# Clause Complexity in Children with SLI/LDD

Subjects: Others

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Specific Language Disorder (SLI) or Developmental Language Disorder (DLD) is a developmental disorder characterized by a set of difficulties that affect language acquisition. This disorder manifests itself as an important limitation in the expression and/or comprehension of oral language, which affects communicative practices in speech and language processing.

Keywords: grammar ; clause complexity ; longitudinal study ; specific language impairment (SLI)

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## 1. Syntactic Complexity in Spanish-Speaking Children with SLI/DLD

Several studies on sentence complexity across different languages indicate that it poses a significant challenge for children with SLI/DLD [1][2][3][4][5][6][7][8]. Research on Spanish-speaking children with SLI/DLD has found that they exhibit difficulties in both sentence comprehension and production, particularly in the area of complex sentences [1][2][9]. Moreover, production difficulties seem to be more pronounced as sentence complexity increases [10]. These challenges are also more prevalent in contexts that require the use of more sophisticated linguistic resources, such as narrative discourse production [11][12].

**Simple and Complex Structures**

Many studies on morphosyntactic complexity in children with SLI/DLD have focused on analyzing their language samples in terms of simple sentences and those related to coordination and subordination mechanisms. It has been found that compared to coordinated sentences, children with SLI/DLD have fewer problems with simple sentences [10]. Furthermore, it has been suggested that these children tend to use simple sentences more frequently than complex ones [13] and prefer using simple and coordinated sentences over complex sentences [2][5][10][14].

The analysis of syntactic complexity in children with SLI/DLD considers different perspectives on the concept of complexity. Some studies include coordinated sentences in their description of compound sentences, which they consider as constitutive of complexity. In this regard, it has been observed that children with SLI/DLD use significantly fewer compound sentences than their typically developing peers [1]. Other studies focus only on subordination, which involves integrating one clause within another [13][15][16]. From this perspective, it has been found that children with SLI/DLD have lower production of subordinate clauses than typically developing children [2][4][9][17][18]. However, some studies have not found these differences to be statistically significant, at least in narrative language samples [13][16].

## 2. Longitudinal Development and Trajectory of Syntactic Complexity in Children with Typical Development (TD) and with SLI/DLD

The use of subordinate clauses as a mechanism of syntactic complexity in children's linguistic development highlights their ability to produce sentences that are dependent on others [19]. Typically developing children begin to use two or more verbs in a sentence around 2 years of age, with complex syntax emerging around 30 months; however, the structures and functions involved in complexity are not fully consolidated until after three years of age [7][16]. The developmental trajectory among preschool children with typical development demonstrates substantial and noteworthy variations. Despite these variations, children demonstrate a certain degree of complexity in their statements before the age of four [20]. However, coordinated clauses remain prevalent during the preschool age [7]. By 6 years of age, they handle syntactically more complex linguistic structures than in preschool years [21], although simple sentences are still used more frequently than complex sentences. In the first years of schooling, from age 6 onwards, the use of subordination increases significantly [22]. Finally, studies indicate that typically developing children use more complex clauses at 10 years than at 8 years [23].

On the other hand, children with SLI/DLD preferably use simple sentences between 4 and 6 years of age [5]. However, certain indicators of complex syntax have also been observed in a longitudinal case study involving a child at the age of 5

years and 9 months [8]. It has also been observed that these children use significantly fewer compound sentences in their narratives between the ages of 4 to 11 [1]. Furthermore, Pavez et al. [24] and Coloma et al. [25] showed that, at 6 years of age, children with SLI/DLD maintained the same level of production of complex structures as a control group of 4-year-olds in narrative samples. Regarding conversation, it has been suggested that both children with SLI/DLD and those with language delay produce fewer complex structures than their typically developing peers [4][26]. In this regard, Hincapié-Henao et al. [9] state that children with SLI/DLD have great difficulty in producing complex verbally formulated structures. Among these structures, constructions that reflect hypotactic relationships with time-related, final, and comparative value are also especially challenging [10].

Describing the development of language longitudinally allows, on the one hand, to determine different growth patterns or trajectories that could define characteristics of typical and atypical language [8][27][28] and, on the other, to investigate in greater depth the issue of the persistence of SLI/DLD difficulties over time [29]. Law and Tomblin [28] mention three hypotheses that explain the possible development patterns of language skills in children with SLI/DLD: (1) they coincide at the same starting point and diverge over time ("deterioration hypothesis"); (2) they develop at the same speed, but stop at a certain point, without further development ("plateau hypothesis"); and (3) they take off later, but their language development, although delayed, parallels that of typical development ("tracking hypothesis"). According to Law and Tomblin [28], a reduced heterogeneity is observed in the growth characteristics of children with language disorders, a trajectory that would be similar to that of children with typical language development, at least in the school years, which would be consistent with the explanation of the tracking hypothesis. This finding coincides with the position that, although these children would be delayed, they would not be qualitatively different from children with TD [30]. In this regard, it has also been suggested that children with TD and SLI/DLD would follow a similar path, although children with SLI/DLD obtain lower results [29]. However, it is necessary to emphasize, at this point, that the competence and speed of development in children with SLI/DLD is lower than in children with typical development with respect to the emergence of syntactic complexity at the beginning of these trajectories [15][25] and that the specific characteristics of this starting point provide evidence that widespread vulnerabilities in complex syntax acquisition could typify SLI/DLD [8].

## 3. Approaches for the Description of Syntactic Complexity in Children with TD and SLI/DLD

Various approaches have been utilized to assess complexity in children with typical development and SLI/DLD. These methods offer distinct viewpoints and outcomes, with some focusing on quantitative aspects and others on qualitative aspects. Quantitatively, syntactic complexity has been evaluated based on the average length of specific units, such as sentences, clauses, or utterances. Brown [31] proposed the Mean Length of Utterance (MLU) measurement for analyzing children's language in early developmental stages, which is systematically related to age and accounts for the development of syntactic maturity [32]. This index has been used in studies on various languages, including Spanish [33], English [34], and Portuguese [35], in children with TD and SLI/DLD. The MLU has been linked to other measures of complexity, enabling researchers to observe that older children produce longer linguistic units containing more clauses [19]. Combining the MLU with other indices of ungrammaticality has facilitated the identification of children with language difficulties [36]. Additionally, measuring the MLU in bilingual children with TD (English–Spanish) has been predictive of their language skills in an English narrative retelling test, although the same result was not obtained in Spanish [37].

An alternative approach to measuring syntactic complexity involves focusing on clauses and their relationships, as proposed by Hunt [38][39] (1965, 1970). According to this generativist perspective, a terminal unit (T-unit) is composed of a main clause and any attached or embedded clauses or non-clausal structures, representing both paratactic (juxtaposed and coordinated clauses) and hypotactic (subordinate clauses) relationships. This method allows for the quantitative growth of T-units to be visualized as a child's development becomes more complex, with indices increasing in parallel with age, schooling, and intellectual level [39].

Describing language samples of children with SLI/DLD has frequently employed the quantification and structural analysis of simple, coordinated, and subordinate sentences as a means of characterizing language complexity [1][2][9][13][15][16][17]. Within this tradition, sentence complexity is typically interpreted based on the presence or absence of different types of sentences, with complexity often referring to utterances that exceed the limits of a clause [16].

Another approach to measuring language complexity involves a qualitative analysis of language samples, focusing not only on syntax, but also on thematic and discursive criteria. In this tradition, researchers have analyzed the distribution and organization of clauses based on interclausal relationships, which can be classified as isotactic, symmetrical and asymmetrical paratactic, hypotactic, and endotactic. For example, Alfaro, Crespo, and Alvarado [14] studied these relationships in a narrative sample of children with SLI/DLD and typically developing children. They found that the

SLI/DLD group produced more paratactic relationships than the TD group, although this difference was not statistically significant. This finding suggests that the SLI/DLD group produced less informative texts, indicating lower complexity.

From a systemic–functional perspective, the interpretation of the role of interdependence between clauses (parataxis and hypotaxis) is different. In this approach, clauses, which are considered as the central unit of grammatical meaning, are capable of expressing different types of meaning simultaneously and their function is explained by how they work together [40]. The logical system of "taxis" (from the Greek: order, arrangement, and category) captures the relationship of dependency and interdependence between adjacent clauses, which may be potentially part of different types of clause complexes [41]. At the semantic level, clause complexes illustrate how a flow of events develops and becomes a text [42]. According to this theoretical perspective, differences in the structure of oral or written texts reflect differences of a semantic nature [40][43].

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