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NON VERBAL LANGUAGE IN MOTHERS WITH MALNOURISHED INFANTS

A PILOT STUDY*

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Abstract—Maternal non verbal language (NVL) includes all gestural manifestations of the mother towards her infant which bear an emotional connotation. This study compares NVL expressiveness of mothers with malnourished and with healthy infants in a population of low socioeconomic level. Forty mother/infant dyads: 20 mothers with malnourished infants and 20 with healthy infants were studied. Mothers with malnourished infants had low degree of NVL expressiveness (90%) and low personal satisfaction with their family life (70%).

INTRODUCTION

A number of biologic, socioeconomic and psychologic factors are known to influence the genesis of infantile malnutrition [1–10]. Although maternal cultural deficiencies have been recognized as important intervening factors, thus so far they have not been adequately investigated.

In the wide spectrum of factors encompassing the word culture, language appears as one of the relevant variables since it includes the whole set of symbols humans utilize to communicate. Language, either verbal or nonverbal, is one of the main sources of stimulation for infants and constitutes the basis of parent–child communication [11–14]. Maternal non verbal language (NVL) includes all the gestural manifestations directed to the child which bear an emotional connotation (caresses, slaps, gestural expressions of anger, kisses, etc.). It has been suggested that mothers acquire much of this behavior at least partially from the social group to which they belong [15–19].

In this study the NVL expressiveness of mothers with malnourished infants is compared to that of mothers with healthy offspring in a sample of low socioeconomic level. Results show that there are significant differences in NVL between both groups.

PATIENTS AND METHODS

For the purpose of this research, the following definitions were used:

Healthy infants were considered those whose weight was above the 25th percentile in the NCHS tables [20], who had not been hospitalized more than once in the preceding 3 months and for no longer than 10 days thus ruling out affective deprivation due to hospitalization.

By comparison, *malnourished infants* were those whose weight was below the 10th percentile in the same tables. It was also required for these patients not to have been hospitalized more than once in the last 3 months and for no longer than 10 days.

Low socioeconomic level corresponds to stratum 5 of Graffar's modified scale [21].The population sample was studied with a modification of this scale that has been repeatedly tested by the Institute of Nutrition and Food Technology of the University of Chile (INTA) and has been adopted for this type of work. Stratum 5, is identified by some characteristics of the head of the household such as low educational level—his job not requiring special skills—and by unfavorable housing conditions defined by lack of adequate sanitary facilities and of certain household goods such as T.V., kitchen range with oven, refrigerator or sewing machine.

To evaluate personal satisfaction with family life maternal reactions towards her socioeconomic problems, her perception of closeness and communication with her partner, and of their partner's affection towards her were assessed.

The population was drawn from Health Centres of the National Health Service in Santiago which provide medical services to populations of low socioeconomic level.

The sample consisted of 40 mother/infant dyads. Twenty dyads with malnourished infants formed the experimental group while 20 dyads with healthy infants served as control [22, 23]. Both groups of infants were constituted by 10 males and 10 females. It was required that all families in the sample have from 2 to 6 children, that the mother should not hold a steady job and that grandmothers or other female relatives should not live in the house. All infants were from 5 to 11 months of age, born by normal delivery after a full term (38–40 weeks) pregnancy and birth weight exceeded 2500 g in all cases. There were no signs of asphixia at birth and the Apgar score in controls and malnourished infants was 8.9 (range 8–10) and 9.0 (range 9–10) respectively (Table 1).

Mothers were first contacted at the Health Center. They were informed about the need to observe the infant while he was being fed and that they were going to be questioned about past and present family experiences.

The mothers acquiesced readily to receive the investigators at their homes. Three home visits were

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Table 1. Sample

	At birth		Actual	
% Adequation Weight/age (NCHS)	Malnourished (N)	Healthy (N)	Malnourished (N)	Healthy control (N)
70 > 80	—	1	13	—
80 > 90	4	1	7	—
90 > 100	6	3	—	10
100 > 100	7	8	—	5
110 > 120	2	4	—	5
Total	19	17	20	20
Apgar (1')				
$\bar{x}$	9.0	8.9		
SD	1.26	0.46		
Range	9–10	8–10		
t	0.9813	$P > 0.20$ NS		

carried out by one of the authors, who had made the first approach and did not know the group status of the infant.

The first visit was carried out by one of the authors and used to evaluate the socioeconomic level and to establish and confirm similarities between both samples through a survey. This aimed at making these groups as homogeneous as possible. During the second visit, a tape-recorded interview was conducted. It included maternal past history especially with reference to family structure, peer groups, affection received from members of her family and jobs held. The current situation (educational level, length of the present infant's breast feeding, personal satisfaction with her family life) was also explored.

During the third visit a structured observation of the mother was carried out while she performed two activities important for child rearing: feeding the infant and talking about him.

In preparation for this structured observation, a list of gestures expressing a wide range of positive or negative affective connotations had been developed. These gestures were classified as facial (ocular or labial) and corporal. Of the latter, only those made with the hands were taken into consideration.

Two of the authors pretested this list in 10 mother/infant dyads of socioeconomic level comparable to that of the dyads finally included in this study. Once it was ascertained that the list was comprehensive, the observation were always made by one of the authors and another trained, 'neutral' observer. During the actual observation two investigators sat in the same room looking at the mother/child dyad from different angles without making any comments. Although the mothers knew that some type of observation was being carried out, they did not know what was actually being studied. As soon as the observers left the home, they compared their notes. Only those gestures on which both observers concurred were considered for the scoring of maternal performance. Agreement about gestures between the two observers who collected all the information in the field ranged from 90 to 96% for every observation. But only the ones of perfect agreement were used.

The act of feeding was evaluated continuously for 10 min from the moment the mother took the infant in her arms. Her talk about the infant was evaluated continuously for 5 min starting with a clue question posed by one of the observers.

Although it is difficult to avoid the influence of the appearance of a malnourished infant on the evaluation by the observers, some points in this respect deserve further explanation:

(a) None of the authors is a physician; and therefore less acutely aware of nutritional status; (b) attention was directed more to the mother than to the child; (c) in cases of prolonged marasmic malnutrition, with arrest of growth, it is easy to assign infants a younger age than their true chronologic age rather than see them as malnourished. Since interrate liabilities were checked throughout the study, in fact were used as criteria for inclusion of data, adequate protection against observes bias is assured.

The Weschler Adult Intelligence Scale (WAIS) was used to measure maternal I.Q. It was performed at the Health center by one of the authors who did not know the group status of the mother. This test is standardized for the population of Metropolitan Santiago and it was used to provide a parameter for comparison of I.Q. between both groups.

Data were analyzed by the following system of scoring:

(A) *Recorded semi-structured interview:* The analysis of maternal current situation was made by means of an index of personal satisfaction with regards to family life. One point was assigned to positive perception of affection one to positive perception of communication with the partner and one for expressing absence of negative feelings with respect to her socioeconomic problems. This index allowed the building of a 'scale of satisfaction' with 4 levels. This scale had a maximum score of 3, with the following points: complete dissatisfaction = 0, little satisfaction = 1, moderately satisfied = 2 and completely satisfied = 3.

(B) *Structured observation:* The gestures of the mother while feeding or talking about her infant were

Table 2. Non verbal language general index

	Groups					
	Malnourished		Healthy		Total	
	(*N*)	(%)	(*N*)	(%)	(*N*)	(%)
Middle and high	2	10	11	55	13	32.5
Low	18	90	9	45	27	67.5
Total	20	100	20	100	40	100.0

$\chi_0^2 = 9.230$; $P < 0.01$, 1 d.f.

counted, analyzed, and grouped as previously stated (buccal, hand or eye gestures). Each gesture carrying a positive affective connotation was assigned a score of 1. The sum of the numbers of times each gesture was made in both performances gave the NVL general index, with maximum and minimum observed scores of 48 and 6 respectively. This index was arbitrarily graded as follows: low NVL = 1–16, middle NVL 17–32 and high NVL = 33–48.

The feeding performance was analyzed similarly but separately. One point was assigned to each positive gesture, and a maximum of 36 points was obtained. Thus, a NVL sub-index for feeding act was constructed arbitrarily: low levels of performance with scores of 1–12, middle levels 13–24; and high 25–36.

RESULTS

NVL was found to be significantly different as to its expressiveness between mothers with malnourished infants and those with healthy infants. Table 2 shows that 90% of mothers with malnourished group have a low level of NVL compared to 45% for the healthy group.

Table 3. Non verbal language sub-index: feeding act

	Groups					
	Malnourished		Healthy		Total	
	(*N*)	(%)	(*N*)	(%)	(*N*)	(%)
Middle and high	—	—	11	55	11	27.5
Low	20	100	9	45	29	72.5
Total	20	100	20	100	40	100.0

$\chi_0^2 = 15.7$; $P < 0.001$ 1 d.f.

Table 4. Variables of the mothers current situation* and past maternal jobs

	Groups				
	Malnourished		Healthy		Range both groups
	Median	Mean	Median	Mean	
No. of individuals in family group	4.7	5	5.8	5.2	3–8
Number of children	1.9	2.5	2.5	2.8	2–5
Maternal age	25–30	—	25–30	—	18–40
Maternal education (years)	4.6	—	4.6	—	2–9
Duration of feeding (months)	4.5	4.75	5.5	5.95	1–11
Marital status	The mode is 'married' in both groups.				

	Past maternal jobs				Total	
	(*N*)	(%)	(*N*)	(%)	(*N*)	(%)
Housemaid	2	28.6	12	92.3	14	70
Factory worker	5	71.4	1	7.7	6	30
Total	7	100.0	13	100.0	20	100

$F = 0.00718$; $P < 0.01$.
*There are no significant differences between the groups.

Table 5. Maternal personal satisfaction index

	Groups					
	Malnourished		Healthy		Total	
	(N)	(%)	(N)	(%)	(N)	(%)
Middle and high	6	30	15	80	21	52.5
Low and none	14	70	5	20	19	47.5
Total	20	100	20	100	40	100.0

$\chi_0^2 = 8.120$; $P < 0.01$, 1 d.f.

Table 3 shows the NVL sub-index for the feeding act. Mothers of malnourished infants exhibited low expressiveness; their maximum score was 12 gestures with positive affective connotation throughout the observation and the mean score of the group was 1. This contrasts with the feeding that only 55% of mothers with healthy infants had similar low scores.

Table 4 summarizes maternal current situation and past maternal jobs. The mean, median and range did not present significant differences between the two groups with respect to number of individuals in family group, number of children, maternal age, education, duration of breast feeding and marital stability.

The only variable in the 'past history' which revealed significant differences between both groups referred to the jobs held by mothers before their infant was born; 65% of mothers with healthy infant group had held jobs, compared to only 35% in the other group. Of those mothers who had worked, 92% among the Healthy group and 28.6% in the malnourished group had been employed as housemaids. By comparison 71.4% of the experimental and 7.7% of the control group had worked in factories ($P < 0.01$). Housemaid jobs are considered socially lower status jobs than factory worker jobs.

Maternal I.Q. measured with the WAIS test appeared below normal in both groups (with 95% of the experimental group and 90% of the control group scoring below 90; $\chi_0^2 = 0.009$, $P < 0.50$, NS).

Table 5 shows another variable of the 'maternal current' personal satisfaction with family life: 70% of mothers with malnourished group verbalized 'little' or 'no personal satisfaction' whereas, among the healthy group, 85% considered themselves as 'moderately or completely' satisfied.

DISCUSSION

Our results indicate that there are some differences in NVL expressiveness when mothers with malnourished infants are compared with mothers who have well-nourished offspring. These differences cannot be ascribed to lower maternal I.Q. in the former since both groups scored comparably low in the WAIS test, nor to the past history of the families since both groups had comparable backgrounds.

However the two groups differed in affective status of the mother. Mothers with malnourished infants had higher degrees of dissatisfaction or poor satisfaction with their family life (in 70% of cases). It may well be that mothers who feel lack of understanding, affection and communication on the part of their partner, and who furthermore perceive their economic problems as pressing and insoluble, are more prone to be unable to establish and adequate emotional relationship with their offspring. In the control group 85% of the mothers appeared as partially or totally satisfied with their marital life and showed significantly higher positive NVL, communication towards their infants.

A second difference possibly accounts for the NVL expressiveness to the infants may be the differences in acculturation between the two groups studied. Mothers with healthy infants may have acquired more adequate patterns of behavior while working as housemaids for families which belong to strata with better socioeconomic and cultural conditions. This possibly enabled them to learn patterns that resulted in better care for their infants when they went to live in an unfavorable milieu. It is also possible that the control group were already more energetic and had a better self image when they chose their job situation.

A further hypothesis implicates the infant, although this hypothesis was not directly tested in the current study. It may well be that a malnourished infant cries monotonously, is less attractive and thus provides less eliciting and positive feedback to the mother. She learns not to expect an active response to her care and caresses. This possibly leads to a decrease of the stimulation provided by the mother because she does not receive adequate responses. As a consequence, the expectations of both members of the dyad decrease to a low level of demand.

The precedent discussion suggests that the recovery of malnourished infants not only requires measures aimed at his physical and physical and psychological recovery, but also the rehabilitation of his family. Malnourished infants may be rehabilitated either in special centers or in hospitals but, if returned to an unfavorable family environment, the probabilities of relapse are high. On the other hand, unpublished studies carried out in one of the Close Nutritional Centers of the Chilean Nutrition Foundation indicate that when infants are fed adequate diets and are stimulated in carefully structured programs while efforts are made to rehabilitate their families, the percentage of relapse is low and few infants require a second period of institutional treatment*. Rehabilitation of the family emphasizes maternal training on adequate methods of infant care and stimulation and enhancement of maternal self image.

*Alvear J. & Vial M. Long-term follow-up of rehabilitated malnourished infants—Unpublished data. Instituto de Nutrición y Tecnología de los Alimentos.

Interventive efforts may well need to be directed at fostering the mother's self image first of all, while obviously also providing educational input as regards the specifics of childrearing. A depressed, emotionally depleted mother will not be able to utilize educational input.

This study points out the complexities of the interactive effects of maternal satisfaction, child well-being and maternal caregiving behavior. Interventions will have to be broad and yet specific enough to address and ameliorate the dynamics underlying the detrimental patterns and have to go well beyond content teaching.

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