Case Report

Relato de Caso

Functional aspects of communication: a longitudinal study of the first three years of life

Aspectos funcionais da comunicação: estudo longitudinal dos primeiros três anos de vida

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Keywords

Language development
Communication
Infant
Child, preschool
Mother-child relations

ABSTRACT

The aim of this multiple case-study is to present issues to the analysis and discussion of communicative development since the pre-verbal period. The case presentation starts with the description of the analyzed sample followed by the synthesis of data regarding the pragmatic aspects of six subjects, from the 1st to the 36th month of life. Data regarding the number of communicative acts expressed per minute, occupation of the communicative space, proportion of use of the communicative means and the communication's interaction proportion are included. The individualized analysis of the number of communicative acts produced per minute in each sample shows an increasing tendency that is almost constant, but also frequent individual variations. The occupation of the communicative space has shown larger and more constant variations that, nevertheless, continue to evidence evolution. The longitudinal follow-up allowed the observation of the proportion of the use of the verbal communicative mean and its essential role in the child's communication from the 21st month on. Since the 30th month the verbal mean is the more frequent but the gestural mean is still responsible for an important part of the communication initiated by the child. In what refer to the communication's interactivity, data show that the infant seek the interactivity since birth and that with age improve the quality and quantity of his/her communication's abilities.

Descritores

Desenvolvimento de linguagem
Comunicação
Lactente
Pré-escolar
Relações mãe-filho

RESUMO

O objetivo deste estudo de casos múltiplos é apresentar elementos para a discussão e a análise do desenvolvimento da comunicação desde o período pré-verbal. A apresentação dos casos inicia-se com a descrição do *corpus* de análise, seguida pela síntese dos dados referentes aos aspectos pragmáticos da comunicação de seis sujeitos, entre o primeiro e o 36º mês de vida. Foram incluídos os dados referentes ao número de atos comunicativos expressos por minuto, a ocupação do espaço comunicativo, a proporção de utilização dos meios comunicativos e a proporção de interatividade da comunicação. A análise individualizada do número de atos comunicativos produzidos em cada uma das amostras evidencia uma tendência crescente quase constante. No entanto, variações individuais também ocorreram. A ocupação do espaço comunicativo mostrou variações maiores e mais constantes que, não obstante, continuam a evidenciar evolução. O acompanhamento longitudinal possibilita a observação da proporção do uso do meio verbal e seu papel fundamental na comunicação de crianças a partir dos 21 meses. A partir dos 30 meses, esse meio é mais usado que o meio gestual, embora os gestos continuem a ser responsáveis por uma parte importante da comunicação iniciada pela criança. No que diz respeito à interatividade de comunicação, os dados evidenciam que os bebês buscam interação desde o nascimento e que, com o avanço da idade, ampliam suas habilidades comunicativas em qualidade e quantidade.

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INTRODUCTION

A large number of children with no verbal communication or very restrict vocal communication are referred to the clinical speech and language services. Therefore, it is essential that the speech and language pathologist understand the communication process in the absence of verbal expressions.

Recent studies[1,2] conducted with babies analyzed the gaze and the ability to maintain visual contact with another person. They concluded that the visual contact may be identified since the neonatal period and develop during the first month of life. The frequency of babies' visual contact with the mother increases during the first months and the ability to maintain eye contact since birth is used to select and process, between the various stimuli to which the child is exposed, those associated to socialization.

The authors point out that some of the babies' behaviors such as gaze, facial expressions, vocalization, social monitoring, communicative acts and interaction awareness can be transcribed as codes. Those codes are deciphered mostly by the mother or by the person with the mother's role[1].

Other studies[3,4] have shown that the babies with 10 to 11 months that were able to follow the adult's gaze direction and to vocalize spontaneously in a proto-declarative attitude presented earlier vocabulary understanding and gestural production than those that presented just vocalizations. It reinforces the role of the ability to follow the other's gaze to the language acquisition process.

In a study[5] about the evolution of pre-linguistic manifestations of normal children during the first year of life the authors determined a normal parameter of development. Features such as social smile, monosyllabic babbling, polysyllabic babbling and first words production were considered. The authors point out that although there are even universal patterns of language acquisition, it is important to consider that individual variation may occur in some cases and it doesn't mean a disorder. According to the authors, these qualitative and quantitative variations in the initial language components are actually essential to understand the mechanisms that underlie normal language development.

A study[6] conducted with 15 children involving the analysis of language level, from the pre-linguistic period to the construction of the first phrases has shown that during the pre-linguistic and phrase-word phases gestural and vocal communicative means are the most frequent.

Several authors mention the mother's importance during the process of play construction and language development. She is the child's first interlocutor and has a privileged position in interaction and symbolic construction by the child[1,2,7,8].

Pragmatics, under a functional perspective, offers tools to the assessment since the beginning of language development, i.e. the period prior to the first words, and consider non-verbal and interactive aspects in the analysis. This theory supported several studies[9-11], either to understand the initial period of language acquisition as to the comparative analysis of situations when speech is absent or language is impaired.

To understand what happens with babies and children during the period prior to the speech onset and its initial phases is essential to the speech and language pathologist that wants to follow-up this process. Therefore, the aim of this study is to present information to the analysis and discussion about the communication development during the pre-verbal period.

CLINICAL CASE PRESENTATION

The present research and the consent form signed by the parents were approved by the Ethics Committee of the School of Medicine of the Universidade de São Paulo (FMUSP) with number 347/97. The case reports starts with a description of the analyzed corpus that is followed by the synthesis of the data referring to the pragmatic aspects of each subject's communication. This includes data about the number of communicative acts expressed per minute, occupation of the communicative space, proportion of use of communicative means and the proportion of use of more interpersonal communicative functions.

This study's corpus refers to the follow-up data about six children. Three of them were followed from the 1st to the 15th month and the other three from the 18th to the 36th month. The subjects were filmed during 30 minutes every three months while interacting with their mothers during everyday life situations such as feeding, hygiene and play.

Chart 1. Sample description

Ages	Subjects	Recordings (months)	# of tapes	Duration of each tape (minutes)
0 to 15 months	1, 2 & 3	1	3	90
		3	3	90
		6	3	90
		9	3	90
		12	3	90
		15	3	90
18 to 36 months	4, 5 & 6	18	3	90
		21	3	90
		24	3	90
		27	3	90
		30	3	90
		33	3	90
		36	3	90
Total			39	1170

The total number of communicative acts expressed by the subjects in each sample was considered (Table 1). The data show great individual variations. Nevertheless, there is a tendency towards increasing the total number of communicative acts with increasing age.

Regarding the number of communicative acts expressed per minute there was a gradual and constant increase from the 1st to the 15th month of life (Table 2). From then on there was a

Table 1. Distribution of the total number of communicative acts produced in each 30 minutes sample

Subjects	1m	3m	6m	9m	12m	15m	18m	21m	24m	27m	30m	33m	36m
1	7	36	68	70	93	111							
2	10	22	61	50	91	135							
3	51	34	69	86	73	73							
4							137	243	188	148	216	176	208
5							228	205	166	128	196	234	135
6							170	161	154	111	173	180	181

Note: m = months

certain balance with small variations until the 33th month and a significant increase on the 36th month. The general mean of occupation of the communicative space varied from 35% (on the 1st month) to 45% (on the 6th and 12th months). Based on these data it was possible to note that, contrary to what was observed with the number of communicative acts expressed, there is not a gradual increase in the occupation of the communicative space by the children as they grow. The smallest proportion was observed during the 1st month and, from the 3rd month on it is possible to observe variations that never reach bellow the 1st month level. These variations may represent the search of balance by the dyad. This movement is apparently conducted by the mother that increases or decreases her communicative demands, adjusting to the child's communicative abilities development.

Table 2. Distribution of the mean number of communicative acts produced per minute and the occupation of the communicative space by the children during each 30 minute sample

Age (months)	Communicative acts per minute (mean)	Ocupation of the communicative space (%)
1	0.7	33
3	1.2	33
6	2.6	53
9	2.7	38
12	2.8	43
15	3.6	44
18	3.5	38
21	3.5	42
24	4.4	38
27	4.1	36
30	4.5	44
33	4.4	44
36	6.0	41

In what refer to the communicative means and communication's interactivity, the gestural mean was the most used from the 1st to the 24th month (Table 3). After this age the verbal mean is the most frequently used, but the use of the gestural mean remains significant. The use of the verbal communicative mean had its first occurrence during the 6th month. With increasing age the children increase their use of the verbal mean and lessen the use of vocal and gestural means. However, despite the fact that the use of the gestural mean has shown a steady decrease until the 36th month, its occurrence remained significant. The proportion of communication's interactivity was always around 50%, what seems to suggest that the baby seeks communicative interaction since birth.

DISCUSSION

Although there are recent studies that confirm the possibility of use of shorter samples o the analysis of the Functional Communicative Profile[10,12], the authors opted for 30 minutes samples in this study. It was considered that it would be important that the sample allowed the register of the babies' different rhythms along the development. This variation was evident in all the analyzed aspects.

The individual analysis of the number of communicative acts produced in each sample shows an almost constant increase tendency. However, individual variations also occur. Just one of the six children kept a constantly increase in this variable. Although the number of subjects does not allow generalizations, the consistency of the upward movement, with slight regressions, seems to agree with prior descriptions about the developmental process[13].

The upward movement observed until the 15th month and the stability with very slight regressions up to the 33th month and a

Table 3. Distribution of the mean proportion of use of the communicative means and interactive communicative functions in each 30 minute sample

Subjects	1m	3m	6m	9m	12m	15m	18m	21m	24m	27m	30m	33m	36m
%VE	0	0	1	0	1	4	8	43	55	39	61	59	59
%VO	60	59	35	27	39	47	3	25	15	16	9	15	15
%G	82	75	75	82	69	70	70	48	41	58	43	42	38
% IF	50	44	59	55	64	67	61	68	72	75	70	66	63

Note: VE = verbal; VO = vocal; G = gestural; IF = interpersonal communicative functions

large increase on the number of communicative acts expressed by minute on the 36th month confirm those observations[5]. On the other hand, the occupation of the communicative space has shown larger and more frequent variations that nevertheless continue to show evolution. In this sense, it is fundamental to consider that the adult of the dyad was the mother, who knows the communicative needs of her child. The mother is the facilitator in this process and during the data gathering moments places the child as the central focus of her attention[1,2,7,8,14].

Prior studies suggest that the child learns to use language, i.e. to communicate, even before learning the formal aspects of language, using the available resources (mainly gestures and vocalizations) to convey meaning. The child's sensory and expressive equipment facilitates communication since birth with interacting and learning with the others working as mediators in these processes[14,15]. It becomes evident in the analysis of the use of the communicative means by the subjects of this study. The follow-up analysis allowed the observation of the proportion of use of the verbal mean and its fundamental role on the children's communication after the 21th month. In this period the verbal mean is already more frequent then the vocal mean and after the 30th month it is also more used than the gestural mean. The gestures, however, continue to be responsible by an important part of communication[6].

The data has shown that the babies seek communication's interactivity since the first days of life. Prior studies with older children(13) and babies(1) concluded that the larger part of children's communicative acts have interpersonal functions.

FINAL COMMENTS

Although the definition of canonic normality patterns were not the aim of this study, the identification of a significant proportion of communicative acts with more interpersonal functions in children followed-up during a large period of time strengthens the importance of improving studies about the initial period of language development. The present study confirms that there is communicative intent since birth. The baby interacts with the surrounding world and there is a qualitative and quantitative increase in communication abilities that follows the child development.

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