

# COMMUNICATIVE AND LEXICAL SKILLS IN CHILDREN WITH DOWN SYNDROME: REFLECTIONS FOR INCLUSION IN SCHOOL

## *Habilidades comunicativas e lexicais de crianças com síndrome de Down: reflexões para inclusão escolar*

Dionísia Aparecida Cuisn Lamônica <sup>(1)</sup>, Amanda Traqueta Ferreira-Vasques <sup>(1)</sup>

### ABSTRACT

**Purpose:** to investigate the communicative and expressive lexical performance of children with Down syndrome and reflect on how the understanding of interfering factors in the learning process can contribute to better adaptation of these children at school. **Methods:** the proposed sample was 60 children, but after analysis of the inclusion criteria, involving 20 children, 10 with Down syndrome and 10 with typical neurodevelopment, age between 36 and 62 months, and matched according to gender, chronological age and socioeconomic status. Procedures: interview with family members, Observing the Communicative Behavior and Child Language Test ABFW-Vocabulary Part B. Data analysis was performed using descriptive statistics and application of the test “t” Student ( $p \leq 0.05$ ). **Results:** indicated a statistically significant difference for the production of words and phrases, narrative, attention span, usual verbal designation and not name. For replacement processes the statistical analysis showed no statistically significant difference. Just to occupations and places in this category, there was a statistically significant difference between groups. How are reviewed nine conceptual fields, this data did not affect the sum of the statistical analysis of the values of all fields. **Conclusion:** the communicative and expressive lexical performance of children with Down syndrome is lower when compared to children with typical neurodevelopment. The school plays an important role in providing a stimulating environment through appropriate teaching practices to the learning needs of these children.

**KEYWORDS:** Down Syndrome; Vocabulary; Mainstreaming (Education)

### ■ INTRODUCTION

One of the crucial elements in the learning process of children with Down syndrome (DS) is language development<sup>1</sup>. Language mediates social, academic and learning activities that are dependent on receptive and expressive linguistic processes, as well as psycholinguistic skills that provide knowledge integration and the possibility of social interaction. The way children are integrated in the

social environment, building their language with their interlocutors in interactive and dialogic relations has important consequences for global development and learning<sup>2</sup>. Thus, it is of utmost significance to establish these interactions and integration of children with DS, who have as their greatest ally the mainstreaming into the education network<sup>1,3-5</sup>.

Children’s school admittance, as well as their adaptation and learning, are concerns of parents and faculty members. Many studies address the issue of education and learning in DS individuals<sup>1,3-6</sup>.

DS children show global delays in their development with important consequences to language development<sup>7-10</sup> and school education<sup>4,11-13</sup>. These global delays are related to alterations in

<sup>(1)</sup> Faculdade de Odontologia de Bauru da Universidade de São Paulo (FOB/USP), Bauru, SP, Brasil.

Research support: FAPESP (Fundação de Amparo à Pesquisa do Estado de São Paulo – São Paulo Research Foundation).

Conflict of interest: non-existent

motor, cognitive, linguistic, social and self-care development<sup>14-16</sup>.

Regarding language development, studies<sup>8,13,17-24</sup> described that these children show difficulties. Authors have shown the lexical acquisition, although delayed, follows the same development route<sup>24</sup>. Other studies<sup>6,10,13,23-25</sup> also pointed out the need to verify receptive and expressive skills that can be more limited in DS individuals. To compensate their oral production delay, many children use sign language for longer periods, aiming to improve their interlocutor comprehension<sup>13, 19-21,23,26</sup>. This behavior must be understood by parents and teachers so that they can optimize the communicative development, favoring this child's mainstreaming process in the school setting.

Children with DS present various communicative behaviors, showing heterogeneity in their personal functioning<sup>1,10,25</sup>, affected by characteristics of health and stimulation from the social settings they take part, including the family and school settings<sup>4,10,14,22</sup>. The lexical performance will reflect the child's ability to comprehend and elaborate enunciation that will always be present in their communicative environment and will facilitate and promote information exchange with interlocutors, allowing and permeating the learning process and the global development.

Considering the above-mentioned, the objective of this study was to verify the expressive lexical and communicative performance of children with Down syndrome and reflect on how the understanding of factors interfering in the learning process can contribute to a better adaptation of these children in the school setting.

## ■ METHODS

The project was approved by the Ethics Committee on Human Research of the Bauri School of Dentistry, University of São Paulo, where the research was developed (Protocol: 040/2009).

The following criteria of inclusion were followed. For the experimental group (EG): children with chronological age between 36 and 62 months, diagnosed with DS (by Trisomy 21 after karyotype); born at term; weighting between 2500 and 4000 grams; with normative results in the Auditory, Visual and Metabolism Screenings (congenital hypothyroidism and phenylketonuria); absence of characteristics of the Autism spectrum disorder; absence of major visual and hearing impairments that could affect or disable the completion of the proposed activities; who had attended rehabilitation services (physiotherapy, speech therapy or others according

to the individual needs) since the first trimester of life and attended regular school (public).

For the comparative group (CG), the criteria of inclusion were: children with typical development, paired with the EG according to gender, chronological age, education and socioeconomic level; born at term; weighting between 2500 and 4000 grams; with standard neuropsychomotor development; normative results in the Auditory, Visual and Metabolism Screenings (congenital hypothyroidism and phenylketonuria); absence of characteristics of the Autism Spectrum Disorder; absence of major visual and hearing impairments that could affect or disable the completion of the proposed activities; who attended regular school (public).

A total of 31 children with DS, in the target age group of this research, were evaluated. After the fulfillment of all inclusion criteria, 21 children were excluded: three showed congenital hypothyroidism, three were born with very low birth weight, two were born preterm, two showed signs of the Autism Spectrum Disorder, one failed the auditory evaluation, four did not attend early rehabilitation procedures and six were not attending public school.

Thus, the participants were divided in Experimental Group (EG): 10 children with DS and Comparative Group (CG): 10 children with typical neurodevelopment, paired according to gender, chronological age, education and socioeconomic level with the EG.

After the signature of the Informed Consent Form, the children legal guardians answered an anamnesis protocol with early life information regarding pregnancy and delivery conditions, diagnosis process, neuropsychomotor and linguistic development, tests undertaken (auditory, visual and metabolism), school life and other health issues.

## Characterization of the casuistry

The chronological age of the participants (EG and CG) ranged from 36 to 62 months (mean of 41 months); 60% male and 40% female. The socioeconomic level of the participants was distributed among the social classes B1 (40%), B2 (50%) and C1 (10%) (CCSB, 2012)<sup>27</sup>. Regarding the education, all participants attended public kindergarten. The children with DS attended classes with children from the same age group, although 60% of the children were not able to follow the educational program proposed, according to the guardians' report. All children from the EG did weekly speech therapy and 30% of them did physiotherapy.

Children were evaluated through Communicative Behavior Observation<sup>28</sup> (CBO) and application of the ABFW Child Language Test -Vocabulary Part B<sup>29</sup>.

Communicative Behavior Observation<sup>28</sup> (CBO): the participants performed a session of playful and interactive activities with the evaluator, in which concrete objects were offered to verify their actions and interactions. These situations were developed on a child table, in a quiet and structured setting. The guardian of the child was present but did not participate in the activities/games. The session was recorded for later analysis. In this procedure, the communication skills of the participants were analyzed, including dialogical and conversational skills, contextualization of language, verbal comprehension, ways of manipulation and functional use of objects, symbolism, toy organization and imitation.

The analysis of the observation was performed to verify the occurrence of the communicative categories: Communicative intention (CI); Interaction with the evaluator (IE); Eye gaze (EG); Start dialog (SD); Maintain dialog (MD); Word production (WP); Production of phrases with more than two elements (PP); Comprehend simple orders (CS); Perform simple orders (PO); Comprehend complex orders (CC); Perform complex orders (PC); Narrative (NA); Symbolic play (SYP); Proper attention span (AS); Inform function (IF); Protest function (PF); Request function (RF); Offer function (OF) and Imitation (IM).

The analysis categories of the communication behavior were calculated by attributing scores to each communicative category afore described, with the following criterion: 0 – did not show; 1 – showed in restricted situations of self-interest; 2 – showed in any situation. For the statistical treatment, we carried out the sum of the points of the communicative categories obtained after the analysis of the recordings.

The ABFW Child Language Test - Vocabulary Part B<sup>28</sup> evaluates expressive vocabulary in nine conceptual fields: clothing, animals, food, means of

transportation, furniture and utensils, occupations, places, shapes and colors, toys and musical instruments, which were always evaluated in the same sequential order; the answers of the participants were recorded and written down in a specific protocol for later analysis. The rules proposed by the Instruction Manual for Analysis of Answer Categories were followed, divided in usual verbal designation (UVD – correct image naming, disregarding possible alterations in the phonetic or phonologic production), no-designation (ND – no naming) and substitution processes (SP – production of another word, functionality, onomatopoeia or representative gesture). The result was evaluated only according to the amount of answers in each one of the three analyzed categories, without considering or analyzing the typology of the substitution process carried out. After finding the sum and the mean of the performance in the nine conceptual fields, a percentage value was attributed to the answers of the participants in these three categories of analysis.

Data analysis was carried out through descriptive statistics and the application of the Student's t Test ( $p \leq 0.05$ ).

## ■ RESULTS

Table 1 presents the statistical analysis by means of the Student's t Test to compare the CBO categories analyzed between the CG and the EG.

Table 2 compares the performance of the CG to the EG in the ABFW test in the categories: usual verbal designation (UVD), no designation (ND) and substitution process (SP) by means of the Student's t test.

**Table 1 – Categories of the Communicative Behavior Observation for the Control Group and the Experimental Group**

| CBO | GC   |  | EG   |  | p value<br>( $\leq 0.05$ ) |
|-----|------|--|------|--|----------------------------|
|     | Mean |  | Mean |  |                            |
| CI  | 2.00 |  | 1,70 |  | 0.280                      |
| IE  | 2.00 |  | 1.50 |  | 0.063                      |
| EG  | 2.00 |  | 1.60 |  | 0.143                      |
| SD  | 2.00 |  | 1.00 |  | 0.063                      |
| MD  | 2.00 |  | 1.00 |  | 0.063                      |
| WP  | 2.00 |  | 1.00 |  | 0.023*                     |
| PP  | 2.00 |  | 0.80 |  | 0.023*                     |
| CS  | 2.00 |  | 1.90 |  | 0.739                      |
| PO  | 2.00 |  | 1.50 |  | 0.063                      |
| CC  | 2.00 |  | 1.30 |  | 0.063                      |
| PC  | 2.00 |  | 1.00 |  | 0.063                      |
| NA  | 2.00 |  | 0.50 |  | 0.000*                     |
| SYP | 2.00 |  | 1.50 |  | 0.063                      |
| AS  | 2.00 |  | 1.40 |  | 0.023*                     |
| IF  | 2.00 |  | 1.10 |  | 0.063                      |
| PF  | 2.00 |  | 1.60 |  | 0.280                      |
| RF  | 2.00 |  | 1.30 |  | 0.063                      |
| OF  | 2.00 |  | 1.10 |  | 0.063                      |
| IM  | 2.00 |  | 1.80 |  | 0.481                      |

\* Statistically significant result after the application of the Student's t Test. Communicative Behavior Observation (CBO); Control group (CG); Experimental group (EG); Communicative intention (CI); Interaction with the evaluator (IE); Eye gaze (EG); Start dialog (SD); Maintain dialog (MD); Words production (WP); Production of phrases with more than two elements (PP); Comprehend simple orders (CS); Perform simple orders (PO); Comprehend complex orders (CC); Perform complex orders (PC); Narrative (NA); Symbolic play (SYP); Proper attention span (AS); Inform function (IF); Protest function (PF); Request function (RF); Offer function (OF) and Imitation (IM).

**Table 2 – Comparison between the performance of the Control Group and the Experimental Group in the ABFW Child Language Test**

| ABFW | CG     |       | EG     |       | p value       |
|------|--------|-------|--------|-------|---------------|
|      | Medium | D.P.  | Medium | D.P.  |               |
| UVD  | 56.66  | 16.61 | 13.35  | 19.22 | $\leq 0.05^*$ |
| ND   | 1.99   | 3.58  | 54.94  | 41.64 | $\leq 0.05^*$ |
| SP   | 41.40  | 16.15 | 31.93  | 30.44 | $\geq 0.05$   |

ABFW Child Language Test - Vocabulary Part B (ABFW); Control group (CG); Experimental group (EG); Usual Verbal Designation (UVD); No designation (ND); Substitution process (SP).

\* Statistically significant result after the application of the Student's t Test.

## ■ DISCUSSION

The EG showed communication patterns inferior to the ones expected to that age group. However, in the comparison with their pairs in the CG, no significant difference, after statistical treatment, was found for the behaviors: communicative intention, interaction, eye gaze, start and maintenance of dialog (respect to turn-taking), vocalizations, comprehension and understanding of simple and

complex orders, symbolic play, and for the communicative functions: protest, request, inform, offer and imitate.

The delay in the development of communicative skills in individuals with DS is foreseen in the literature<sup>7,10,13,19,20,24,25</sup>, even though these individuals do not behave in a homogenous way<sup>10,24</sup>.

The communicative means must become efficient in the interaction of these children with their interlocutors, in the various environments

they attend, to provide a desirable communication between their pairs and favor learning.

The communicative behaviors must be valued and used when organizing the educational curriculum for these children, as these are ways that will favor the social integration and the learning of new knowledge, as well as the access of these children to interactive and dialogic activities<sup>2</sup>.

Among the categories evaluated in the CBO, the ones that presented statically significant differences were: attention span, enunciation production (utterance/speaking isolated words like baby, ball, etc.), phrases and narrative.

The attention is a cognitive process by which the organism focuses and selects stimuli, establishing a relation among them. Every learning process, even the most simple, needs this ability to be performed. Attention is influenced by internal and external factors. Among the internal factors, there are those processes involved in the functioning of the central nervous system and its maturation, as well as motivation. As external factors, there are the intensity and quality of stimuli, the contrast between them, the movement and incongruence<sup>30</sup>. When the child does not show enough attention span to the proposed activities, the learning process is compromised, interfering in the way the child will process the information to be learned. The propensity to redirect attention influences the way that lexical acquisition happens, directly interfering in the development of expressive language skills (production of words and phrases) as well as in the performance of communicative skills, such as, for instance, the narrative<sup>15</sup>.

The good performance in the communicative skills is elementary for the interaction with interlocutors and it is a means that will favor the child integration in every setting, mainly at school<sup>8,20-25</sup>.

In this study, the children with DS, in kindergarten age, showed knowledge, but with a lower performance compared to the CG regarding the use of verbal means. They often showed to recognize images or objects through gestures, which was observed during the communicative behavior observation.

One of the important indicators of the communicative intent is the use of gestures by the child, which can provide the possibilities of the communicative skills development<sup>7,19,21</sup>, since these develop before oral language and, in children with language delay, as foreseen in DS individuals, stay longer until these children have acquired further vocabulary and speech intelligibility<sup>13,21,26</sup>. The use of gestures, as it could be supposed, is not necessarily a disadvantage during the learning of oral language, since these play an important role in the

development of early communication, regardless of the oral production being already available. This can suggest that conceptual knowledge is present even before the child's ability to express it through speech.

The use of gestures is of utmost importance to the communication development and, especially, to the development of the linguistic levels. Teachers and other interlocutors must value the non-verbal communicative means, without excluding the possibility of associated verbalization. Ideally, the interlocutor should encourage the increase of verbal communication associated with gestures. This often occurs when the interlocutor comprehends the dialogic content, based on the interactive relation and the content to be transmitted, encouraging children to show their knowledge through their own means and offering possibilities to expand their knowledge through dialogical exchanges. This behavior can boost linguistic, social and academic development. This is everybody's responsibility: teachers, family and other people involved in the inclusion of these individuals in society<sup>2,3</sup>.

Studies have reported that children with DS tend to show a good performance in social skills, effective in socializing, even though fragile, regarding the communicative performance<sup>16</sup>. Thus, it is important to integrate them in the school setting, in the usual age of their peers, to develop skills such as self-care, socializing and communication<sup>1</sup>.

In Table 2, a significant statistical difference was found for UVD and ND in the comparison between groups. For the SP, no significant statistical difference was observed. Through the qualitative analysis of the nine conceptual fields, it was possible to verify a significant statistical difference for UVD and ND between the groups in all conceptual fields. Analyzing the SP category, it was verified a significant statistical difference between the EG and the CG only in the conceptual fields of occupations and places, which did not influence the statistical final result of the sum of the nine fields for this category.

In the usual verbal designation (UVD), from a conceptual point of view, the child was expected to perform the correct naming of the stimulus showed. The results found for the EG can reflect both the difficulty with the concept and with the use of one-dimensional material, through visual stimuli in images. These represent another stimuli dimension, not as concrete as the playful tridimensional material.

One study verified that individuals with DS showed a significant deficit in the semantic knowledge, which is an indicator of dissociation between image-word correspondence<sup>25</sup>. However, the use of one-dimensional material is part of the

routine of children who attend school in this age group.

The issue of how to present pedagogical material for children with DS must be considered by the teacher while building strategies for the development of academic contents. Depending on the children age and their development pace, activities with concrete materials must precede the activities with one-dimensional materials, such as the use of images. The teacher needs to be certain that the comprehension difficulty of the content is not linked to its dimension.

Regarding the qualitative analysis of the ND, it was inferred that children could not perform the designation for the requested stimulus due to a lack of stimulus recognition, not finding the verbal label, difficulty to grasp the distinctive visual features or the influence of the time span in the activity.

Regarding the SP, a different behavior between the groups was verified in the occupations and places categories. The acquisition of these conceptual fields indicates that children need experience and stimulation for the prior knowledge about them. For instance, to know a church or a river, it is necessary that the children, in this age group, had had prior experiences to recognize them and then, be able to name them in a one-dimensional material. Therefore, the acquisition of these contents requires experience and the construction of such concepts. It is noteworthy that phonetic and phonological dimensions were not considered in this process, that is, the SP dimension was evaluated only from the semantic point of view.

One study showed<sup>17</sup> that children with DS demonstrate abilities to learn verbal labels, even though they may need a longer period of time to incorporate and express their linguistic and non-linguistic experiences. Other studies have reported that to compensate the oral production alterations, lots of children with DS used gestural communication in order to support the words during the application of vocabulary tests<sup>18-20,21</sup>.

It is noteworthy the importance of guidance by relatives and other people who live with the child with DS concerning the expectations and their future with respect to academic learning. The DS diagnosis and the concepts that underline this syndrome, such as, for instance, “[there] will be development delays”, “will present intellectual disabilities”, among others, can carry negative expectations concerning the performance of these children and interfere in the stimulation and in their development as reported in literature<sup>14</sup>.

These study findings are relevant as children with DS in kindergarten age are inserted in educational settings and need the interlocutors’ comprehension

of their lexical and communicative skills. The need for curricular or stimuli presentation adjustments may arise to guarantee learning. Presenting gestures as a support for their verbal communication is a relevant factor that must be considered and explored. Family, teachers and everyone who lives with these children must always encourage them in order to understand them and integrate them in communicative activities and in the social setting.

School life allows the child to develop capacities to perform functional activities such as transit in the school environment, manage their self-care and personal needs, as well as learn with the acquisition of knowledge in specific areas of the academic contents<sup>4</sup>.

To believe in these children’s learning potential is to favor their development through stimulation, which is essential, regardless of dire predictions. Prejudice towards their abilities is often the most negative factor in the learning process. In this perspective, school will play an essential role in the inclusion of these individuals because it is not only a place of education and learning, but also of coexistence, social and emotional development, which are mediated by language, integrated by the interactive actions of interlocutors, who integrate and influence themselves, contributing to the full child development.

In this scenario, it is a responsibility of those involved in the learning process of children with DS to design strategies that will favor the development of each child in particular. These strategies must be related to short, medium and long term goals considering the school curriculum, interaction, communication and socializing. These reflections are essential to the adequacy of these variables, promoting the full mainstreaming of children with DS in the educational process.

## ■ CONCLUSION

The expressive lexical and communicative performance of the children with Down syndrome is inferior compared to children with typical neurodevelopment in the aspects of words and phrases production, narrative, attention span and image naming. These children showed relevant communicative possibilities, mostly with the use of non-verbal communication.

Reflecting on the learning process, it is noteworthy the school important role, especially the role of the teacher, to provide a stimulating environment by means of pedagogical practices that meet the needs of the children with Down syndrome in kindergarten age.

## RESUMO

**Objetivo:** verificar o desempenho comunicativo e lexical expressivo de crianças com Síndrome de Down e refletir sobre como a compreensão de fatores interferentes no processo de aprendizagem pode contribuir para uma melhor adaptação dessas crianças no ambiente escolar. **Métodos:** a amostra proposta foi de 60 crianças, porém, após análise dos critérios de inclusão, participaram 20 crianças, 10 com Síndrome de Down e 10 com neurodesenvolvimento típico, de idade entre 36 a 62 meses, pareadas quanto ao gênero, idade cronológica e nível socioeconômico. Procedimentos: entrevista com familiares, Observação do Comportamento Comunicativo e Teste de Linguagem Infantil ABFW–Vocabulário Parte B. A análise dos dados foi realizada por meio de estatística descritiva e aplicação do Teste “t” *Student* ( $p \leq 0,05$ ). **Resultados:** indicaram diferença estatisticamente significativa para produção de palavras e frases, narrativa, tempo de atenção, designação verbal usual e não designação. Para processos de substituição a análise estatística não acusou diferença estatisticamente significativa. Apenas para profissões e locais, nesta categoria, houve diferença estatisticamente significativa entre os grupos. Como são avaliados nove campos conceituais, este dado não interferiu na análise estatística da somatória dos valores de todos os campos. **Conclusão:** o desempenho comunicativo e lexical expressivo de crianças com Síndrome de Down é inferior quando comparado com crianças com neurodesenvolvimento típico. A escola tem importante papel em proporcionar um ambiente estimulador, por meio de práticas pedagógicas adequadas às necessidades de aprendizagem destas crianças.

**DESCRITORES:** Síndrome de Down; Vocabulário; Inclusão Educacional

## ■ REFERENCES

1. Dolva AS, Lilja M, Hemmingsson H. Functional performance characteristics associated with postponing elementary school entry among children with Down syndrome. *Am J Occup Ther.* 2007;61(4):414-20.
2. Millanez SGC, Matumoto MAS, Lamônica DAC. Logopedia y Educación Especial. In: Giroto CRM, Del-Masso MCS, Milanez SGC.; Sebastián E. (Orgs.). *Servicios de apoyo en Educación Especial: una mirada desde diferentes realidades.* Alcalá de Henares/Espanha: Servicio de Publicaciones da Universidad de Alcalá de Henares; 2014. p. 127-44.
3. Luiz FMR, Bortoli PS, Flória-Santos M, Nascimento LC. A Inclusão da Criança com Síndrome de Down na Rede Regular de Ensino: Desafios e Possibilidades. *Rev Bras Ed Esp.* 2008;14(3):497-508.
4. Daunhauer LA, Fidler DJ, Will E. School function in students with Down syndrome. *Am J Occup Ther.* 2014;68:167-76.
5. Roberts LV, Richmond JL. Preschoolers with Down syndrome do not yet show the learning and memory impairments seen in adults with Down syndrome. *Dev Sci.* 2014;5. Doi: 10.1111/desc.12225. [Epub ahead of print].
6. Pelatti CY. Enhancing oral and written language for adolescents and young adults with Down syndrome. *Semin Speech Lang.* 2015;36(1):50-9.
7. Zampini L, D’Odorico L. Communicative gestures and vocabular development in 36-month-old children with Down’s syndrome. *Int J Lang Commun Disord.* 2009;44(6):1063-73.
8. Jarrold C, Thorn AS, Stephens E. The relationships among verbal short-term memory, phonological awareness, and new word learning: evidence from typical development and Down syndrome. *J Exp Child Psychol.* 2009;102(2):196-218.
9. Campbell C, Landry O, Russo N, Flores H, Jacques S, Burack JA. Cognitive flexibility among individuals with Down syndrome: assessing the influence of verbal and nonverbal abilities. *Am J Intellect Dev Disabil.* 2013;118(3):193-200.
10. Zampini L, D’Odorico L. Vocabulary development in children with Down syndrome: longitudinal and cross-sectional data. *J Intellect Dev Disabil.* 2013;38(4):310-7.
11. Yee-Pay W, Chwen-Tng S. Correlations of sensory processing and visual organization ability with participation in school-aged children with Down Syndrome. *Res Dev Dis.* 2011;32:2398-407.
12. Mengoni SE, Nash HM, Hulme C. Learning to read new words in individuals with Down syndrome: Testing the role of phonological knowledge. *Res Dev Dis.* 2014;35:1098-109.

13. Zampini L, Salvi A, D'Odorico L. Joint attention behaviours and vocabular development in children with Down syndrome. *J Intellect Disabil Res.* 2015;25. [Epub ahead of print].
14. Lalvani P. Mothers of children with Down syndrome: constructing the sociocultural meaning of disability. *Intellect Dev Disabil.* 2008;46(6):436-45.
15. Tsao R, Kindelberger C. Variability of cognitive development in children with Down syndrome: Relevance of good reasons for using the cluster procedure. *Res Dev Dis.* 2009;30:426-32.
16. Thurman AJ, Mervis CB. The regulatory function of social referencing in preschoolers with Down syndrome or Williams syndrome. *J Neurodev Disord.* 2013;5(1):2-20.
17. Grela BG. Lexical verb diversity in children with Down syndrome. *Clinical Linguistics & Phonetics.* 2002;16(4):251-63.
18. Galeote M, Soto P, Checa E, Gómez A, Lamela E. The acquisition of productive vocabulary in Spanish children with Down syndrome. *J Int Dev Dis.* 2008;3(4):292-302.
19. Stefanini S, Caselli MC, Volterra V. Spoken and gestual production in a naming task by young children with Down syndrome. *Brain Lang.* 2007;101(3):208-21.
20. Price JR, Roberts JE, Hennon EA, Berni MC, Anderson KL, Sideris J. Syntactic Complexity during conversation of boys with Fragile X Syndrome and Down Syndrome. *J of Speech, Lang and Hear Res.* 2008;51:3-15.
21. Crais ER, Watson LR, Baranek GT. Use of gesture development in profiling children's prelinguistic communication skills. *Am J of Speech-Lang Path.* 2009;18:95-108.
22. Martin GE, Losh M, Estigarribia B, Sideris J, Roberts J. Longitudinal profiles of expressive vocabulary, syntax and pragmatic language in boys with fragile X syndrome or Down syndrome. *Int J Lang Commun Disord.* 2013;48(4):432-43.
23. Maltesse A, Pepi A, Scifo L, Roccella M. Referential communication skills in children with Down Syndrome. *Minerva Pediatr.* 2014;66(1):7-16.
24. Polišenská K, Kapalková S. Language profiles in children with Down syndrome and children with language impairment: implications for early intervention. *Res Dev Disabil.* 2014;35(2):373-82.
25. Laws G, Briscoe J, Ang SY, Brown H, Hermena E, Kapikian A. Receptive vocabulary and semantic knowledge in children with SLI and children with Down syndrome. *Child Neuropsychol.* 2014;15:1-19.
26. Wright CA, Kaiser AP, Reikowsky DI, Roberts MY. Effects of a naturalistic sign intervention on expressive language of toddlers with Down syndrome. *J Speech Lang Hear Res.* 2013;56(3):994-1008.
27. Critério de Classificação Socioeconômica Brasil (CCSB). Associação Brasileira de Empresas de Pesquisa, 2011 [citado em 6 jun 2011]. Disponível em: [www.abed.org](http://www.abed.org).
28. Ferreira AT. Vocabulário receptivo e expressivo de crianças com síndrome de Down. [Dissertação] Bauru (SP): Faculdade de Odontologia de Bauru, Universidade de São Paulo; 2010.
29. Béfi-Lopes DM. Vocabulário (Parte B). In: Andrade CRF, Béfi-Lopes DM, Fernandes FDM, Wertzner HF. ABFW – Teste de linguagem infantil: nas áreas de fonologia, vocabulário, fluência e pragmática. Carapicuíba, São Paulo: Pró-Fono. 2000. p. 33-49.
30. Lent R. As portas da percepção: As bases neurais da percepção e da atenção. In: Lent R. Cem bilhões de neurônios: conceitos fundamentais de Neurociência. Atheneu. 2001. p. 555-86.

Received on: April 28, 2015

Accepted on: May 15, 2015

Mailing address:

Dionísia Aparecida Cusin Lamônica  
Al. Dr. Octávio Pinheiro Brisolla, 9-75  
Bauru – SP – Brasil  
CEP: 17012-901  
E-mail: [dionelam@uol.com.br](mailto:dionelam@uol.com.br)