

# A emergência da comunicação expressiva na criança com síndrome de Down\*\*\*

## The emergence of expressive communication in the child with Down syndrome

Rosângela Viana Andrade\*  
Suelly Cecília Olivan Limongi\*\*

\*Fonoaudióloga. Doutora em Ciências pela Faculdade de Medicina da Universidade de São Paulo (FMUSP). Fonoaudióloga do Departamento de Fisioterapia, Fonoaudiologia e Terapia Ocupacional da FMUSP.  
Endereço para correspondência:  
Avenida Coronel José Pires de Andrade, 845 - Apto. 181 - São Paulo - SP - CEP 04295-001  
(rva@usp.br).

\*\*Fonoaudióloga. Professora Livre-Docente e Professora Associada do Departamento de Fisioterapia, Fonoaudiologia e Terapia Ocupacional da FMUSP.

\*\*\*Trabalho Realizado Laboratório de Investigação Fonoaudiológica em Síndromes e Alterações Sensorio-Motoras do Curso de Fonoaudiologia do Departamento de Fisioterapia, Fonoaudiologia e Terapia Ocupacional da FMUSP.

Artigo Original de Pesquisa

Artigo Submetido a Avaliação por Pares

Conflito de Interesse: não

Recebido em 02.02.2006.  
Revisado em 02.01.2007; 31.07.2007;  
08.10.2007; 01.11.2007.  
Aceito para Publicação em 01.11.2007.

### Abstract

**Background:** expressive communication in the child with Down syndrome (DS). **Aim:** this study had as a purpose the qualitative and quantitative analyses of the different forms of communication in children with DS; the emergence of oral expression and its relationship with the use of gestures; the development of gestures and their qualification; the effectiveness of the dialectic-didactic method, based on the clinical method proposed by Piaget, as a form of speech-language intervention. **Method:** participants of this study were eight children with DS (ages between 33 and 52 months at the beginning of the research) - four composing the research group (RG) and four composing the control group one (CG1); and four children with normal development ND (ages between 14 and 16 months at the beginning of the research) - control group number two (CG2). All children presented cognitive development classified between the final sensory motor stage and the beginning of the pre-operational stage, and were assessed three times during a period of 12 months: initial, after six months and after twelve months. All assessments were recorded and transcribed. Toys, appropriate to the cognitive stage of the children, were used as materials during the assessments. The therapeutic process, exclusively for the RG, consisted of 40 therapy sessions, using similar materials to those used at during the assessments. **Results:** children in the RG developed better than children in CG1. Children who expressed themselves better were those who presented a better cognitive development. **Conclusion:** it was possible to confirm the effectiveness of the dialectic-didactic method as a therapy method, shown through the language development of the RG when compared to GC1.

**Key Words:** Down Syndrome; Oral Language; Gestures.

### Resumo

**Tema:** a comunicação expressiva na criança com síndrome de Down (SD). **Objetivo:** este trabalho teve por objetivo o estudo qualitativo e quantitativo das diferentes formas de expressões comunicativas em crianças com SD; a emergência da sua expressão oral e sua relação com os gestos; a evolução dos gestos e a sua qualificação. Também se pesquisou a efetividade da terapia fonoaudiológica na criança com SD segundo o método dialético-didático, fundamentado no método clínico de Piaget. **Método:** participaram deste estudo oito crianças com SD (faixa etária entre trinta e três e cinquenta e dois meses, no início da pesquisa), quatro constituindo o grupo pesquisa (GP) e quatro o grupo controle 1 (GC1); e quatro com desenvolvimento típico (DT) (faixa etária entre quatorze e dezesseis meses, no início da pesquisa), ou grupo controle 2 (GC2). Todas apresentavam desenvolvimento cognitivo entre o final do período sensorio-motor e início do pré-operatório, e foram avaliadas três vezes: inicial, após seis meses e após doze meses. As avaliações foram filmadas e transcritas. Os materiais utilizados foram brinquedos apropriados para a fase de desenvolvimento cognitivo apresentado pelas crianças. O processo terapêutico, apenas para o GP, constou de quarenta sessões terapêuticas, com materiais semelhantes aos das avaliações. **Resultados:** verificou-se que GP teve melhor evolução que GC1. Os sujeitos que melhor conseguiram se expressar foram os que apresentaram melhor evolução no desenvolvimento cognitivo. **Conclusão:** foi possível confirmar a eficácia do método dialético-didático como processo terapêutico, demonstrada na evolução do desenvolvimento da linguagem do GP em relação ao GC1.

**Palavras-Chave:** Síndrome de Down; Linguagem Oral; Gestos.

Referenciar este material como:



Andrade RV, Limongi, SCO. The emergence of expressive communication in the child with Down syndrome (original title: A emergência da comunicação expressiva na criança com síndrome de Down). Pró-Fono Revista de Atualização Científica. 2007 out-dez;19(4):387-92.

## Introduction

Cognitive and linguistic development occur in similar patterns in the child with Down syndrome (DS) and in the child with typical development (TD). They are, nevertheless, delayed and slower, with cognitive development achieving more efficiency than the linguistic one(1-3). In this aspect, comprehension has a better development than expression(4).

The time span between the initial word understanding during lexical-semantic development and oral production in the child with DS is much larger than in the child with TD (TD: 12 months; DS: 24 months). The vocabulary of DS children doesn't expand so quickly and it can be observed a certain tendency for the production of simple phrases, with missing articles, propositions and pronouns (4-11).

To compensate for the delay in oral production several children with DS show a significant development of gestual communication that can vary according to the environmental context as a means of making themselves better understood by the communicative partner (12-14).

In these cases, instead of predominant use of speech with gestures as support during the vocabulary amplification period, as happens with children with TD, children with DS keep on using gestures simultaneously to the spoken word. Or they can even use them above the spoken words, as if these were the linguistic support and not the contrary (4,12,13, 15-18).

Aiming to improve language development of children with DS, this paper has the purpose to study qualitatively and quantitatively the different forms of communicative expression in this population. The study verified: the onset of oral expression and its relation to gestures during communication; the evolution of gestures and its qualification; the effectiveness of speech-language therapy to the language development of children with DS based on the dialectic-didactical method (19). This method is based on the clinical method proposed by Piaget and is based on the building of knowledge through problem-situations, with the active intervention by the researcher during the process, aiding the child in the knowledge reorganization.

## Method

This research was approved by the ethical committee of the institution and parents of all

children signed the consent form. The institutions to which the children attended also authorized the research.

Subjects were 12 children: eight with DS (ages 36 to 52 months on the beginning of the research). Four of them were the research group (RG) and the other four were the control group (CG1). The other four subjects were children with TD (ages 14 to 16 months on the beginning of the research) and formed the control group 2 (CG2). All subjects presented cognitive development between the end of the sensorial-motor period and the beginning of the pre-operational period.

The exclusion criteria for RG and CG1 were: heart or lung conditions, associated visual or auditory deficits, other psychiatric or psychological disorders of neurological etiology. The inclusion criteria were: cognitive development between the end of the sensorial-motor period and the beginning of the pre-operational period (20); observable communicative intent. CG1 subjects should have received or be presently receiving early speech-language stimulation. RG subjects should attend the specialized speech and language service at LIFSASM. Subjects were of both male and female genders, two boys and two girls in each group.

Subjects of CG1 were considered controls because besides presenting DS and chronological ages close to the RG, the speech-language therapy intervention they received had different theoretical-methodological approaches than the one provided to the RG.

Using a second control group (CG2) was necessary because they were children with language and cognitive development adjusted to their chronological ages and therefore fundamental parameters to the analysis and observation of the other two groups.

The procedures included three 30 minute assessments in the period of 12 months: at the beginning, after six months and after 12 months, at the end of the study. All of them were video taped and transcribed to insure the objectivity of observations which data would be qualitatively analyzed (21).

The therapeutic process to RG consisted of 40 therapeutic sessions conducted once a week after the initial assessment. The dialectic-didactical method (19) was used aiming to improve the child's communication, specially the oral language within a certain context, prompting its use through objects and actions naming and in situations where the child had the need to express. Therapy sessions were also filmed and transcribed every two weeks.

The material used in the assessment and therapeutic sessions with the RG was age and development appropriate toys, with the same toys to all assessment sessions and similar ones to the therapeutic sessions.

Data were recorded in protocols of analysis built by the researcher and that provided easy visualization of the moments in which the subjects used just oral language (OL) or gestual communication (GC) or even both simultaneously (OLGCS) to express themselves. 20% of the transcriptions were reviewed by three judges with the same background on the field as the researcher. Such procedure was necessary in order to guarantee the precision and reliability of the information obtained (22).

Data were qualitatively and quantitatively analyzed.

The criteria to the qualitative analysis of OL were based on linguistic concepts (morph- syntactic analysis). To GC (gestures and facial expression) they were adapted from other studies on the issue (4,12) and to OLGCS both kinds of criteria were used.

To the quantitative comparison of data the Kruskal-Wallis, Mann-Whitney, Friedman and Wilcoxon non-parametric tests were used and complemented by the confidence interval technique. The significance level was determined in 10%.

## Results

Results refer to OL (word classes), GC and OLGCS of the three assessments of three groups (RG, CG1 and CG2), between groups and within groups. Results of CG2 will be presented first because they refer to children in TD and its results are essential to the between groups analysis.

The analysis between groups will be presented through tables.

### Within groups analysis

#### Results of CG2

During the onset of expressive communication of these subjects occurred an evolution from GC through OLGCS and than to OL.

It was observed that at first the gestures that represented semantic content were the most used and latter there was an increase also in the use of gestured as showing. Simultaneously, the number of word classes also increased, specially those of verbal and substantives. In this period,

communicative expressions of the subjects constituted basically of OLGCS.

During the last assessment there was a general decrease in the number of gestures and an increase in word classes (larger number of verbs) in all subjects, indicating that they were using predominantly OL in their communication, with the few gestures as support to the use of words.

#### Results of RG

Contrary to CG2 the majority of RG subjects started with a predominantly gestual communication and later, while half of them evolved to OLGCS, the other half evolved to a larger variation of GC.

As occurred with CG2, at first, the majority of gestures presented by the subjects of this group represented semantic content. Latter, with OLGCS, some deictic occurred also.

In what refer to word utterances, substantive was the class most frequently used by some subjects of RG, followed by verbs in OLGCS, during the three assessments. Such data are similar to the ones obtained with CG2. But in OL the situation observed was the opposite, that is, verb was the most frequent class, followed by substantive.

In the course of the assessments it was observed that S1 communicated mostly with OLGCS with an increase in the number of words produced, indicating that this subject was evolving to the utterance of phrases composed only by words and that the gestures were being replaced by words.

Among subjects of RG, subject 2 (S2) was the only one that presented predominant evolution of GC during the three assessments. Gestures varied according to environmental context, in order to be understandable by the communicative partner. The few words produced by S2 had just the function of linguistic support to gestures.

Subject 3 (S3) started with predominantly OLGCS communication but evolved to GC, that was delayed, if compared to S2.

Subject 4 (S4) presented communicative expressions mostly by GC and evolved to OLGCS.

#### Results of CG1

Subjects of presented communicative expression development similar to RG, but in an even more delayed and slow pattern.

It was observed that CG1 subjects presented fewer gestures, with less variation. The most

frequent gestures, when just GC was used, were the ones that represented semantic contents. With OLGCS the most frequent gestures were deictic, as occurred with RG.

Subjects 5 and 7 (S5 and S7) presented predominantly GC with few variations on the kinds of gestures.

Subjects 6 and 8 (S6 and S8) used more OLGCS to communicate. It was observed that only S6 presented more gestures than words from the first assessment while S8 evolved from a larger number of gestures to a larger number of words.

In what refer to the presence of OL in this group, S8 was the subject that produced the larger number of words, with or without the support of gestures.

The most frequent word classes of the linguistic repertoire of some of the subjects of CG1 were substantive and verb. Substantives were more frequent than verbs with OLGCS while during spontaneous OL both verb and substantive had similar frequency.

Between group analysis:

When just OL was used it was observed a statistically significant mean difference in the number of different words. To identify this difference a two by two comparison of groups was made, as observed in Table 1.

It can be observed that CG2 is considered statistically different from the other groups that, on the other side, are similar to each other.

In what refer to the total number of word classes it was observed a statistically significant mean difference between groups. To identify this difference a two by two comparison of groups was made, as observed in Table 2.

It can be concluded that CG2 is again statistically different from the other groups that, in turn, are similar to each other.

Statistically significant differences of p-values of the three groups either in the occurrence of GC (different kinds of gestures) or OLGCS were not observed. We can say that the three groups had statistically similar behavior in the both forms of communication.

TABLE 1. Comparison of p-values of number of different words of the three groups (p-values).

<i>Oral language</i>	<i>RG</i>	<i>CG1</i>
CG1	0.361	
CG2	0.052*	0.011*

TABLE 2. Comparison of p-values of number of total numbers of word classes of the three groups (p-values).

<i>Oral language</i>	<i>RG</i>	<i>CG1</i>
CG1	0.374	
CG2	0.062*	0.019*

## Discussion

It can be stated that the results obtained confirm literature data. The vocabulary of children with DS (RG and CG1) did not expand as it was observed in children with TD (CG2).

On the other hand there was a difference in the production of word classes during spontaneous OL and OLGCS to RG and CG1 when compared to children with TD. In the first case, while substantive was the class more used by some subjects, followed by verb, as occurred with CG2 and according to the literature (5-7, 10). In the second, the opposite occurred, with verb as the most frequent class, followed by substantive.

In the between-groups analysis of GC and OLGCS it wasn't observed a statistically significant difference on the three groups. But in the within-groups analysis gestures presented by some children with DS evolved as in the children with TD, but lasting longer, as observed by other authors (4, 12, 13, 17). In some cases they accompany OL, in others, as the children with DS increased the number of word classes, the use of gestures decreased, as described in the literature (16-18).

According to between-groups comparisons and some studies (1, 3) on the issue, it was verified that despite RG and CG1 were constituted by children with DS with close chronological age and similar cognitive developmental phase, this development presented itself differently in each group, what, consequently interfered in the development of communicative expression.

The better development of RG when compared

to CG1 is related to the use of the dialectic-didactic method (19) during the speech-language therapy process with the first group. It becomes evident when it is presupposed that subjects of both groups were in the same cognitive developmental stage in the beginning of the research.

## Conclusion

Based on the results obtained with subjects of RG, CG1 and CG2, it can be conclude that:

. in what refer to the onset of OL and its relation to GC, it was verified that in the child with DS gestures developed before OL as occurs in the child with TD, but lasted longer. In some cases gestures were used accompanying words and, with lexical development, there was a decrease in its use. In other cases they were used replacing OL according to the context, to make them understandable by the partner;

. in what refer to gestures evolution qualification, children with DS that presented OLGCS decreased the amount of gestures while increased their vocabulary without stopping to use them for a long period. Others increased the amount of gestures and decreased the OL development and, in this case, GC varied according to the number and kinds of gestures;

. the dialectic-didactic method favored the language development and oral expression in children with DS from GC as can be verified by the evolution presented by RG during and after the speech-language intervention, comparing to the development of children of CG1.

## References

1. Limongi, SCO, Andrade, RV, Lima, FAGF, Alabarse, VM, Perez, VM. Processo terapêutico fonoaudiológico realizado com um par de gêmeos portadores de síndrome de Down. *Pró-Fono Revista de Atualização Científica*, 2000;12(1):24-33.
2. Andrade, RV. Trabalho de reeducação quanto à comunicação oral de crianças com alterações sensório-motoras de origem síndrômica (0 a 3 anos): enfoque na orientação às mães. [Dissertação]. São Paulo (SP): Faculdade de Educação, Universidade de São Paulo; 2002.
3. Johnson-Glenberg, MC, Chapman, RS. Predictors of parent-child language during novel task play: comparison between typically developing children and individual with Down syndrome. *J Intellect Disabil*. 2004 mar;48(3):225-38.
4. Iverson, JM, Longobardi, E, Caselli, MC. Relationship between gestures and words in children with Down's syndrome and typically developing children in the early stages of communicative development. *Int. J. Lang. Comm. Dis.* 2003;38(2):179-97.
5. Camaioni, L, Longobardi, E. Noun versus verb emphasis in Italian mother-to-child speech. *J. Child Lang.* 2001 oct;28(3):773-85.
6. Colombo, L, Burani, C. The influence of age of acquisition, root frequency, and context availability in processing nouns and verbs. *Brain Language*. 2002 apr-jun;81(1-3):398-411.
7. Grella, BG. Do children with Down syndrome have difficulty with argument structure? *J. Commun. Disord.* 2003 jul-aug;36(4):263-79.
8. Brock, J, Jarrold, C. Language influences on verbal short-term memory performance in Down syndrome: item and order recognition. *J. Speech Lang Hear Res.* 2004 dec;47(6):1334-46.
9. Hick, RF, Botting, N, Conti-Ramsden, G. Short-term memory and vocabulary development in children with Down syndrome and children with specific language impairment. *Dev Med Child Neurol.* 2005 aug;47(8):532-8.
10. Jones, SS, Smith, LB. Object name learning and object perception: a deficit in late talkers. *J Child Lang.* 2005 feb;32(1):223-40.
11. Ypsilanti, A, Grouios, G, Alevriadou, A, Tsapkini, K. Expressive and receptive vocabulary in children with Williams and Down syndromes. *J. Intellect Disabil Res.* 2005 may;49(5):353-64.
12. Franco, F, Wishart, JG. Use of pointing and other gestures by young children with Down syndrome. *American Journal on Mental Retardation.* 1995;100(2):160-82.
13. Chan, JB, Iacono, T. Gesture and production in children with Down syndrome. *AAC Augmentative and Alternative Communication.* 2001 jun;17:73-87.
14. Miles, S, Chapman, RS. Narrative content as described by individuals with Down syndrome and typically developing children. *Journal of Speech, Language, and Hearing Research.* 2002 feb;(45):175-89.
15. Namy, LL, Waxman, SR. Patterns of spontaneous production of novel words and gestures within an experimental setting in children ages 1;6 and 2;2. *J Child Lang.* 2002 nov;29(4):911-21.
16. Meeachern, D, Haynes, WO. Gesture-speech combinations as a transition multiword utterances. *Am J Speech Lang Pathol.* 2004 aug;13(3):227-35.
17. Iverson, JM, Goldin-Meadow, S. Gesture paves the way for language development. *Psychol Sci.* 2005 may;16(5):367-71.
18. Ozcaliskan, S, Goldin-Meadow, S. Gesture is at the cutting edge of early language development. *Cognition.* 2005 jul;96(3):B101-13.
19. Parrat-Dayán, S. Processos internos y externos en la construcción de una explicación causal. In: Assis, MC, Assis, OZM, Ramozzi-Chiarottino, Z. (org.). *Piaget: teoria e prática - IV simpósio internacional de epistemologia genética, XIII encontro nacional de professores do PROEPRE.* 1996. p. 28-45.
20. Piaget, JA. *formação do símbolo na criança.* Rio de Janeiro: LTC Editora, 1990, edição original de 1946.
21. Steinke, EE. Use of videotaped interventions in research. *West J Nurs Res.* 2001 oct;23(6):627-43.
22. Scarsellone, JM. Analysis of observational data in speech and language research using generalizability theory. *Journal of Speech, Language and Hearing Research.* 1998 dec;41:1341-47.