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# The complexity of narrative interferes in the use of conjunctions in children with specific language impairment

## *A complexidade da narrativa interfere no uso de conjunções em crianças com distúrbio específico de linguagem*

### ABSTRACT

**Purpose:** To verify the use of conjunctions in narratives, and to investigate the influence of stimuli's complexity over the type of conjunctions used by children with specific language impairment (SLI) and children with typical language development. **Methods:** Participants were 40 children (20 with typical language development and 20 with SLI) with ages between 7 and 10 years, paired by age range. Fifteen stories with increasing of complexity were used to obtain the narratives; stories were classified into mechanical, behavioral and intentional, and each of them was represented by four scenes. Narratives were analyzed according to occurrence and classification of conjunctions. **Results:** Both groups used more coordinative than subordinate conjunctions, with significant decrease in the use of conjunctions in the discourse of SLI children. The use of conjunctions varied according to the type of narrative: for coordinative conjunctions, both groups differed only between intentional and behavioral narratives, with higher occurrence in behavioral ones; for subordinate conjunctions, typically developing children's performance did not show differences between narratives, while SLI children presented fewer occurrences in intentional narratives, which was different from other narratives. **Conclusion:** Both groups used more coordinative than subordinate conjunctions; however, typically developing children presented more conjunctions than SLI children. The production of children with SLI was influenced by stimulus, since more complex narratives has less use of subordinate conjunctions.

### RESUMO

**Objetivo:** Verificar o uso de conjunções em narrativas e investigar a influência da complexidade dos estímulos sobre o tipo de conjunção utilizada, tanto em indivíduos com distúrbio específico de linguagem (DEL) quanto em sujeitos com desenvolvimento típico de linguagem. **Métodos:** Participaram da pesquisa 40 sujeitos (20 em desenvolvimento típico de linguagem e 20 com DEL), com idades variando entre 7 e 10 anos, pareados por faixa etária. Para obter as narrativas foram utilizadas 15 seqüências lógico-temporais de complexidade crescente, classificadas em mecânicas, comportamentais e intencionais, representadas por quatro cenas cada uma. As narrativas foram analisadas quanto à ocorrência e à classificação das conjunções. **Resultados:** Ambos os grupos utilizaram mais conjunções coordenativas do que subordinativas, com significativa redução do emprego de conjunções no discurso das crianças com DEL. A utilização das conjunções variou quanto ao tipo de narrativa, sendo que para as conjunções coordenativas, ambos os grupos diferiram apenas entre as narrativas intencionais e as comportamentais, com maior ocorrência nas comportamentais. Para as conjunções subordinativas, o desempenho das crianças em desenvolvimento normal não diferiu entre as narrativas, enquanto, no grupo com DEL nas intencionais houve menor ocorrência, diferindo das outras narrativas. **Conclusão:** Ambos os grupos apresentaram maior uso de conjunções coordenativas do que subordinativas, porém, os sujeitos em desenvolvimento normal apresentaram mais conjunções do que os indivíduos com DEL. A produção das crianças com DEL sofreu influência do estímulo, uma vez que em narrativas mais complexas houve menor uso de conjunções subordinativas.

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**Conflict of interests:** None

## INTRODUCTION

Language development involves the integration of phonology, semantics, pragmatics and morphosyntax, and also other linguistic and non-linguistic abilities. One of the most critical aspects in this process is morphosyntax's mastery, because it comprehends ordered use of essential linguistic elements to build a phrase<sup>(1-5)</sup>.

Grammatical development analysis may be done by narrative production, since it is a task that involves real competition between cognitive, linguistic and interactional aspects<sup>(6,7)</sup>.

At early stages of typical language development, the child says simple phrases, and later he/she will be able to use coordinative sentences and, afterwards, subordinate sentences<sup>(8)</sup>.

Among grammatical elements, conjunctions are responsible for connecting sentences or terms with the same syntactic function, which determines dependency or coordinative relations. In Portuguese they are divided into coordinative – responsible for connecting sentences or terms with the same syntactic function – or subordinate – characterized for connecting elements from different syntactic levels in which one sentence is a syntactic member of the other<sup>(9)</sup>.

During language acquisition, the additive conjunctions are the first to emerge, followed by those that express causal or temporal relations and opposite ideas, which are already used flexibly by three-year-olds<sup>(8)</sup>.

However, in children with specific language impairment (SLI), primary impairment of language acquisition<sup>(10,11)</sup>, one of the remarkable characteristics is great difficulty in learning and storing closed-class words – words with meanings restricted to phrasal context, such as conjunctions<sup>(8,12,13)</sup>. Moreover, when compared to chronological peers with typical language development, SLI children show a more prominent morphosyntax impairment with discursive elaboration damage<sup>(1,8,11,14)</sup>. It happens because their narratives are characterized by less syntactically complex sentences, restricted use and errors associated to grammatical elements, low number of complete episodes, and cohesion failures<sup>(15-20)</sup>.

In preschool children, the word class that better distinguish those within typical language development from those with SLI is the conjunction, which independent of the type, is always scarce in children's speech<sup>(8)</sup>. This situation is probably justified by the fact that using conjunctions involves not only syntactic rules comprehension but also organization of ideas and establishment of causal and temporal relations<sup>(8)</sup>.

Therefore, the purpose of this research was to verify the use of conjunctions in narratives, and to investigate the influence of stimuli's complexity over the type of conjunctions used by children with specific language impairment (SLI) and by children with typical language development.

## METHODS

This research and its term of free and informed consent were approved by the Ethics Committee for the Analysis of Research Protocols (CAPPesq) of the General Hospital of the School of Medicine of Universidade de São Paulo (USP), under protocol number 0666/07.

## Subjects

Participants were divided into typical language development group (TLD) (20 children) and specific language impairment group (SLI) (40 children). Each group was composed by five subjects paired by age range, with ages between 7 and 10 years.

The inclusion criteria for the TLD group involved: no complaints or previous intervention with speech-language pathologist; good communicative pattern and satisfactory academic performance according to the teachers; and adequate performance in phonology<sup>(21)</sup>, writing and phonological awareness<sup>(22)</sup>.

For the SLI group, subjects should be in weekly speech-language therapy and be diagnosed with SLI, according to international diagnostic criteria – linguistic deficits and intellectual quotient (IQ) within normal. For this diagnosis, the child should show results lower than average in at least two standardized language tests, considering the battery of child language evaluation ABFW<sup>(23)</sup> and the mean length utterance assessment<sup>(8)</sup>.

The minimum time of speech-language therapy of each subject from the SLI group was six months, and the average was three years. It is important to mention that 9- and 10-year-old children were in therapy for a longer time, because their linguistic impairment is more severe.

## Procedures

Data collection used a series of 15 stories, presented by figures, each of them represented by four scenes. The histories were classified according to the relations between characters, and complexity was gradually increased<sup>(24,25)</sup>:

- Mechanical I: objects casually interact with one another;
- Mechanical II: people and objects casually act with each other;
- Behavioral I: one person in daily situations without attribution of mental states;
- Behavioral II: person in social situation, involving more than one person, without attribution of mental states;
- Intentional: person in daily activities requiring attribution of mental states.

During interaction with each subject, one of the researchers explained that the sequence of four scenes composed a history. The first scene was presented and, only when all its elements were understood, the other three scenes should be disorderly showed. The child was asked to coherently organize them. Hereafter, the child should tell the history, which was recorded in a digital recorder. This procedure was repeated for each of the 15 histories in the same sequence for all the subjects.

After the transcription of the speech sample, the conjunctions used by the children of both groups were counted (quantitatively) for each history and for the total of 15 histories. They were later analyzed and classified as coordinative or subordinate conjunctions.

## Data analysis

Statistical analyses were carried out using the following

**Table 1.** Comparison between SLI and control group considering production of conjunctions

Conjunction	Group	Minimum	Maximum	Mean	SD	SE	t-value	p-value
Total	SLI	6	46	26.90	11.406	2.55	-2.594	0.016*
	TLD	16	156	46.15	31.171	6.97		
Coord	SLI	5	42	22.70	10.219	0.78	-2.276	0.029*
	TLD	14	100	33.40	18.372	3.06		
Sub	SLI	0	12	4.20	3.518	2.28	-2.700	0.013*
	TLD	2	56	12.75	13.719	4.11		

\* Significant values (p<0.05) – Independent T-test

**Note:** Coord = coordinative conjunction; Sub = subordinate conjunction; SD = standard deviation; SE = standard error; SLI = specific language impairment group; TLD = typical language development group

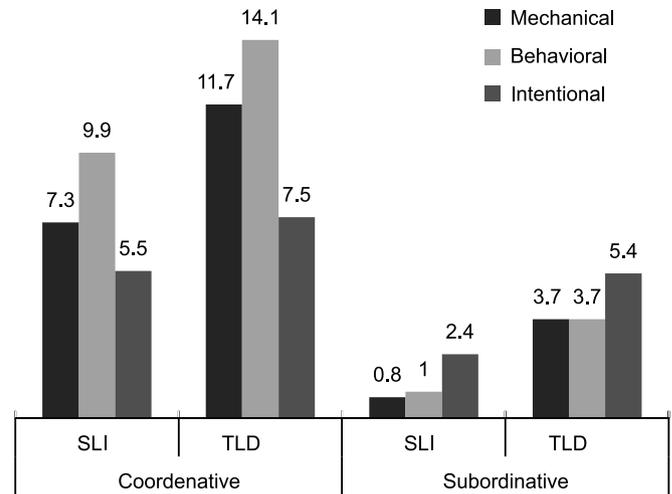
tests: paired and independent, and analysis of variance (ANOVA) for comparisons between groups for each variable, assuming equality of variance and normal distribution. For multiple comparisons Tukey test was used. The significance level adopted was 5%.

**RESULTS**

The analysis of the mean use of conjunctions revealed that both groups used more coordinative than subordinate conjunctions, with significant reduction in the use of conjunctions in the discourse of SLI children (Table 1 and 2).

The comparison between type of narrative and complexity of conjunctions used showed that the use of conjunctions varied according to the type of narrative (Table 3 e Figure 1).

In coordinative conjunctions, the performance of both groups differed only between intentional and behavioral narratives, with higher occurrence in behavioral (TLD: f=3.954, p=0.025; SLI: f=5.855, p=0.005). In subordinate conjunctions, typically developing children’s performance were similar between narratives. However, there was difference between



**Figure 1.** Comparison between mean occurrence of each type of conjunction in each group and in each type of narrative

mechanical and intentional and between behavioral and intentional among SLI children, with less occurrence in intentional narratives (f=6.189, p=0.004) (Table 3).

**Table 2.** Comparison between the productions of coordinative and subordinate conjunctions in each group

Group	Conjunction	t-value	p-value
SLI	Coordinative	8.131	<0.001*
	Subordinate		
TLD	Coordinative	10.337	<0.001*
	Subordinate		

\* Significant values (p<0.05) – Paired T-test

**Note:** SLI = specific language impairment group; TLD = typical language development group

**Table 3.** Comparison between conjunction’s type in each group and by type of narrative

Conjunction	Group	F	p-value	Tukey
Coordinative	SLI	5.855	0.005*	Mec = Behav; Mec = Inten; Inten ≠ Behav
	TLD	3.954	0.025*	Mec = Behav; Mec = Inten; Inten ≠ Behav
Subordinate	SLI	6.189	0.004*	Mec = Behav; Mec ≠ Inten; Inten ≠ Behav
	TLD	0.759	0.473	----

\* Significant values (p<0.05) – ANOVA

**Note:** Mec = mechanical narrative; Behav= behavioral narrative; Inten = intentional narrative; SLI = specific language impairment group; TLD = typical language development group

**DISCUSSION**

In verifying the use of conjunctions in narratives, we found a higher incidence of coordinative conjunctions, in detriment of subordinate, in both groups. This predominance might be easily understood because coordinative conjunctions express, in language, simpler relations between events and sentences<sup>(9)</sup>.

Our findings indicate that the use of conjunctions is still in evolution in 10-year-old children, showing that the upgrading of more refined aspects of oral language extends beyond the schooling stage<sup>(14,16)</sup>.

The difference of performance between groups reinforces that narrative production of SLI children has simpler phrasal structures, lack of temporal markers and less cohesion elements<sup>(16,17)</sup>. This prejudice may be explained by the fact that cognitive and linguistic demands involved in the use of conjunctions is beyond their processing capacity<sup>(8,9,15)</sup>. In the case of subordinate conjunctions, which require more knowledge of the language, the scarce occurrence in the SLI group is also influenced by the impairment related to the comprehension of the syntactic rules of language<sup>(8)</sup>.

Linguistic comprehension results from the child's ability to perceive information provided by elements of his/her mother tongue, such as redundancies and regularities. Therefore, the comprehension of utterances with more elaborate sentence structure requires mastery of this ability associated with enough working memory resources<sup>(26)</sup>. It is interesting to note that according to some recent researches seeking to understand SLI grammatical impairment by probabilistic knowledge, memory and comprehension impairments in SLI may favor these children to have restricted access to more elaborate linguistic stimuli, considerably reducing their chances to learn language<sup>(27,28)</sup>.

On the other hand, the influence of stimuli complexity in the type of conjunction used was clear and more pronounced in the SLI group. The use of conjunctions was more restricted in complex narratives, but only in the typical language development group this decrease was associated with a discrete growth in subordinate conjunctions.

As the production of narratives that attribute intentions to characters is a task with high abstraction demand and linguistic elaboration, which are exactly two of the main difficulties faced by SLI children, their lower performance compared to TLD group is understood<sup>(8,15)</sup>. On the other hand, it is interesting to note that the scarcity of complex sentences such as subordinate, which require use of conjunctions, influences the expression of the character's mental state during narrative production, impairing discourse performance on daily situations<sup>(1,29)</sup>.

Therefore, for the SLI group, complexity increase generates an overload on linguistic system that harms narratives' abilities and influences language comprehension, ideas organization and expressing temporal and causal relations difficulties<sup>(1,15-20)</sup>.

We also notice that these difficulties persist with age, since SLI children's world perception is impaired by linguistic restriction. Hence, although older children in general have been submitted to more speech-language therapy, clinical practice shows that these children have worse linguistic performance, including impairments in social abilities<sup>(30)</sup>.

Thus, the impairment observed in the use of conjunctions by SLI children points to the conversational difficulties that these children face every day. This fact highlights the importance of intervention efforts to favor social competence development, which implies in benefits to social, academic and behavioral aspects.

Finally, it is necessary to mention that further studies with wider age groups, allowing comparison between them, may help to comprehend the impact of schooling over the use of conjunctions, which might expand our knowledge about grammatical development and narratives abilities.

## CONCLUSION

When compared to typically developing children, the group with SLI shows scarce use of conjunctions, especially when associated with the increase of narratives' complexity.

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