to the parents by the language clinician. The written document was then discussed in a very simple manner supported by concrete examples. Parents were instructed to fill in the questionnaire only after they have gained familiarity with the tool, and by selecting one question at a time. It was emphasized that several observations of their child's behaviors in each context must be conducted prior to the actual reporting. Parents were asked to return the questionnaires within two weeks.

#### Inter-Judge Reliability

An experienced language researcher, visited the homes of 9 families who represented the entire sample with regard to age, degree of hearing loss, and SES. She conducted direct observations on the child in two out of the six contexts that appear in the questionnaire. The Inter-judge agreement on the same two contexts for all subjects ranged from 74,4% to 91,6% with an average of 86,3%.

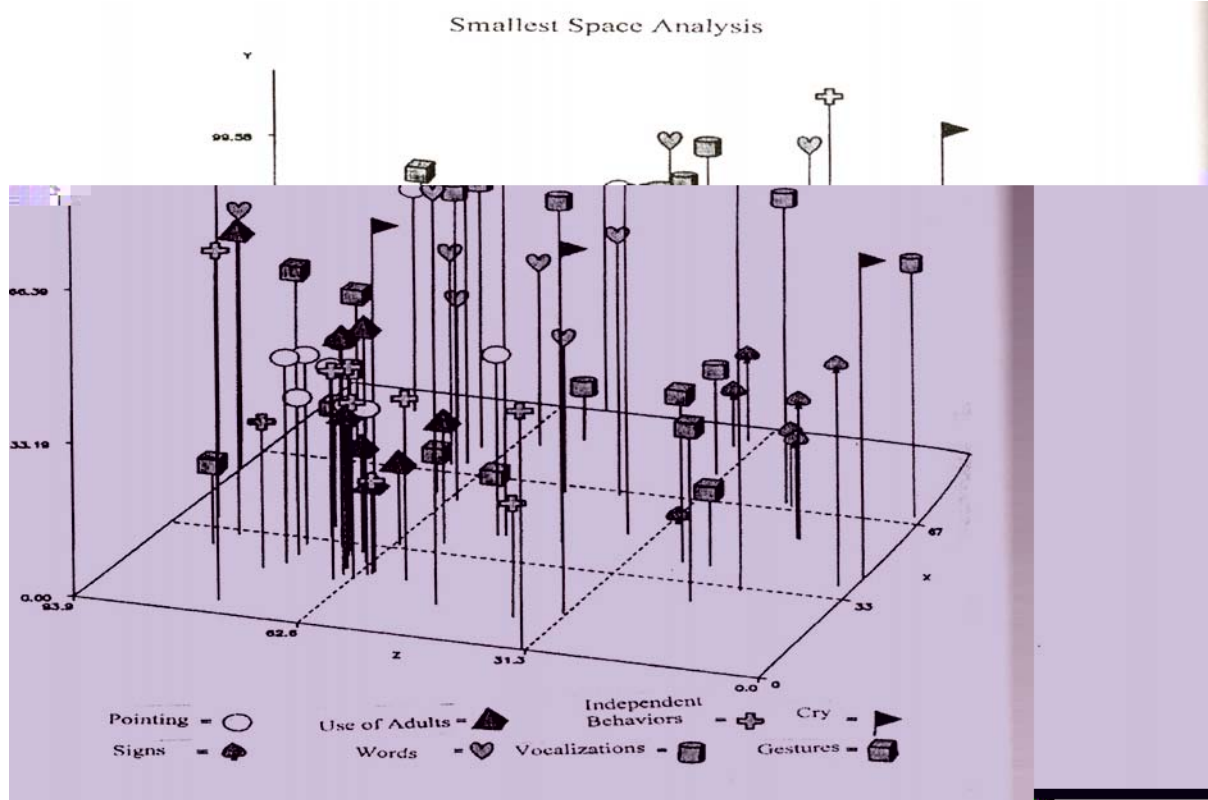
#### Results

The questionnaire data were coded according to the following eight categories : Crying (C), Independent Behaviors (I), Use of Adults (A), Pointing (P), Gesture (G), Vocalizations (V), Words (W), Signs (S).

A Smallest Space Analysis (SSA) was performed on all questionnaire items across all group results.

The SSA examined whether the a-priory categorization system fitted our data. Pearson Correlations were calculated among all the categories used for analysis to test the relationship among them. In this statistical analysis a relatively high positive correlation between the average score of two or more items is signified by spatial proximity, while a relatively high negative correlation between two items or more is represented by a greater distance.

*Table 1 : The Correlations among the Eight Categories of Analysis*



- Some categories were more homogeneous than others.
- Two groups of related categories are identified.
- Significant high positive correlations are found among the early emerging categories of Independent Behaviors, Use of Adults, and Pointing.
- No significant correlations were found between Pointing or Gesture and Word or Signs.

Pointing was the most homogeneous category. The categories of Independent Behaviors and Use of Adults were also homogeneous. The items belonging to the categories of Words and Signs were somewhat more sparse. Items belonging to the categories of Cry, Vocalizations, and Gesture are dispersed throughout the figure, indicating that the different items belonging to these categories were not strongly related to each other, and that these categories were less distinct than others.

The first group of related categories is that of Pointing, Independent Behaviors, and Use of Adults (see the lower left hand-side of the display). The second group of related categories consists of the categories of Words and Vocalizations (see the upper-central level of the display). Note that the category Sign is located in the right lower hand-side of the display as a separate category.

While Pointing is used by hearing infants relatively late in the pre-linguistic stage, and closely to the emergence of the first words, in our sample of HIC, pointing was positively correlated with the relatively simplistic communicative behaviors of performing an action in collaboration with adults, the amount of vocalizing, and with the production of gestures. The finding that early emerging, non-symbolic behaviors are closely linked to the behavior of Pointing is important as it indicates that in the case of HIC pointing is not predictive of true symbolic behaviors of signs and words.

The finding that Gestures were positively correlated with the Use of Adults, Pointing, and Vocalizations, and were not correlated with the production of words and signs, further

supports the claim that representational basis for the generation of gestures might be different than the representational basis for the generation of conventional symbols which are used linguistically (Petitto, 1992).

Pearson correlations between the scores in each of the three closed lists of words, signs, and referential gestures, and the eight categories of analysis further explored the relationships between the production of words, signs, and referential gestures with other pre-linguistic behaviors in HIC.

*Table 2 : The Correlations between the List's Scores and the Eight Categories*

List of	S	W	V	G	P	A	I	C
Gestures	20	17	-.09	.39**	.57***	.57***	.45**	-.22
Words	-.13	.67***	.20	.28*	.33**	.30*	.22	-.21
Signs	.49***	-.16	-.15	-.02	.17	.08	.02	-.10
*p<.05	**p<.01	***p<.001						

*Table 3 : the correlation between the Eight Categories*

	C	I	A	P	G	V	W	S
C	-	.10	-.18	.10	-.14	-.29*	-.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

Categories of analysis :

Crying (C) ; Independent behavior (I) ; Collaboration with an adult (A) ; Pointing (P) ; Gestures (G) ; Vocalization (V) ; Words (W) ; Signs (S)

- The scores in the list of gestures were positively correlated with four different categories of pre-linguistic behaviors. Namely, Use of Adults, Pointing, Gesture, and Independent Behaviors.
- The scores in the list of signs were positively correlated only with the score in the category of Signs.
- The scores in the list of words were positively correlated with the score in the category of Words. A positive and significant correlation was also found between the score in the list of words and the scores in the categories Pointing, Use of Adults, and Gesture. These correlations, however, were somewhat lower.

The high and positive correlations between the scores in the close list of words, signs, and gestures, and in the scores of the same categories in the more structured sections of the questionnaire indicate that the internal validity of the questionnaire is high. These results show that the tasks of :

- 1) conducting direct observations in specific contexts and
  - 2) selecting responses from a closed list optional responses
- are effective.

## Conclusions :

- I. The Camaioni et al., parent report instrument is a useful clinical tool for the assessment of pre-linguistic behaviors in HIC.
- II. Parents of HIC provide a reliable report on their children's pre-linguistic communication abilities by means of direct observation in the home environment.
- III. The set of eight categories for analysis that we have utilized in our research appear to be appropriate for evaluating the communicative abilities of HIC.
- IV. Pointing was clustered together with the early emerging behaviors in the pre-linguistic stage. The relatively older age of our HIC, as well as the delay in learning language, might explain why pointing was associated with early and non-symbolic behaviors.
- V. The production of gestures was not related to the production of signs and words. This category was idiosyncratic and was not as distinct as the other categories. Our results indicate that the use of gestures in HIC increases as independent behaviors, use of adults, pointing and vocalizations increase.
- VI. The representational basis for the generation of gestures seem to be different than the representational basis for the generation of conventional symbols that are used linguistically.

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- The criterion by which subjects were selected was the spontaneous production of less than 10 comprehensible words or the use of 10 consistent conventional signs. See Treitel (1995) for a more detailed description of the sample and the procedures.
- SES was computed on the basis of parent's education and occupation (Hartman, 1975).
- The complete pre-linguistic assessment consisted of a
  - 1) a detailed evaluation of non-verbal behaviors conducted by the clinician;
  - 2) an analysis of video-recorded dyadic interaction between the mother and her child, and
  - 3) the parent report instrument.