

# Intervention in Syntactic Skills in Pupils with Developmental Language Disorder

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## Abstract

**Background:** The main objective of this research has been to verify the effectiveness of an intervention program on syntactic skills of pupils with typical development and with developmental language disorder. **Method:** A total of 99 five-year-old pupils from schools of Tenerife (Spain) participated. The CELF-4 Recalling Sentences, Formulated Sentences, and Sentence Structure subtests were used. The intervention program consisted of 40 sessions implemented by teachers and speech language therapists. Three levels of practice were organized: in the ordinary classroom (large group and small group) and in the support classroom. **Results:** Pupils diagnosed with developmental language disorder initially performed worse on syntax than those with typical development. In addition, the goodness of an intervention program was verified especially for Recalling sentences, and, to a lesser extent, for Sentences Structure, which improves in the experimental group with typical development as well as in the control and experimental groups with language development disorder. **Conclusions:** A collaborative and inclusive intervention program that uses implicit techniques favors the improvement of certain aspects of the syntactic processing of pupils with developmental language disorder. **Keywords:** Early intervention, developmental language disorder, program effects, inclusive classroom.

## Resumen

**Intervención en Habilidades Sintácticas en Alumnos con Trastorno del Desarrollo del Lenguaje. Antecedentes:** el objetivo principal de esta investigación ha sido verificar la efectividad de un programa de intervención sobre las habilidades sintácticas de los alumnos con desarrollo típico y con trastorno del desarrollo del lenguaje. **Método:** participaron 99 alumnos de cinco años de colegios de Tenerife (España). Se utilizaron los subtests del CELF-4 Recordando oraciones, Formulación de oraciones y Estructura de oraciones. El programa de intervención consistió en 40 sesiones implementadas por profesores y logopedas. Se organizaron tres niveles de práctica: en el aula ordinaria (grupo grande y grupo pequeño) y en el aula de apoyo. **Resultados:** los resultados indicaron que los alumnos diagnosticados con trastorno del desarrollo del lenguaje presentaron inicialmente un peor rendimiento en la sintaxis que aquellos con desarrollo típico. Además, se comprobó la bondad de un programa de intervención especialmente en Recordando oraciones, y en menor medida, para Estructura de oraciones, que mejora en el grupo experimental con desarrollo típico y en los grupos control y experimental con trastorno del desarrollo del lenguaje. **Conclusiones:** un programa de intervención de naturaleza colaborativa e inclusiva que recurre a técnicas implícitas favorece la mejora de determinados aspectos del procesamiento sintáctico de alumnado con trastorno del desarrollo del lenguaje. **Palabras clave:** intervención temprana, trastorno del desarrollo del lenguaje, efectos del programa, aula inclusiva.

Children with developmental language disorder (DLD) have receptive and expressive oral language difficulties. There is no obvious reason for these difficulties, which are likely to carry on into adulthood and have a significant impact on progress at school, and in everyday life. These children will always need support to be able to advance in their development and learning (Bishop et al., 2017).

The first difficulties of children with DLD are not syntactic, but a delay in their first words. Spanish-speaking children show lexical

limitations, as well as less variety in the use of verb forms and many difficulties in tasks where they are asked to link a word to a referent with little support (i.e.), link new words that have been learned with familiar or non-familiar referents (Andreu et al., 2013).

Syntactic deficits are among the features most frequently used in detection and diagnosis. In some cases, they are accompanied by lexico-semantic limitations, while in others, they present phonological (Leonard & Kueser, 2019), pragmatics, or discourse deficits (Bishop et al., 2017). When pupils with DLD are compared with their typically developing peers, they often show deficits in sentence production with extremely limited structural length, reduced complexity, and category errors, producing ungrammatical sentences, as well as errors in function words or morphological errors typically involving the omission or substitution of articles, clitic pronouns, prepositions, and link words (Del Valle et al., 2018; Ramírez et al., 2019).

Children with DLD first exhibit difficulties with the accurate use of syntactic structures in preschool, and these problems may continue throughout primary and secondary school. The consequences of syntactic deficits for a child's education can be very serious, because they show difficulties in order to increase the complexity of the linguist context, complex (which requires two or more sentences to be expressed) or narrative, both fundamental to school and social progress (Guo & Schneider, 2016). This is why the general view is that such problems should be identified and addressed as early as possible to prevent future complications. Early intervention to address language deficits in general, and syntactic deficits in particular, has a preventive effect on specific learning difficulties and also promotes self-esteem and social and emotional skills. The close relationship between syntactic and narrative skills and their connection to reading comprehension has been well studied. For example, it is difficult to produce coherent narratives without using the correct temporal connectors to signal the moment in which the events occur or the necessary pronominal references to give cohesion to a story and create links between the characters. Furthermore, these skills are essential for classroom interaction and social relationships (Norbury & Bishop, 2003).

Given these preliminary considerations, there is no doubt that it is important to ensure an effective intervention on the syntax of pupils with DLD. This is even truer considering the paucity of results of previous research in this area, quite unlike what has been observed for other components of language like speech and vocabulary (Smith et al., 2013b).

Generally speaking, two broad approaches have been described for organizing intervention programs on syntax: the implicit approach and the explicit approach (Ebbels, 2014). The former includes methods for grammatical facilitation based on repeated practice of circumstantial grammar objectives that can help students identify rules. These methods are generally used in preschool (ages 3-6) and the first years of primary school (ages 6-8). The most representative of these methods are imitation, modeling, focused stimulation, and recast, and they are often used in combination. Implicit methods have proven effective in improving expressive morphology and syntax in pupils with DLD, especially when the programs take the form of individual sessions run by speech language therapists or parents (Coloma et al., 2019; Ebbels, 2014). Explicit, or metalinguistic methods, explicitly teach syntactic forms and are almost always accompanied by specific visual aids. The best known are the Colorful Semantics method (Bryan, 1997), which involves reassembling sentences after cutting them up into their thematic roles and then color coding them, and Shape Coding (Ebbels, 2007), which uses shapes, colors, arrows, and lines to represent morphological properties and syntactic structures. Studies of these metalinguistic approaches have shown that they can be effective for pupils with DLD in the later years of primary school (ages 9-12) and secondary school (ages 12-16), but their effectiveness has only been proven when they are implemented individually by speech language therapists (Ebbels et al., 2013). On the one hand, different studies have successfully used an explicit methodology to achieve morphosyntactic aims like the improvement on expressive argument structure (Ebbels et al., 2007), expression and comprehension of passive sentences (Riches, 2013), and comprehension of coordinating conjunctions (Ebbels et al., 2013). On the other hand, some research has shown efficacy using an implicit methodology, for example, it benefits expressive grammar (Cleave et al., 2015; Curran & Owen, 2019;

Gillam et al., 2012), and subject pronouns he and she, possessive -s, past tense -ed (Smith et al., 2013a).

Quite beyond the discussion about the strengths and weaknesses of each method, there seems to be widespread agreement amongst researchers and professionals about the importance of starting syntactic intervention at the right age. Everything seems to indicate that the most positive effects are achieved with pupils between four and eight years old. It has even been stated that from nine years of age, the objective is usually to minimize the impact of the syntactic deficit on the disorder, instead of achieving real progress in syntactic complexity. From this last observation it could be inferred that implicit models are more appropriate for early intervention (Fey & Proctor-Williams, 2000).

Finally, some research has carried out language intervention from a system with various levels of support, often called Response to Intervention Model (RTI). So, when teachers apply effective instructional practices, the majority of pupils will make the most of it, whereas some other pupils require additional tiers of support. There are three tiers of support. The tier 1 (T1) or support for all pupils; the tier 2 (T2) small group support; and tier 3 (T3) or individualized support. Some studies have dealt with whether the RTI approach can improve the language of pupils with language difficulties in preschool (Greenwood et al., 2019; McConnell et al., 2015).

According to the previous reflection, it is furthermore understood that an implicit approach due to its flexible and interactive nature could be much better adapted to an organization under a Response to Intervention Model (RTI) (Stanton-Chapman et al., 2016).

Given the above, it has been deemed appropriate to design the current research to study the effects of an intervention program on syntactic skills using implicit methods in a group of five-year-old pupils diagnosed with DLD and enrolled in preschool. For this purpose, the following hypotheses were developed:

Hypothesis 1: pupils with DLD will be worse in syntactic skills than the children with typical development.

Hypothesis 2: pupils who receive the intervention program will show greater gains in syntactic skills than children who do not receive the intervention program.

## Method

### Participants

In this study, 99 children participated, all of whom were enrolled in 54 schools in the island of Tenerife (Canary Islands, Spain). They were divided into four groups: (1) a control group of children with developmental language disorder (CD); (2) a typical development control group (CT); (3) an experimental group of children with developmental language disorder (ED) and (4) a typical development experimental group (ET).

Table 1 shows the descriptive statistics of each group in the Age and non-verbal IQ variables. Both were used to equalize the groups. Normality of age was confirmed ( $z = .08$ ;  $df = 99$ ;  $p = .174$ ). To verify that the groups were matched on this variable, an ANOVA was performed ( $F(3,95) = 3.0$ ;  $p = .520$ ;  $\eta^2 = .01$ ). The K-BIT intelligence test was used to evaluate non-verbal IQ (Kaufman & Kaufman, 2000). Normality of IQ was confirmed ( $z = .10$ ;  $df = 99$ ;  $p = .098$ ). To verify that the groups were matched on this variable, an ANOVA was performed ( $F(3,95) = 5.1$ ;  $p = .097$ ;  $\eta^2 = .04$ ).

Table 1  
Descriptive statistics of the groups in age and non-verbal IQ

Study Groups	n	Gender		Age				Non-verbal IQ			
		Male	Female	Min	Max	M	SD	Min	Max	M	SD
CD	25	14	11	5.2	6.3	5.6	0.3	80	106	96	7
CT	25	14	11	5.2	6.3	5.7	0.3	89	113	111	6
ED	25	15	10	5.3	6.2	5.7	0.3	80	106	98	8
ET	24	15	9	5.2	6.3	5.8	0.3	80	120	107	8

Note: CD = Control Group DLD. CT = Control Group TD. ED = Experimental Group DLD. ET = Experimental Group TD

Two of the groups were selected by convenience sampling (CD and ED), given that the students were required to meet specific selection criteria. To select the pupils of the DLD groups, an initial screening was carried out in all the schools of the island of Tenerife, in collaboration with school administrators and educational and psychopedagogical guidance counsellors. These counsellors were asked to refer all students showing possible signs of DLD—that is, problems with comprehension or expression in one or more components of language, but especially in morphosyntax and semantics—or students with several years' history of unresolved language difficulties. A total of 147 pupils were referred in this way, all of whom were put through an exhaustive comprehensive language assessment to confirm the diagnosis, using a standardized test, the CELF-4 (Semel et al., 2006). This administration of the evaluation protocol led to the selection of a sample of 50 students with a diagnosis of DLD, who were randomly assigned to one of the two equivalent groups of the study, keeping gender balanced in the equivalent groups. A total of 65 pupils were excluded from the study for presenting phonological delay characterized by simplification process typical of younger children, and 32 children were excluded for not completing the tests, due to repeated absences or lack of collaboration.

The pupils of the groups with typical development were selected by means of discretionary sampling to ensure the four groups were as similar as possible in other variables that could influence the results. A total of 50 students with typical development were selected from among the classmates of the children with DLD. The pupils in this group did not have any language difficulties and were being schooled within the usual parameters. One pupil was excluded for not completing the tests, due to repeated absences. The final sample therefore consisted of 99 students from different social backgrounds, from both public and private schools as well as rural and urban areas.

### Instrument

CELF-4 standardized test (Semel et al., 2006). This is a language assessment test with scales for Spanish speakers in the United States. It evaluates the processes of language comprehension and expression in general, by means of tasks involving the structuring and formulation of sentences, concepts and directions, structure and kinds of words, and recalling sentences. The average reliability coefficients for the CELF-4 Spanish index scores range from .90 to .96. The structure of the test was validated by several confirmatory analyses (by age group) to check the hierarchical structure of the model. All showed an appropriate goodness of fit.

The dependent variables were *Recalling Sentences* ( $\alpha = 0.96$ ), *Formulated Sentences* ( $\alpha = 0.46$ ) and *Sentence Structure* ( $\alpha = 0.31$ ), the three syntax subtests of CELF-4 (Semel et al., 2006). The *Recalling Sentences* subtest consists of having the child repeat a series of sentences of increasing difficulty. The *Formulated Sentences* subtest asks the child to formulate a sentence from a word, with the help of a flashcard. Finally, the aim of the *Sentence Structure* subtest is to evaluate the pupil's ability to interpret spoken sentences of increasing length and complexity and select the pictures that illustrate referential meaning of the sentences.

Matrix subtest of K-BIT test (Kaufman & Kaufman, 2000) was used to assess non-verbal intelligence. This test evaluates the ability to solve reasoning problems through both figurative and abstract visual stimuli.

### Procedure

The intervention program was implemented by 45 preschool teachers and 30 speech language therapists (SLT), who were provided with 20 hours of prior training. They were given a detailed folder with all the necessary materials and were also trained in a practical workshop session. Throughout the intervention, they received weekly visits from members of our research team during which possible concerns were addressed and explicit classroom support was provided. There were four additional group meetings held over the course of the intervention to ensure that it was running as planned.

The program lasted 12 weeks and the posttest evaluation was carried out in the two weeks following the intervention. A total of 40 daily implicit approach sessions were held, lasting 15 minutes each (Plante et al., 2019), all following the same sequence and using the same materials. These sessions were organized following the Response to Intervention Model (RTI), which are frequent throughout the public school system. Its implementation requires the use of a multitiered system of intervention (Hall-Mills, 2019). On the first four days of the week, each teacher worked within the ordinary classroom context, combining situations involving all pupils (Tier 1) and small groups (Tier 2); on Fridays, the pupils with DLD and those with typical development of the experimental group would go to another classroom outside the ordinary one to work with the SLT (Tier 3) and reinforce the program activities.

Five specific techniques were employed. The first, recast or reformulation, allowed the professional to respond to the child's immature or incorrect expressions with a recast containing a restructured grammatical form. For example, if the child said: "Fat elephant eats flower", the professional replied: "A very fat elephant eats a flower". With the second technique, extension, information

was added to the child’s statement. For example, if the child said: “A very fat elephant eats a flower”, the professional could add: “A very fat elephant eats a flower *because it is hungry*”. The third technique was vertical structuring, where the professional produced the complete statement for the child. For example, if the child said: “A very fat elephant. He was very hungry”, the professional might reply: “A very fat elephant *who* was very hungry”. In the fourth place was concatenation, in which the professional would ask questions to complete parts of the statement, then produce the complete statement for the child. For example, the professional would say: “Tell me, who do you see in this picture?” and the pupil would reply “An elephant”, to which the professional would respond: “And what is it doing?”. The answer might be “Eating a flower”. The professional would say: “Let’s say it all together, and the pupil would say: “A very fat elephant is eating a flower”. Finally, there is imitation, where the correct model is presented to the pupil for repetition.

In the ordinary classroom, work would start with a series of activities as described in Table 2. All activities were organized with the full group, except “Identifying whether they mean the same thing”, which was done in groups of two to five pupils.

Finally, the sessions with the SLT reviewed all of the prior work done in the ordinary classroom. Prior authorization was requested from educational centers and families. Compliance with ethical standards was also positively assessed by the Institutional Review Board.

#### Data analysis

In the first place, to test hypothesis 1, a univariate ANOVA for each dependent variable studied (syntax subtests of CELF-4) was carried out with the pretest scores, which enabled us to test the initial differences between the groups and thus establish the baseline. Finally, to test the second hypothesis, a variable was

Table 2  
Format of syntactic activities

Activity	Description and examples
Progressive drawing of a picture	The process of building a story, through pictures, and asking what the character is like, where and when an action occurs, etc., promotes production of more complex morphosyntax. P (Professional): What is this? (Child) C: An elephant. P: What is the elephant like? C: Very fat. P: Let’s say it together (showing the pictures) C: A very fat elephant. P: What is the very fat elephant doing? C: Eating a flower. P: Now all together. A very fat elephant is eating a flower. When is it doing it? C: At night. P: Again, everything we’ve said ... (Pointing to the different parts of the picture in order: elephant, flower, moon...) C: A very fat elephant is eating a flower at night. P: Now a different way (pointing at the pictures in the order moon-elephant-flower) C: At night, a very fat elephant is eating a flower. P: Where is the elephant eating the flower? C: Under the palm tree C: At night, an elephant is eating a flower under the palm tree... or C: Under the palm tree, at night, an elephant is eating a flower... or C: Under the palm tree, an elephant is eating a flower at night.
Following orders: Simon says ...	Unless Simon says get up <i>unless</i> you have long hair But Simon says pick up some paint, <i>but</i> not the red one Neither Simon says look <i>neither</i> at the door <i>nor</i> at the window Or Simon says cross your arms <i>or</i> put your hands in your pockets First Simon says sit down and <i>first</i> pick up some paint Except Simon says sing <i>except</i> when I have my hand in my pocket Although Simon says talk, <i>although</i> I have my back turned Some Simon says take a pencil from <i>some</i> classmate Beside Simon says sit <i>beside</i> the classroom door Before Simon says <i>before</i> getting up, draw a cross on the chalkboard After Simon says raise your right hand <i>after</i> getting up
Finishing sentences	Finish incomplete sentences with a word. For example, My father used to go there walk; They were speaking quietly they though the baby was sleeping, etc.
Syntax exercises	The aim is to detect the errors. A puppet who makes mistakes when speaking is used, and the pupil has to correct them. For example, “He misbehaved so he had to stay recess”.
Ordering sentences	likes / apple / Juan / juice
Identifying whether they mean the same thing	The cat is on the balcony – On the balcony is the cat I want a sandwich and a drink – I want a drink and a sandwich The soldiers joined with the Indians to attack the thieves – The soldiers were attacked by the Indians and the thieves

generated for each subtest, calculated on the gain produced after the intervention (gain = post – pre). A univariate ANOVA was performed for each dependent variable studied to determine if there were differential gains after the intervention. As a preliminary step to all ANOVAs performed, the homogeneity of the variances was determined using Levene’s test. In the contrasts that presented heterogeneity, the robust Welch’s test was used. Orthogonal contrasts were performed as *post-hoc* comparisons in those evaluations that showed significant differences, to identify which groups showed differences. The use of orthogonal contrasts as a *post-hoc* ANOVA test offers greater flexibility than the tests of mean differences. It allows for comparisons between individual means or between groups of means. In addition, it allows for total control in the estimation of errors  $\alpha$  and  $\beta$  (Montgomery, 2017). A  $\eta^2$  generalized was used as an indicator of effect size for the effects of ANOVAs. A  $\eta^2$  around .01 is generally considered to be of little effect, a square eta around .06 indicates a medium effect, and a square eta greater than .14 is already a large effect. A value of  $p \leq .05$  was considered statistically significant. All analyses were carried out with the program SPSS v25.

Results

The descriptive statistics are shown numerically for the four groups before and after the intervention program, as well as the gains obtained after the intervention program in each syntax subtest of the CELF-4 tested: *Recalling Sentences*, *Formulated Sentences* and *Sentence Structure* (Table 3).

A univariate ANOVA was first performed with the results obtained in each subtest of CELF-4 syntax before the start of the intervention program. Table 4 shows the results obtained. As can be seen, the results showed significant differences in all subtests, with a large effect size. In addition, it can be seen that the two groups of children with DLD showed significantly lower results than the groups of children with TD, while the equivalent groups showed no differences between them.

To test the second hypothesis, an ANOVA was performed on the gains of the groups in each syntax subtest of the CELF-4 (posttest scores – pretest scores). Table 5 shows the ANOVA on gains for each syntax subtest. As can be seen, the main effect only showed significant differences in *Recalling Sentences* and in *Sentence Structure*, with a large effect size.

In the *Recalling Sentences* subtest, both experimental groups showed higher gains than the two control groups after receiving the intervention program, with a medium effect size. On the other hand, in the *Sentence Structure* subtest, the control group with TD showed significantly less gain than the other three groups, with a large effect size comparing to the experimental group with ED but an average effect size comparing to the other two groups. However, the three groups did not show difference between them.

Discussion

There are many studies that consider the acquisition of syntax to be at the heart of the problems affecting pupils with DLD. Indeed, it is common to observe a significant limitation in the structural length

*Table 3*  
Descriptives for measures and Gains after treatment (post – pre) in each syntax subtest

Subtest	CD			CT			ED			ET		
	Pre	Post	Gain	Pre	Post	Gain	Pre	Post	Gain	Pre	Post	Gain
	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)
RS	7.9 (7.7)	14.4 (13.3)	6.5 (7.6)	55.0 (15.1)	59.2 (20.8)	4.2 (14.7)	7.4 (7.3)	20.6 (12.0)	13.2 (8.9)	46.4 (15.3)	58.6 (15.5)	12.2 (12.2)
FS	0.6 (1.6)	3.8 (4.7)	3.2 (4.7)	20.0 (10.6)	20.9 (10.0)	0.9 (11.0)	2.1 (3.2)	6.0 (9.6)	3.9 (5.9)	15.8 (9.4)	20.3 (9.6)	4.5 (10.3)
SS	13.3 (3.0)	16.3 (4.1)	3.0 (4.0)	25.2 (3.7)	25.5 (2.9)	0.3 (3.9)	14.2 (3.5)	18.4 (3.6)	4.2 (4.1)	24.0 (3.8)	26.9 (2.5)	2.9 (3.9)

*Note:* CD = Control Group DLD. CT = Control Group TD. ED = Experimental Group DLD. ET = Experimental Group TD. RS = Recalling Sentences. FS = Formulated Sentences. SS = Sentence Structure

*Table 4*  
ANOVAs for pre and Orthogonal contrasts in each syntax subtest

Subtest	F (3,95)	$\eta^2$	Orthogonal contrasts (1,95)											
			CD vs CT		CD vs ED		CD vs ET		CT vs ED		CT vs ET		ED vs ET	
			F	$\eta^2$	F	$\eta^2$	F	$\eta^2$	F	$\eta^2$	F	$\eta^2$	F	$\eta^2$
RS	<sup>(a)</sup> 106.5***	.77	193.1***	.67	0.0	.00	128.8***	.58	197.1***	.67	6.5	.06	132.0***	.58
FS	<sup>(a)</sup> 44.1***	.58	87.7***	.48	0.5	.01	53.3***	.36	75.2***	.44	4.3	.04	43.6***	.31
SS	81.6***	.72	147.0***	.61	1.0	.01	118.1***	.55	124.3***	.56	1.6	.02	97.9***	.50

*Note:* CD = Control Group DLD. CT = Control Group TD. ED = Experimental Group DLD. ET = Experimental Group TD. RS = Recalling Sentences. FS = Formulated Sentences. SS = Sentence Structure. <sup>(a)</sup> = Welch’s F. \*\*\*  $p \leq 001$



Table 5  
ANOVAs for gains after treatment and Orthogonal contrasts in each syntax subtest

Subtest	F (3,95)	$\eta^2$	Orthogonal contrasts (1,95)											
			CD vs CT		CD vs ED		CD vs ET		CT vs ED		CT vs ET		ED vs ET	
			F	$\eta^2$	F	$\eta^2$	F	$\eta^2$	F	$\eta^2$	F	$\eta^2$	F	$\eta^2$
RS	<sup>(a)</sup> 4.2**	.11	0.5	.01	4.5*	.05	3.3*	.04	8.2**	.09	6.5*	.06	0.1	.01
FS	<sup>(a)</sup> 0.6	.03	–	–	–	–	–	–	–	–	–	–	–	–
SS	4.5**	.12	6.3*	.06	1.1	.01	0.1	.00	12.6***	.12	5.8*	.06	1.3	.01

Note: CD = Control Group DLD. CT = Control Group TD. ED = Experimental Group DLD. ET = Experimental Group TD. RS = Recalling Sentences. FS = Formulated Sentences. SS = Sentence Structure. <sup>(a)</sup> = Welch's F. \* $p \leq 05$ . \*\* $p \leq 01$ . \*\*\* $p \leq 001$

of the sentences produced, as well as the presence of frequent errors that demonstrate these individuals' enormous difficulties in the use of syntactic structures (Leonard & Kueser, 2019). In the present study, when participants with DLD were compared with those with typical development, syntactic impairments were evident. These results confirm the first of our hypotheses and are supported by those obtained in previous research, such as the studies carried out by Ebbels et al. (2007), Arndt and Schuele (2012), Guo and Schneider (2016), Leonard et al. (2017), and Guo et al. (2019).

Many authors believe that it is imperative to offer early and effective language intervention with the aim of remedying one of the central problems in pupils with DLD: their considerable syntactic difficulties. However, many of the treatment methods used are inadequate, since they only produce moderately significant gains after long periods of intervention. There is much discussion about the use of explicit versus implicit methodology to get some morphosyntactic aims. Some research questions the efficacy of the implicit method when learning the expressive and receptive grammar (Conti-Ramsden et al., 2015), recommending the explicit method instead (Luckács et al., 2017). In our case, an implicit methodology has been chosen that considerably increases the number of exposures to the target syntactic forms through modeling, imitation, and recast, as Ebbels (2014) opportunely suggests. There are many studies indicating that such approaches facilitate grammatical learning in young children with DLD at ages similar to those of the subjects of the present investigation (Ebbels, 2014; Fey et al., 1993; Plante et al., 2014). Fey et al. (1993) verified the efficacy of an intervention program carried out by parents and speech and language therapists using an implicit methodology to encourage the grammatical development in children with language impairment. The same approach was used successfully in other studies, such as Gillam et al. (2012), Cleave et al. (2015), and Curran and Owen (2019).

Another reason to support implicit methodology is that it is easier to use in the normal classroom and with the group activities, causing that the learned forms can be used for communicative purposes, both by the pupils of the group with DLD and by the group with typical development; meanwhile the explicit methodology is focus on a clinic intervention, that is to say, one-to-one. Finally, teachers training for intervention program with implicit methodology is less complex because it must be focused on maintaining interaction, on offering expanded and improved linguistic feedback, and on increasing the frequency of intervention objectives. This idea is corroborated by Fey et al. (1993) who trained parents and obtained very favorable results in morphosyntactic production.

In our results, it can be seen as the second hypothesis was partially demonstrated, since the improvement after the intervention was greater in the experimental groups (Experimental Group DLD and Experimental Group TD) compared to the controls in the Recalling Sentences subtest, while no differences were observed in the Sentence Structure subtest between the experimental groups and the control group with DLD. However, a greater gain in recalling sentences is key, since immediate recall is closely related to verbal working memory, one of the clinical markers usually connected with this type of disorder and co-responsible for most syntactic alterations. This probably leads to a greater ability to internalize the fundamental structural features (subordination, verbal inflections, use of functional vocabulary, etc.). Likewise, this ability is closely linked to classroom activities, especially following the teacher's instructions, learning vocabulary, taking notes, and acquiring other curricular content.

Regarding the improvement in Sentence Structure, this is also important as a fundamental ability for understanding spoken language, describing events, and generating stories stimulated by complex production contexts such as narrative discourse. Probably a greater use of techniques such as focused stimulation and recast offer DLD pupils online help in the understand and use of forms of language that have not yet been acquired, as suggested by Fey et al. (1993). Finally, the finding that the greater gains in this ability also included the control group with DLD could be explained by the fact that, despite not receiving our intervention program, this group maintained its usual work with the SLTs in their respective schools.

There is no effectiveness in the intervention program in Formulated Sentences that translates into no gains. This circumstance should be explained by the difficulties that pupils with DLD have in acquiring the lexicon, both content and functional, and by their habitual problems of access to the lexicon. In this context, automatic access to lexical items, the content lexicon (nouns, verbs and adjectives) is impeded, hindering the formation of the predicate and the arguments of the proposition. Levelt model (Levelt, 1989) has been commonly used to explain the difficulties of syntactic production of pupils with DLD.

As Finestack and Satterlung (2018) remind, there is few evidence supporting the use of explicit approaches over implicit approaches. Therefore, studying the use of implicit strategies can be a fruitful area of research for researchers in grammatical interventions in pupils with DLD and typical development. In addition, empirical studies on syntactic intervention in Spanish-speaking pupils with DLD are really scarce, so this research tries to be a contribution

to encourage research in this field. Furthermore, the proposal highlights collaboration between teachers and speech language therapists and it presents a model that is largely applicable in the context of the normal classroom (inclusive approach). Planning is based not so much on the deficits of the pupils, but on their linguistic needs, offering them multiple levels of support, in tune with the RTI models. Moreover, if all this is proposed at an early age, some of the fundamental pillars for the learning and academic progress of pupils with DLD will be being placed. Language intervention can be effectively embedded into normal classroom teaching, the authentic context for intervention (Curran & Owen, 2019).

Some limitations of the present study should be considered. The sample sizes of the groups of children were small, so group comparisons could not easily reach significance. Interpretations of group differences should be made with caution. It would have been desirable to measure the dosage or teaching episodes per session, for example the number of times the recast is used. It could also

be fruitful for further investigations to verify the generalization of syntactic learning in children's spontaneous communication, as well as to analyze the type of sentences and go deeper into significant differences between children.

The results of this study suggest that teachers and speech language therapists can organize a more collaborative and inclusive syntactic intervention in more natural contexts, responding to the needs of all the pupils.

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