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Use of Oral Narrative and Morphosyntactic Activities to Improve Grammar Skills in Pupils with Specific Language Impairment (SLI)☆

Gustavo M. Ramírez-Santana, Víctor M. Acosta-Rodríguez*, Ana M. Moreno-Santana, Nayarit del Valle-Hernández, and Ángeles Axpe-Caballero

Universidad de La Laguna, Santa Cruz de Tenerife, Islas Canarias, Spain

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ABSTRACT

In this research, it is presented an intervention program that combines storytelling with morphosyntactic activities to improve grammatical skills in pupils with Specific Language Impairment (SLI). The sample consisted of a total of 34 pupils diagnosed with SLI and 34 children with typical language development. For the selection of the sample, the CELF-3 test, the Peabody test, the Hearing Association and Visual Association subtests of the ITPA and the K-BIT Intelligence test were used. The intervention program consisted of 216 sessions of 40 minutes each, in which oral narrative activities were combined with other activities related to the automation of morphosyntactic skills. Significant gains were also made in the group of children with SLI versus controls in total ungrammaticality, ungrammatical sentences, morphological and syntactical errors. In conclusion, a combined program of both storytelling and morphosyntactic skills improves grammatical achievement in pupils with SLI.

El uso combinado de narraciones orales y actividades morfosintácticas para mejorar habilidades gramaticales de alumnado con trastorno específico del lenguaje (TEL)

Palabras clave:
Intervención
Narrativa
Trastorno específico del lenguaje
Agramaticalidad

RESUMEN

El objetivo de este trabajo es estudiar los efectos de un programa de intervención diseñado para mejorar habilidades gramaticales en alumnado con trastorno específico del lenguaje (TEL). La muestra la conforma un grupo de 34 alumnos diagnosticados con TEL y 34 niños con desarrollo típico. Para su selección se utiliza el test CELF-3, el test Peabody, los subtests de Asociación Auditiva y Asociación Visual del ITPA y el test de Inteligencia K-BIT. El programa de intervención se lleva a cabo a lo largo de 216 sesiones de 40 minutos de duración cada una, combinando actividades de narraciones orales con otras relacionadas con la automatización de habilidades morfosintácticas. Los resultados indican mejoras significativas en el grupo de alumnado con TEL en comparación con los controles en términos de reducción de oraciones agramaticales y de errores sintácticos y morfológicos. En conclusión, un programa combinado de estimulación de habilidades narrativas y morfosintácticas mejora el rendimiento gramatical del alumnado con TEL.

Introduction

Children with Specific Language Impairment (SLI) are characterized by a primary disorder in language learning not accompanied by neurological, cognitive or sensory deficits (Leonard, 2014). Although they show typical difficulties in various language areas, it is their grammar skills which are particularly affected. These deficits take the form of limitations in the production and

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* Corresponding author.
E-mail address: vacosta@ull.edu.es (V.M. Acosta-Rodríguez).

understanding of complex sentences and utterances marked by ungrammaticality (Anderson, 2007). While most of the research on this topic comes from work done with English-speaking children, in recent years researchers have increasingly shown interest in studying this phenomenon in speakers of other languages, such as Spanish. Indeed, such papers have documented problems in the production of articles and clitic pronouns and with the use of verbal inflections (Bosch & Serra, 1997; Coloma, Araya, Quesada, Pavez, & Maggiolo, 2016; Grinstead et al., 2013; Gutiérrez-Clellen, Restrepo, & Simon-Cereijido, 2006).

Given the above considerations, it is clear that therapy for children with SLI must focus on deficits in the grammatical system. However, problems have been observed in the results obtained from such treatments, largely due to the great divergence in study design. For example, grammatical intervention objectives have been included in general language stimulation programs as opposed to other, more specific programs: in other cases, more attention has been given to production that to comprehension, or greater emphasis placed on treating younger children over older children and adolescents (Hadley, 2014); and finally, there has been huge diversity in the ways therapies are organized (professionals vs parents, one-on-one vs group) and in the intervention approaches used, which might be implicit, explicit, or a combination of the two (Ebbels, 2008).

With respect to this last point, recent work by Ebbels (2014) and Mendoza (2016) offers a review of the different approaches used in grammar intervention. These authors explain that implicit approaches use methods that attempt to facilitate the acquisition of the grammatical forms usually omitted by children aged 4–12. The most common procedures used here are imitation training, modeling or focused stimulation, and recasting. Explicit approaches are directed at teaching grammar rules, often using visual cues. Among these approaches we find color keys and the combination of shapes, colors, and arrows to indicate different parts of the morphology and syntax. Finally, combined approaches have focused on meeting grammar objectives through the use of oral narratives and morphosyntactic activities (Proctor-Williams, 2014; Swanson, Fey, Mills, & Hood, 2005).

It is in this latter context – the approach that combines oral narratives and morphosyntactic activities – that the present research should be placed. The overall objective is to improve grammar production and consequently reduce ungrammaticality in children diagnosed with SLI. In particular, and with respect to the different phases of the intervention program, the specific objectives of the present study are as follows: first, to reduce total ungrammaticality in children with SLI; second, to limit the production of ungrammatical sentences; and finally, to reduce the production of grammatical errors, both morphological and syntactic.

Method

Participants

The sample consisted of 68 primary school children, divided into two groups, experimental and control. The experimental or SLI group (SG) consisted of 34 children (*mean age* = 8.0 years, *range* = 5.7–11.5, *SD* = 1.6). The control group (CG) consisted of 34 children with typical language development. To make up the control group, children were chosen from among the classmates of the children with SLI in order to homogenize the sample as much as possible by eliminating variables such as the school context, teacher, methodology or peer group. The control group pupils had no language problems and followed schooling within the usual parameters (*mean age* = 7.95 years, *range* = 5.7–11.4, *SD* = 1.6). The 68 pupils were recruited from 19 schools, including both public schools (approximately 70% of the total, with a medium-low to medium social profile) and charter (subsidized) schools (approximately 30% of the total, with a medium social profile); in both cases, the sample included both rural and urban schools.

Instruments

For the sample selection, we applied certain exclusion criteria related to SLI present in the literature. Namely, the pupils' school histories were examined to ensure no major problems existed, especially with respect to their hearing and orofacial motor skills. Then, the three tests set forth below were administered.

CELF-3 (Semel, Wiig, & Secord, 2003): The CELF is the test most commonly used internationally for the study of this disorder, and version 3 is the one that was available when the present study was begun. This is a standardized language test with scales for Spanish speakers in the United States, with Cronbach's alpha between .74 and .91. 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 remembering sentences.

Peabody (Dunn, Dunn, & Arribas, 2006): This test focuses on vocabulary and can be administered between 2.6 and 16 years of age, with a reliability of $\alpha = .93$. The child must choose from among four images the one corresponding to the word given by the evaluator and the vocabulary used consists of names of objects, situations, professions and animals, actions and attributes.

ITPA (Kirk, McCarthy, & Kirk, 2005): From this test, we administered the Visual and Hearing Association subtest (Cronbach's alpha between .75 and .91) to check the degree of knowledge of conceptual relationships (semantic psycholinguistic processes).

K-BIT (Kaufman & Kaufman, 2000): This test was chosen because it uses the non-verbal forms ($\alpha = .98$).

The results of the entire evaluation process for both groups are set out in Table 1. Reliability and validity of the scales were calculated using the coefficients for internal consistency (Cronbach's α), compound reliability (McDonald's ω), and convergent validity, which was measured using average variance extracted (AVE). Optimal results were obtained in all three indices for the CELF Expressive and Receptive subtests, the Peabody test, and the non-verbal IQ (K-BIT) test. The Hearing Association and Visual Association subtests of the ITPA obtained lower results for the coefficients of internal consistency, compound reliability, and convergent validity, although they were within the appropriate range.

Procedure

Sample selection and evaluation

An initial screening was carried out in all of the schools of the island of Tenerife, with the help of the schools' educational and psychopedagogical staff, who were asked to refer all students with possible signs of SLI, that is to say, those who showed problems with language comprehension and/or expression. A total of 65 pupils were referred in this way. To confirm the diagnosis, these pupils were subjected to the tests described above; 31 pupils were not included in the final sample as they exhibited problems related to articulation only, with no morphosyntactic or lexico-semantic components. The results of the CELF-3 are crucial for SLI diagnosis, and the pupils in the experimental group obtained mean scores below −1.25 for language capacity, as required by important authors such as Leonard (2014). The results obtained in the Peabody and ITPA in the SLI group were below the chronological age. The results of the K-BIT showed that the children with SLI had a non-verbal IQ equal to or higher than 85. Once the SLI group was identified, the pupils' parents/legal guardians were contacted to obtain informed written consent for their child's participation in

Table 1
Results and reliability indices of the diagnostic evaluation tests

Tests	SG (n = 34)		CG (n = 34)		Internal consistency	Compound reliability	Convergent validity
	M	*SD*	*M*	*SD*	Cronbach's α	McDonald's ω	AVE
CELF Expressive. *SD*	−1.4	.9	1.5	.9	.919	.957	.88
CELF Receptive. *SD*	−1.2	.6	1.1	.7	.860	.946	.79
PEABODY. *SD*	−1.5	1.2	.3	.9	.905	.945	.85
ITPA. Hearing A. PA	3.9	2.3	7.7	2.0	.699	.854	.81
ITPA. Visual A. PA	5.4	2.3	6.6	1.7	.703	.830	.66
K-BIT. Non-verbal IQ	102.2	9.0	114.9	12.3	.931	.976	.91

Note. AVE: average variance extracted, CG: control group, *M*: mean, PA: psycholinguistic age, *SD*: standard deviation, SG: pupils with SLI.

the study. Also, approval for the study was obtained from the University of La Laguna's Ethics Committee for Research and Animal Welfare.

Grammatical measures

The language samples were obtained through the task of retelling the story *Frog, where are you?* (Mayer, 1969). The speech/language therapist told the story to the child, then asked them to retell it with the help of sheets. The child's retelling was recorded on a digital audio track. Subsequently, the recording was transcribed and the sentences categorized following the SALT method (Miller, Andriacchi, & Nockerts, 2012). Then the corpus was segmented into units of analysis consisting of simple sentences and complex sentence structures or T-units. Simple sentences structures are sequences that have one verbal predicate (or one clause) or one nominal predicate and are syntactically independent. Complex sentence structures are units composed of multiple clauses. We used the T-unit as defined by Hunt (1965) to determine the subordination of the clauses. Thus, a T-unit is made up of the main dominant clause and all its subordinate clauses and modifiers.

Once the corpus had been segmented into sentences, the ungrammatical sentences and those that contained grammatical errors were identified. Ungrammatical sentences are defined as structures that are imprecise, ambiguous, incoherent, and contain various grammatical errors that impede comprehension of the meaning (e.g., that do not permit the identification of the agent or the consequences of the action). Sentences that contain grammatical errors, in turn, are defined as sentences that contain elements that violate morphological and/or syntactic structures (but not phonological errors), without altering the structure or impeding access to the meaning. This latter category tends to be divided into errors of omission, substitution, or addition, which in turn, using the categories proposed by Jackson-Maldonado, Bárcenas, and Alarcón (2013) and in particular Bosch and Serra (1997), are split into two main categories: morphological errors and syntactic errors.

Morphological errors can involve errors in the agreement between the determiner and the noun syntagma (e.g., *La (el) perro salió corriendo* [The dog ran off], feminine determiner used with masculine noun); subject-verb agreement (e.g., *Lucas y el perro corrió (corrieron) por el bosque* [Lucas and the dog ran through the forest], plural subject used with singular verb form); and agreement between verb form and tense (e.g., *Lucas fue al bosque para buscó (buscar) a la rana* [Lucas went to the forest to looked for the frog], simple past verb form used instead of infinitive); syntactic errors, in turn, are generally classified as either omissions, substitutions, or additions. Omissions include those that affect the verb (e.g., *La rana Ø (fue) al bosque* [The frog Ø (went) to the forest]), the auxiliary verb (e.g., *El perro Ø (estaba) ladrando a un panal de abejas* [The dog Ø (was) barking at a beehive]), the determiner (e.g., *Lucas y Ø (el) perro están durmiendo* [Lucas and Ø (the) dog are sleeping]), the clitic pronoun (e.g., *Lucas miró en el agujero. Salió un topo y Ø (lo) mordió* [Lucas looked in the hole. A mole came out and bit Ø (him)]), the adverb (e.g., *El niño miró Ø (detrás) el tronco* [The boy looked Ø (behind) the tree trunk]), a function word such as a conjunction (e.g., *El niño se agarró de las ramas Ø (pero) no eran ramas* [The boy grabbed the branches Ø (but) they weren't branches]) or preposition (e.g., *Ellos la buscaron Ø (en) el tronco* [They looked for it Ø (in) the tree trunk]).

The most significant substitutions affect the nominal form (e.g., *Lucas se durmió con el perro. Por la mañana Juan no la vió* [Lucas fell asleep with the dog. In the morning Juan didn't see it]), the adverb (e.g., *Lucas miró en el agujero después (mientras) el perro estaba ladrando* [Lucas looked in the hole after (while) the dog was barking]), a function word such as a conjunction (e.g., *El niño se agarró de las ramas y (pero) no eran ramas* [The boy grabbed the branches and (but) they weren't branches]) or preposition (e.g., *Ellos la buscaron por (detrás) del tronco* [They looked for it by (behind) the tree trunk]). Finally, the most frequent additions are of the pronoun (e.g., *El niño la encontró él* [The boy he found it]), the adverb (e.g., *Cuando el perro se cayó y Lucas se enfadó* [When the dog fell and Lucas got angry]), and a function word such as a conjunction (e.g., *Y el niño estaba mirando la rana* [And the boy was looking at the frog]) or preposition (e.g., *Lucas ve con el bote vacío* [Lucas sees with the empty jar]).

To check reliability, all transcripts and analyses were produced by four different professionals: two speech/language therapists who were participating in the program and two members of the research team. The agreement percentage was 94%.

The intervention program

The chronological age control group received no intervention of any sort; the SLI group received an intervention program during the 2012–13, 2013–14 and 2014–15 school years. A total of 216 sessions lasting 40 minutes each were conducted with a twice-weekly frequency. The program was based on the contributions of authors such as Hayward and Schneider (2000), Swanson et al. (2005), Gillam, Gillam, Petersen, and Bingham (2008), and Proctor-Williams (2014). The work was always done in the morning in the speech/language therapy classroom of each participating school, and was administered by a total of 18 speech/language therapists. The overall aim was to improve grammatical production in children with SLI. A two-pronged approach was used to achieve this.

The first part of each intervention session focused on narration of fictional stories. Here, the aim was to encourage acquisition of formal structural components; the use of temporal and causal connectives; the use of verbs (tense, aspect, and mode); the use of pronoun forms, prepositions, and articles; and the production of more complex utterances (coordinate, juxtaposed, and in particular subordinate clauses). Materials used included laminated sheets, comic strips or vignettes showing the story, different stories, icons representing the basic categories of the narrative structure, cards and pictograms, stickers for generating stories, notebooks and pencils. This part of the work took up about 30 minutes of each session.

Then, a series of morphosyntactic activities were carried out with the aim of optimizing the participants' production of different

syntactic structures. About 10 minutes of each session were reserved for this.

The fictional storytelling part of the session was divided into three phases, as described in more detail below.

Phase 1. Story retell. In this phase, the speech/language therapist narrated the story of "The Three Hungry Mice". The story included clear examples of the different story components and of sentences containing the grammatical forms targeted in the intervention. Before telling the story, the therapist began by asking the child if they had ever seen a mouse; they then selected words from the story and grouped them into different categories (verbs, nouns, adjectives, adverbs, etc.), after which their meaning was explained. Afterward, the child was shown how to use a series of icons or graphical organizers that represented each component of the narrative structure. Finally, the therapist told the story, using the icons for support, and immediately asking the child to retell it. The next step consisted in having the child tell the story without the icons. If, during the retelling, the child omitted part of the story or committed grammatical errors, the therapist would offer help in the form of both open and closed questions ("What problem did the mice have?"); cloze activities ("The mice were unhappy because _____"); recasting the child's sentence to model and correct a grammatical error (child: "*Los ratones hambrientos*" [The mice hungry], therapist: "*Los ratones estaban hambrientos*" [The mice were hungry]); vertical structuring (child: "*Tres ratones lloraban. Tenían mucha hambre*" [Three mice were crying. They were very hungry], therapist: "*Los tres ratones lloraban porque tenían mucha hambre*" [Three mice were crying because they were very hungry]); and imitating sentences with correct grammatical forms (*Eran tres ratones* ***que*** *tenían mucha hambre* [There once were three mice **who** were very hungry]; *Si no* ***buscaban*** *comida* ***pasarían*** *mucha hambre* [If they didn't **look for** food they **would be** very hungry]; *Los ratones están llorando.* ***Ellos*** *tenían mucha hambre* [The mice are crying. **They** were very hungry]; *El ratón* ***intentó*** *coger la manzana del árbol* [The mouse **tried** to pick the apple from the tree]; *Persiguieron al oso* ***cuando*** *llevaba la miel* [They chased the bear **as** it carried off the honey]; "*Soñaban con pizzas, tartas y manzanas* ***porque*** *tenían mucha hambre*" [They dreamt about pizza, cake and apples **because** they were very hungry]). If a child imitated the grammatical form correctly, the therapist recast it and asked the child to continue; if, however, the child's sentence was incorrect, the therapist added the syntactically relevant information and asked them to try again.

Phase 2. Making up stories. In this phase, the story of "The Three Hungry Mice" was told again, but this time with additional complications, new problems, etc. Here, the focus was on practicing dialogue and using coordinate and subordinate conjunctions, adverbs, adjectives, and metacognitive verbs. Afterward, the child was asked to make up a new story about a pet getting lost. For this, the child was given sheets containing icons or graphical organizers including all of the elements of the grammar history presented in order and in separate boxes. The child was asked to draw the story there, thereby facilitating the rapid representation of concepts and ideas. They were able to use the pictures they had drawn to support the oral narration. Finally, they were given the same sheets again, albeit this time without icons, to use in building their own stories.

Phase 3. Independent storytelling. Each child told their own story independently. Afterward, they had to tell it to their classmates. This new situation allowed them to practice the skills they had learned in the previous two phases. Once again, children were encouraged to use temporal and causal connectives.

In Phases 2 and 3, the speech/language therapist once again made use of grammar facilitation methods: modeling, recasting, vertical structuring, and imitation.

With respect to the more specific grammar production work, a series of morphosyntactic activities were carried out with the aim of optimizing the participants' knowledge, comprehension, and production of different syntactic structures; these activities included completing sentences, crossing out the incorrect words in sentences, sorting sentences, ordering and verbalizing patterned sequences of actions with drawings, placing phrases in their respective speech bubbles, sorting phrases aided by a card, and using support graphics to associate a phrase with a drawing. The material used for this included comics designed to encourage speaking, exercise sheets, and flashcard kits (Aguado, Ripoll, & Domezáin, 2003; Monfort, Juárez, & Monfort, 2008).

Before the start of the intervention program, the researchers and the speech/language therapists met in a series of seminars and workshops where the objectives, content, procedures and materials to be used in the program were explained. All intervention sessions were subject to direct observation and recorded throughout the implementation. The images obtained were subsequently analyzed in joint seminars in order to resolve the difficulties encountered and assess the achievements made, thereby ensuring the reliability of the intervention. In this regard, it was found that the intervention was indeed conducted according to plan throughout the course of the program, and that all speech/language therapists had followed the same guidelines.

Data analysis

Analyses conducted prior to the study examined the normality of the variables used in the design. Also, analyses of variance (ANOVAs) were performed for the variables age and IQ, as these were used to equate the two groups.

Eight analyses of covariance (ANCOVAs) were carried out for each dependent variable studied. First, we ran an ANCOVA to determine whether there were differences prior to starting the intervention program and thus establish the baseline. For this pretest analysis, age was used as a covariate, due to the wide intragroup age range. ANCOVAs were also run at the end of each of the three years of the intervention program, with age and the results of the previous year as covariates. Finally, an ANCOVA was run to determine whether there had been differential gains between years (1–0, 2–1, and 3–2), and another ANCOVA was performed to test whether there had been total gains following the three years of intervention (3–0). Age was the sole covariate used in these last ANCOVAs. SPSS v22 was used in all analyses.

Results

Prior analyses

The Kolmogorov–Smirnov test was used to verify the normality of the age variable ($z = 1.022$, $df = 68$, $p = .247$) and the non-verbal IQ ($z = .10$, $df = 68$, $p = .174$) To verify that the groups were well matched in these variables, a hypothesis test was performed. For the age variable, the ANOVA showed no significant differences between the two groups and a small effect size ($F(1, 66) = .02$; $p = .879$; $\eta p^2 = .02$; *Levene's* $F(1, 66) = .04$; $p = .853$). For the non-verbal IQ variable (K-BIT), the ANOVA also showed no significant differences between the two groups and a small effect size ($F(1, 57.81) = .15$; $p = .699$; $\eta p^2 = .01$; *Levene's* $F(1, 66) = 4.70$; $p = .034$).

Total ungrammaticality

An ANCOVA was run with the scores of the pretest administered before the start of the program and with the three posttest scores following each intervention year, for both groups, with the dependent variable *total ungrammaticality* (Table 2).

We see that significant differences existed prior to the start of the program (pretest scores). After the first and second intervention years (posttests 1 and 2), we see that the significant differences

Table 2
Descriptives and main effects of total ungrammaticality

Total ungrammaticality	SG ($n = 34$)		CG ($n = 34$)		ANCOVA		
	M	*SD*	*M*	*SD*	*F*	*p*	ηp^2
Pretest (0): Baseline	6.55	3.61	1.83	1.36	52.5	.001	.45
Posttest (1): First year	3.93	3.98	1.66	1.43	10.0	.002	.13
Posttest (2): Second year	3.86	3.24	1.37	1.75	15.1	.001	.19
Posttest (3): Third year	.70	.79	.46	.77	1.8	.182	.03
Gains first year (1–0)	−2.61	2.98	−.17	.87	21.1	.001	.25
Gains second year (2–1)	−.08	3.78	−.28	1.03	.2	.703	.00
Gains third year (3–2)	−3.15	3.12	−.91	1.70	13.2	.001	.17
Total gains (3–0)	−5.85	3.46	−1.37	1.55	50.3	.001	.44

Note. CG: control group, *M*: mean, *SD*: standard deviation, SG: pupils with SLI.

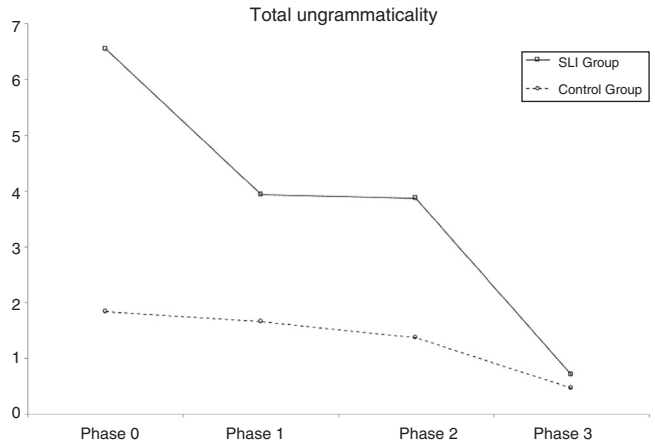

Figure 1. Total ungrammaticality gains.

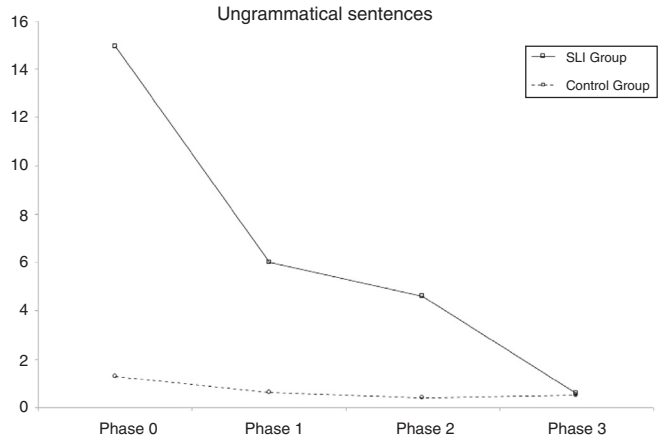

Figure 2. Ungrammatical sentence gains.

persisted, but the effect size, while still large, was reduced. However, after the third year of the program, the differences between the groups disappeared. With respect to gains in total ungrammaticality (Table 2), after the first and third years we observe more gains in SLI children, with a large effect size, while after the second year there were no differences between groups. Meanwhile, the total gains for the program after three years of intervention were significant, with a large effect size (Figure 1).

Ungrammatical sentences

Then, an ANCOVA was run with the scores of the pretest administered before the start of the program and with the three posttest scores following each intervention year, for both groups, with the dependent variable *ungrammatical sentences* (Table 3). Significant differences were observed in the pretest and after the first and second years of intervention, with a large effect size. However, after the third year the differences between the groups disappeared.

With respect to gains (Table 3), after the first and third years we observe more gains in SLI children, with a large effect size, while after the second year there were no differences between groups. The total gains for the program after three years of intervention were significant, with a large effect size (Figure 2).

Morphological errors

Then, an ANCOVA was run with the scores of the pretest administered before the start of the program and with the three posttest scores following each intervention year, for both groups, with the dependent variable *morphological errors* (Table 4). Significant differences were observed in the pretest and after the first and second intervention years, all with a large effect size. However, after the third year the differences between the groups disappeared.

Table 3
Descriptives and main effects of ungrammatical sentences

Ungrammatical sentences	SG ($n = 34$)		CG ($n = 34$)		ANCOVA		
	M	*SD*	*M*	*SD*	*F*	*p*	ηp^2
Pretest (0): Baseline	14.92	21.17	1.28	2.88	13.2	.001	.18
Posttest (1): First year	6.01	12.25	.62	1.54	6.0	.017	.09
Posttest (2): Second year	4.59	6.14	.40	1.32	13.9	.001	.19
Posttest (3): Third year	.59	1.68	.51	2.28	.2	.878	.00
Gains first year (1–0)	−8.91	18.78	−.65	2.88	6.2	.016	.09
Gains second year (2–1)	−1.43	11.87	−.23	1.55	.3	.570	.01
Gains third year (3–2)	−4.00	6.49	.10	2.55	10.9	.002	.15
Total gains (3–0)	−1.33	21.40	−.77	2.03	12.8	.001	.18

Note. CG: control group, *M*: mean, *SD*: standard deviation, SG: pupils with SLI.

Table 4
Descriptives and main effects of morphological errors

Morphological errors	SG ($n = 34$)		CG ($n = 34$)		ANCOVA		
	M	*SD*	*M*	*SD*	*F*	*p*	ηp^2
Pretest (0): Baseline	1.15	1.04	.30	.39	20.1	.001	.24
Posttest (1): First year	.70	1.00	.26	.35	5.8	.019	.08
Posttest (2): Second year	.77	1.05	.24	.38	7.2	.009	.10
Posttest (3): Third year	.11	.18	.09	.18	.2	.625	.00
Gains first year (1–0)	−5.85	3.27	−1.57	1.25	50.8	.001	.44
Gains second year (2–1)	−3.17	3.70	−1.41	1.26	6.9	.011	.10
Gains third year (3–2)	−3.74	3.22	−1.29	1.74	15.0	.001	.19
Total gains (3–0)	−6.44	3.62	−1.74	1.40	51.6	.001	.45

Note. CG: control group, *M*: mean, *SD*: standard deviation, SG: pupils with SLI.

Table 5
Descriptives and main effects of syntactic errors

Syntactic errors	SG ($n = 34$)		CG ($n = 34$)		ANCOVA		
	M	*SD*	*M*	*SD*	*F*	*p*	ηp^2
Pretest (0): Baseline	3.02	2.48	1.33	1.03	13.6	.001	.17
Posttest (1): First year	2.40	2.24	1.26	1.19	5.9	.018	.08
Posttest (2): Second year	2.35	1.99	1.08	1.48	8.8	.004	.12
Posttest (3): Third year	.51	.75	.30	.52	2.1	.154	.03
Gains first year (1–0)	−.62	3.22	−.07	.88	1.3	.265	.02
Gains second year (2–1)	−.04	2.72	−.18	.79	.13	.725	.00
Gains third year (3–2)	−1.84	1.92	−.77	1.42	6.55	.013	.09
Total gains (3–0)	−1.77	2.51	−1.03	1.18	9.52	.003	.13

Note. CG: control group, *M*: mean, *SD*: standard deviation, SG: pupils with SLI.

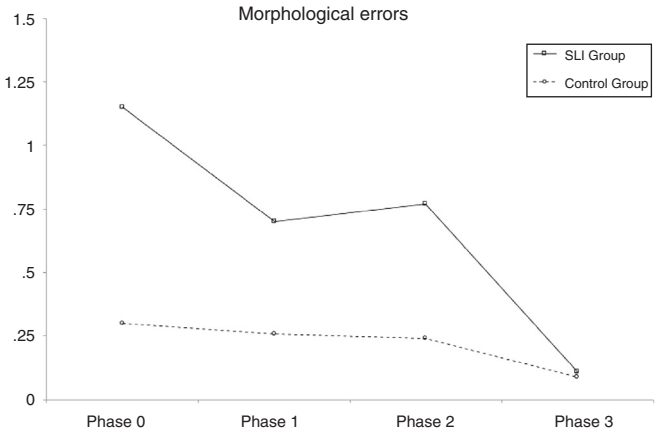

Figure 3. Morphological error gains.

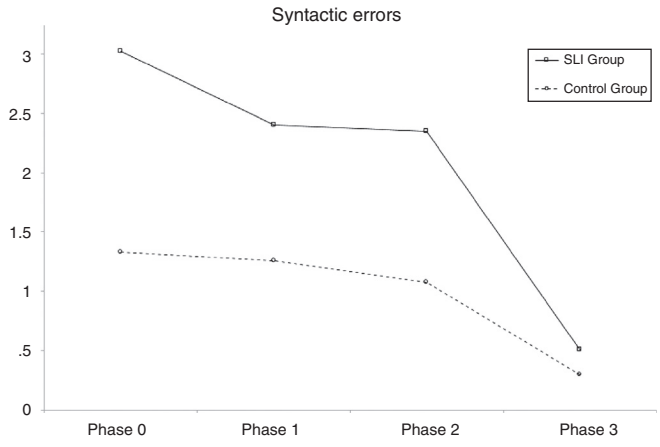

Figure 4. Syntactic error gains.

The trend in gains (Table 4) shows greater gains among children with SLI after each intervention year, with a large effect size. Also, total gains for the program after three years of intervention was significant, also with a large effect size (Figure 3).

Syntactic errors

Finally, an ANCOVA was run with the scores of the pretest administered before the start of the program and with the three posttest scores following each intervention year, for both groups, with the dependent variable *syntactic errors* (Table 5). Significant differences were observed in the pretest and after the first and second intervention year, with a large effect size. However, after the third year the differences between the groups disappeared.

With respect to gains (Table 5), no difference between the groups was observed after the first and second years, whereas after the third year the gains were greater among children with SLI, with a large effect size. The overall reduction after three years of intervention was significant, with a large effect size (Figure 4).

Discussion

Despite claims that difficulties with grammar constitute the most common type of problem in children with SLI (Mendoza, 2016), there have not been many empirical studies aiming to verify what type of strategies and activities are the most effective at improving these difficulties, particularly in primary school. This is the main aim of the present study, in which we test whether an intervention program combining fictional storytelling and morphosyntactic activities, as suggested by authors such as Swanson et al. (2005) and Proctor-Williams (2014), has positive

effects on reducing ungrammaticality in Spanish-speaking children with SLI.

Excellent results were obtained. The first aim, which was to reduce total ungrammaticality in pupils with SLI, meets a clearly established criterion identified in previous research on morphosyntactic intervention, whereby it is recommended that a broad range of strategies be applied over a long period (Eisenberg, 2014). The fact is that grammar problems do not tend to be resolved quickly; on the contrary, there is a need for repeat practice, for multiple opportunities, and for a gradual modification of strategies with a view to reducing learning effort in children with SLI (Proctor-Williams, 2014). This program took these recommendations into account, and ensured that many different strategies would be used, all within the framework of what is known as the "implicit" approach (Ebbels, 2014), which is key to ensuring that pupils with SLI can learn to identify grammar rules and to construct the forms that they tend to omit or produce incorrectly (Mendoza, 2016). Therefore, as stated by Eisenberg (2013) and Gillam and Gillam (2016), the combination of strategies such as recasting, vertical structuring, focused stimulation, modeling, and imitation provide pupils with SLI with more elaborate models to stimulate their complex grammatical production.

With respect to the second aim, which was to limit the production of ungrammatical sentences, the program developed for this study was found to be effective: as can be seen in the results, the production of ungrammatical sentences experienced a statistically significant reduction. We believe that the introduction of morphosyntactic activities played a key role in this, as these were used to ensure an even more intense focus on grammar aims. This was done, for instance, by means of exercises involving crossing out the incorrect word in a sentence, placing sentence parts in the correct order, or using graphic elements to associate a phrase with a drawing. His ensured that pupils with SLI were regularly exposed to the required grammatical structures (Eisenberg, 2014).

We see that it is also possible to reduce considerably the production of grammatical errors, both morphological and syntactic, which was the third aim of this study. Here, stimulation in the production of more elaborate narratives facilitates the production of a discourse with a better linguistic structure and without morphological or syntactic errors. All of this is made possible by the application of strategies that offer appropriate input to encourage pupils with SLI to use the correct grammatical elements and structures. It is true that this type of activity requires more initial effort on the part of the speech/language therapist, but it is equally true that this effort is compensated for by the abundant opportunities it creates for meaningful learning, which can assure the success of the intervention (Proctor-Williams, 2014).

Finally, we feel it pertinent to add that this study offers the educational community a comprehensive or holistic model defined by three interactive, practical levels. First, ambiguity is reduced through the definition of explicit aims, the stimulation of correct production, and the provision of corrective feedback (Eisenberg, 2013). The material used at this level involves more structured, guided morphosyntactic activities (Leonard, 2011). Second, we introduce and combine tasks within more complex linguistic contexts by encouraging the production of oral narratives (Pérez, 2013) and using implicit teaching techniques (e.g., recasting, focused stimulation). Third, as indicated by Proctor-Williams (2014), we need to look more closely at what may be the main limitation of this study, i.e., the need to involve other educational partners, such as parents and teachers of children with SLI, in the intervention. Their collaboration is a key to ensuring better learning and to applying gains at the morphosyntactic level to more natural contexts.

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References

Aguado, G., Ripoll, J., & Domezáin, M. (2003). *Comprender el lenguaje haciendo ejercicios*. Madrid: Entha.

Anderson, R. (2007). Exploring the grammar of Spanish-speaking children with specific language impairment. In J. Centeno, R. Anderson, & L. Obler (Eds.), *Communication disorders in Spanish speakers* (pp. 113–126). Clevedon: Multilingual Matters Ltd.

Bosch, L., & Serra, M. (1997). *Grammatical morphology deficits in Spanish-speaking children with SLI. Child language disorders in a cross-linguistic perspective*. Amsterdam: Paper presented at the Fourth Symposium of the European Groups on Child Language Disorders.

Coloma, C., Araya, C., Quesada, C., Pavez, M., & Maggiolo, M. (2016). Grammaticality and complexity of sentences in monolingual Spanish-speaking children with specific language impairment. *Clinical Linguistics and Phonetics*, *30*(9), 649–662. http://dx.doi.org/10.3109/02699206.2016.1163420

Dunn, L., Dunn, L., & Arribas, D. (2006). *PPVT-III Peabody: Test de vocabulario en imágenes*. Madrid: TEA.

Ebbels, S. (2008). Improving grammatical skill in children with specific language impairment. In C. Norbury, B. Tombling, & D. Bishop (Eds.), *Understanding developmental language disorders* (pp. 149–174). Hove: Psychology Press.

Ebbels, S. (2014). Effectiveness of intervention for grammar in school-aged children with primary language impairments: A review of the evidence. *Child Language Teaching and Therapy*, *30*, 7–40. http://dx.doi.org/10.1177/0265659013512321

Eisenberg, S. (2013). Grammar intervention. *Topics in Language Disorders*, *33*, 165–178. http://dx.doi.org/10.1097/tld.0b013e31828ef28e

Eisenberg, S. (2014). What works in therapy: Further thoughts on improving clinical practice for children with language disorders. *Language, Speech and Hearing Services in Schools*, *45*, 117–126. http://dx.doi.org/10.1044/2014_LSHSS-14-0021

Gillam, S., & Gillam, R. (2016). Narrative discourse intervention for school-aged children with language impairment: Supporting knowledge in language and literacy. *Topics in Language Disorders*, *36*, 20–34. http://dx.doi.org/10.1097/tld.0000000000000081

Gillam, S., Gillam, R., Petersen, D., & Bingham, C. (2008). *Narrative Language Intervention Program: Promoting oral language development*. Chicago, IL: Research presentation at the American Speech-Language-Hearing Association Annual Convention.

Grinstead, J., Baron, A., Vega-Mendoza, M., de la Mora, J., Cantú-Sánchez, M., & Flores, B. (2013). Tense marking and spontaneous speech measures in Spanish specific language impairment: A discriminant function analysis,. *Journal of Speech, Language, and Hearing Research*, *56*, 352–363. http://dx.doi.org/10.1044/1092-4388(2012/11-0289)

Gutiérrez-Clellen, V., Restrepo, M., & Simon-Cereijido, G. (2006). Evaluating the discriminant accuracy of a grammatical measure with Spanish-speaking children,. *Journal of Speech, Language and Hearing Research*, *49*, 1209–1223. http://dx.doi.org/10.1044/1092-4388(2006/087)

Hadley, P. (2014). Approaching early grammatical intervention from a sentence-focused framework. *Language, Speech and Hearing Services in Schools*, *45*, 110–116. http://dx.doi.org/10.1044/2014_LSHSS-14-0017

Hayward, D., & Schneider, P. (2000). Effectiveness of teaching story grammar knowledge to pre-school children with language impairment: An exploratory study. *Child Language Teaching and Therapy*, *16*, 255–284. http://dx.doi.org/10.1177/026565900001600303

Hunt, K. (1965). *Grammatical structure written at three grade levels*. Champaign, IL: National Council of Teachers of English.

Jackson-Maldonado, D., Bárcenas, R., & Alarcón, L. (2013). Variabilidad morfosintáctica en las narrativas de niños con trastorno específico de lenguaje. In R. Barriga (Ed.), *Las narrativas y su impacto en el desarrollo lingüístico infantil* (pp. 691–728). México, D.F.: El Colegio de México.

Kaufman, A., & Kaufman, N. (2000). *Kaufman Brief Intelligence Test (K-BIT)*. Madrid: TEA.

Kirk, S., McCarthy, J., & Kirk, W. (2005). *Illinois Test of Psycholinguistic Abilities*. Madrid: TEA.

Leonard, L. (2011). The primacy of priming in grammatical learning and intervention: A tutorial. *Journal of Speech, Language, and Hearing Research*, *54*, 608–621. http://dx.doi.org/10.1044/1092-4388(2010/10-0122)

Leonard, L. (2014). *Children with specific language impairment* (2nd ed.). Cambridge: The MIT Press.

Mayer, M. (1969). *Frog, where are you?* New York: Dial.

Mendoza, E. (2016). *Trastorno específico del lenguaje*. Madrid: Pirámide.

Miller, J., Andriacchi, H., & Nockerts, A. (2012). *Assessing language production using SALT software*. Middleton: SALT Software LLC.

Monfort, I., Juárez, A., & Monfort, M. (2008). *Logokit 1*. Madrid: Entha Ediciones.

Pérez, E. (2013). *Diagnóstico e intervención en las dificultades evolutivas del lenguaje oral*. Barcelona: Lebón.

Proctor-Williams, K. (2014). Treatment for morphosyntactic deficits: From specific strategies to a holistic approach. *Perspectives on Language Learning and Education*, *21*, 192–202. http://dx.doi.org/10.1044/lle21.4.192

Semel, E., Wiig, E., & Secord, W. (2003). *Clinical evaluation of language fundamentals*. San Antonio: Psychological Corporation.

Swanson, L., Fey, M., Mills, C., & Hood, L. (2005). Use of narrative-based language intervention with children who have specific language impairment. *American Journal of Speech Language Pathology*, *14*, 131–143. http://dx.doi.org/10.1044/1058-0360(2005/014)