

COMPARING DIFFERENT ASPECTS OF MORPHOSYNTACTIC ABILITIES IN A GROUP OF CHILDREN WITH DEVELOPMENTAL DYSLEXIA

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Abstract: *The study examined oral language abilities in a group of 29 dyslexic children, compared to two control groups (130 normally developing age-matched children and 44 normally developing younger children). The experimental procedure consisted of tasks involving morphosyntactic agreement (both in listening and reading modality) and clitic production. The major findings revealed that a) both children with Developmental Dyslexia (DD) and age-matched controls performed differently in the two modalities; b) a subgroup in DD and in controls exhibited a significant impairment with clitic structures.*

Keywords: *dyslexia, morpho-syntactic agreement, object clitics.*

1. Introduction

SLI and Dyslexia are both developmental disorders: the first one affects the acquisition of oral language and it is often characterized in terms of problems with morphosyntax; the second one is a specific impairment in the acquisition of reading and spelling skills despite normal or above-average intelligence. Children with SLI show difficulties in different areas of language: phonology, morphosyntax and syntax. Although children with developmental dyslexia have typically the phonology or phonology related processes impaired, there is also growing evidence that other language components, such as morphosyntax, and syntax are also affected in these children (Guasti, 2013, Friedmann and Grodzinsky, 1994).

In the United States 91% of speech therapists treat phonological/reading disorders, but only 60% treat individuals with SLI (American Speech Language Hearing Association, 2008). However, McArthur et al.(2000) and Stojanovik and Riddell (2008) report 55% of overlap of people with Dyslexia and SLI, and some studies (Bishop and Snowling, 2004) suggest that the two disorders are supposed to have the same incidence in the population, 3-10%. So, it is very likely that a certain percentage of people with a diagnosis of Dyslexia also presents the symptoms of SLI, even though the latter has never been diagnosed or treated.

The purpose of this study is to discuss data on the production and comprehension of particular syntactic agreement configurations and functional items, such as clitics pronouns, by children with developmental dyslexia in order to examine their oral and reading skills.

2.1 Material and Methods

Agreement Test

In their study, Moscati and Rizzi 2013, 2014 test different type of configurations in Italian, from a minimum (Determiner-Noun) to a maximum (Clitic-Past Participle) of

complexity in terms of derivational operations. The ranking of configurations, in terms of complexity, has predictive capacities with respect to the timing at which the different agreement configurations are fully mastered in development. Following Moscati and Rizzi 2013, 2014, five different morpho-syntactic agreements were investigated:

- (1) a. D-N agreement:
 La mamma
 The f,sing mother f,sing
- b. Subj -V agreement:
 Carolina canta
 Carolina 3P,sing sings 3P,sing
- c. V- Subj. agreement:
 Escono le principesse
 Get out 3P,plur the princesses 3P,plur
- d. Clitic – Past-Part agreement:
 Marco le ha viste
 Marco them f,plur has seen f,plur
- e. Subj. - Unacc. PastPart agreement:
 I soldati sono arrivati
 The soldiers m,plur are arrived m,plur

The simplest case is (1a), D – N agreement, which does not involve movement at all:

- (2) D [NP ... N ...]

Subj – V agreement (1b) involves movement of the subject from its thematic position in the vP to the Spec position of a functional head (Rizzi 2006, Rizzi & Shlonsky 2007 etc.).

- (3) _AgrS [vP DP]

V- Subj. Agreement (1c), according to Belletti 1988, 2001, 2004, implies a focalization of the subject. The subject moves to the specifier of FocusP and the Verb raises higher up producing the order VS.

- (4) [TopP Top [Foc S Foc [Top TopVP]]]

Clitic – Past Participle Agreement (1d), according to Kayne’s (1989) and Belletti’s (2006) proposal, the clitic moves from the object position and it triggers agreement on the past participle endowed with number and gender features.

- (5) ____ Cl [____ AgrPstPart ... [vP V DP ...]]

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In the case of Subj. - Unacc. PastPart agreement complexity lies in the fact that unaccusative verbs have a direct internal argument, but no external argument. As in passive structures, the DP subject moves from its position merged as a sister of V, where it receives its thematic role, to SpecIP. In Italian the Past Participle of unaccusative verbs agrees in number and gender features with the subject.

(6) [IP [SpecIP___ [Aux [Agr/T [VP [V <DP[Theme]>]]]]]]

The following test was administered on an individual basis, in two different modalities: listening and reading; each child was taken to a quiet room, she/he was seated in front of a puppet -Teddy Bear- next to the experimenter. The task of the test was to help Teddy Bear to learn Italian. So children after listening to the sentences, one at a time, in a random fixed order, gave a grammaticality judgement of the sentences that the little bear said - or wrote, in the case of the reading modality -, and they had to provide also a correction of the sentence.

Agreement	Manipulated Conditions	Sentences
D/N	Fem. Sin. / Fem. Plur.	*Le mamma ha preparato la torta. (*The f.,plur mum f.,sing. has prepared the cake).
	Fem. Plur. / Fem. Sin.	* La bambine hanno chiuso la porta. (*The f.,sing. girls f.,plur have closed the door).
S/V	Masc. Sing. / Plur	* Il bambino hanno fatto i compiti. (*The child have done the homework).
	Masc. Plur / Sing.	* Gli abili pittori dipinge un quadro. (*The skilled painters paints a picture).
V/S	Indefinite subj.	*Arriva tre ragazze. (*Arrives three girls).
	Definite subj.	*Esce le principesse. (*Gets out the princesses).
	PP VP DP (definite subj.)	*Sulla poltrona dormono il nonno. (*On the armchair sleep the grandfather).
CL/PP	Masc. Plur. / Masc Sing	* La mamma li ha vestito. (*The mum them has dressed).
	Masc. Plur. / Fem. Sing.	*La nonna li ha preparata. (*The grandmother them has prepared).
	Masc. Sing. / Fem. Sing.	*Il ragazzo lo ha raccolto. (*The boy it/him m.,sing has picked up f., sing.).
S/Unaccusative PP	Fem. Plur./Fem. Sing.	*Le bambine sono caduta. (*The girls f.,plur.. are fallen down f.,sing).
	Fem. Plur. / Masc. Sing.	*Le ragazze sono uscito. (*The girls f.,plur. are got out m.,sing.).
	Fem. Plur./ Masc. Sing.	*Le maestre sono arrivati. (*The teachers f.,plur. are arrived m.,plur.).

Table 1: Syntactic conditions of the experiment.

Clitic Production

Morphosyntactic and syntactic competences were assessed also through a test of elicited production of 3rd person direct object clitics (Prévost et al. 2012).

The test comes as a Power Point presentation to administered on an individual basis and consists of a question-answer task based on pictures. The test items are meant to elicit the production of an object clitic while the fillers target the production of a reflexive clitic.

2.2 Participants

203 children took part in the experiment. All the children were recruited from three primary schools in the Milan area. Participants were divided into three groups:

- a. a control group (CG). 130 third and fourth graders (60 females), between 7;1 to 10;1 (M in months =106; SD in months= 8,0). 13 of them were bilingual: 8 L2 Arabic, 1 L2 Spanish, 2 L2 Chinese, 1 L2 Russian and 1 L2 Filipino. (90 children in listening modality, 40 in reading one).
- b. A group of children with developmental dyslexia (S)DD. 29 children, between suspected and diagnosed dyslexia¹, of third and fourth grade (12 females), age range 7;1-10;1 (M= in months 117; SD in months= 13). 17 children, of DD group, were indicated by the teachers as “suspected” (SD): they did not have an official diagnosis of dyslexia yet, but they showed significant difficulties in reading and their results in School’s Screening Tests² were below average. (18 children in listening modality, 11 in reading one).
- c. First graders’ group (FG)³. 44 children (21 females), between 5;7 - 6;9 (M in months =76,6; SD in months =3,4). The test was administered only in listening modality because the subjects were not able to read yet.

3. Results

In this section, data of the experiment will be reported and discussed. Firstly, results of agreement will be shown and then data on the production of object clitics.

As it is shown in figure number 1, agreement violations - in listening modality- were well-identified by CG and (S)DD, but FG showed more difficulties than other groups, surprisingly, with S-V agreement.

¹ Children were diagnosed through conventional tests (Prove-MT, Batteria per la Valutazione della Dislessia e della Disortografia Evolutiva (DDE), Wechsler Intelligence Scale for Children (WISC III)).

² School’s Screening Tests are made up of a test of phonemic fluency, of categorical fluency and of repetition of non-words. Tests are administered by teachers at the end of first grade- beginning of the second and, then, psychologists assess them.

³ This group is made up of children attending the first year of the primary school.

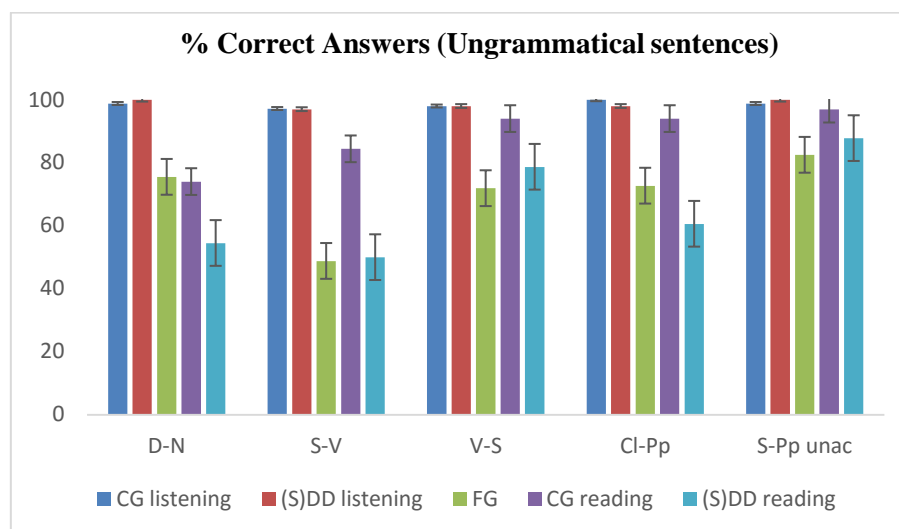


Fig. 1: Percentages of correct answers after listening and reading sentences with an agreement mismatch. Answers are sorted by type of agreement.

If we compare answers from the listening test with those of the reading test, a general worsening in the accuracy of the answers can be noticed. If, on the one hand, these results were expected from (S)DD, on the other hand, controls' results were completely unexpected. Interestingly, controls performed apparently poorly in the simplest agreement configurations: D/N and S/V. This worsening is due to the fact that children in the CG, while they were reading, corrected automatically the manipulated sentences, without identifying the agreement violation. E.g. a sentence like : *La bambine hanno chiuso la porta (The *sing. f.* girls has closed the door), was read: Le bambine hanno chiuso la porta (The *plur. f.* girls have closed the door).

As far as (S)DD, they show more difficulties in the reading modality than controls, as expected⁴. It may suggest that the problems of children with developmental dyslexia in the reading modality might be due to their reading impairment. Indeed, their reading time was decidedly longer than that of CG and they were more concentrated on the way they were reading to the detriment of the accuracy of grammatical judgements.

After identifying the agreement violation, each child had to try to correct the sentence he/she judged ungrammatical. Let's consider the sentence: *La nonna li ha preparata. The correction produced were sorted in:

1. Expected corrections (e.g. La nonna l'ha preparata).
2. Unexpected corrections, namely, the correction is acceptable and the violation is corrected but it is not what it was expected (e.g. La nonna le ha preparate)
3. Ungrammatical one: the correction is considered ungrammatical in general or for the purposes of the test (e.g. *La nonna ha preparate/ *La nonna ha preparato/ La nonna si è preparata).

⁴ Dyslexic children were tested in reading modality to assess how their impairment affects other language's domains.

The graph in figure 2 shows that the percentage of expected correction for Clitic-Past Participle agreement is lower if compared to other types of agreement by all three groups.

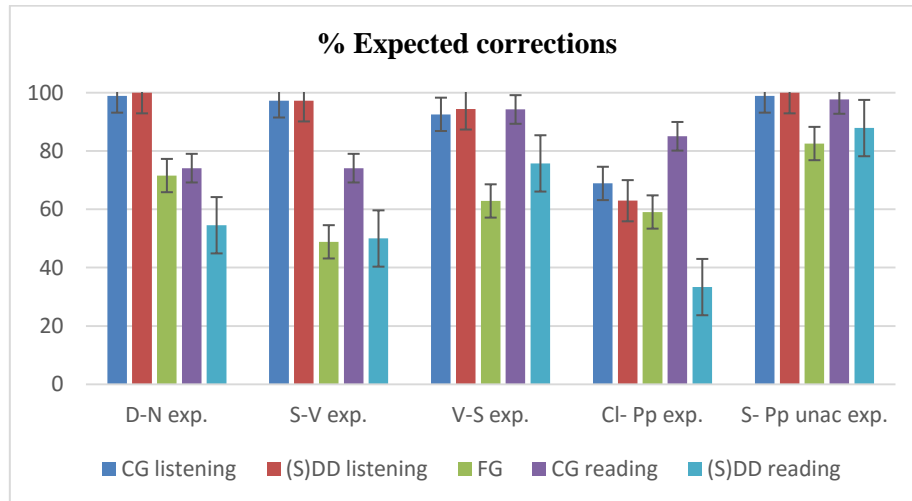


Fig. 2: Percentages of expected corrections for each agreement's configuration produced by each group.

As far as ungrammatical corrections, again, Cl-Pp seems to be the most complex configuration for all groups, in particular are concerned (S)DD.

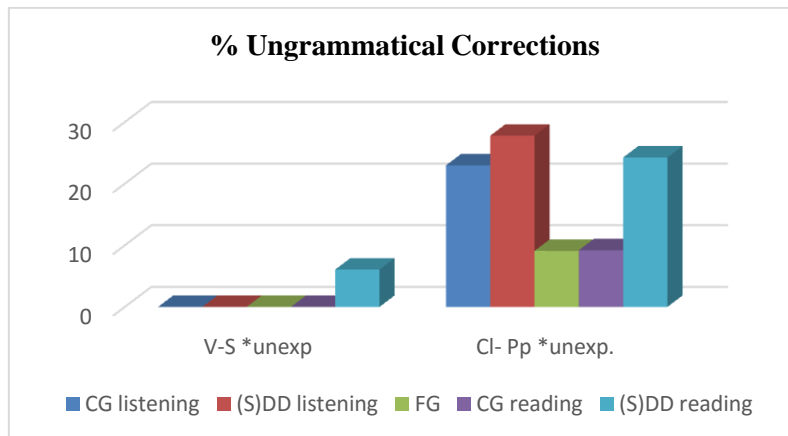


Fig. 3: Percentages of ungrammatical corrections for each agreement's configuration produced by each group.

Making a qualitative analysis of the ungrammatical corrections, the most common mistake in correcting sentences with Cl-Pp was the omission of the object clitic; while the error in V-S configurations was to rearrange constituents: V-S > S-V (E.g.: Escono le principesse/ Get out the princesses was corrected: Le principesse escono/ the princesses get out. Answers given after listening/reading correct sentences have provided interesting data:

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some children judged, anyway, some correct sentences as they were ungrammatical, as it is shown in figure 4.

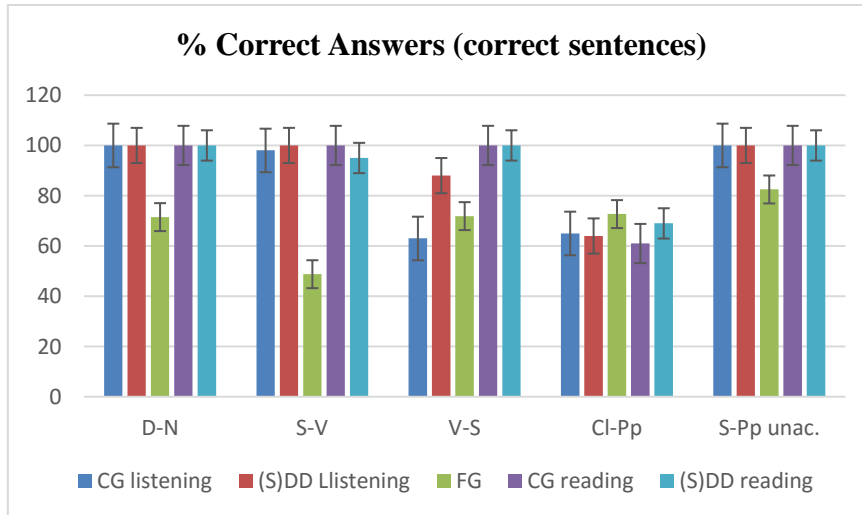


Fig. 4: Percentages of correct answers after listening and reading sentences without agreement mismatch. Answers are sorted by type of agreement.

The graph above shows that FG provide less correct answers than the other two groups; and, once again, agreement Cl-Pp has a lower percentage of correct answers for all three groups.

After each sentence (both grammatical and ungrammatical), children were asked to provide a correction if they judged the sentence ungrammatical. Grammatical sentences with Cl-PP were the most corrected (figure 5).

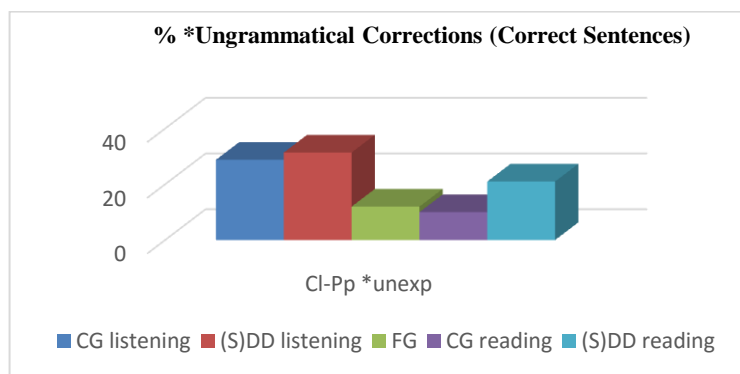


Fig. 5: Percentages of *unexpected corrections for Cl-Pp agreement produced by each group.

As for the production of object clitics, (S)DD produce less clitics than the other two groups and the most frequent errors were the production of a full DP or the object clitic's omission (Figure 6); while reflexive clitics were produced around 100%.

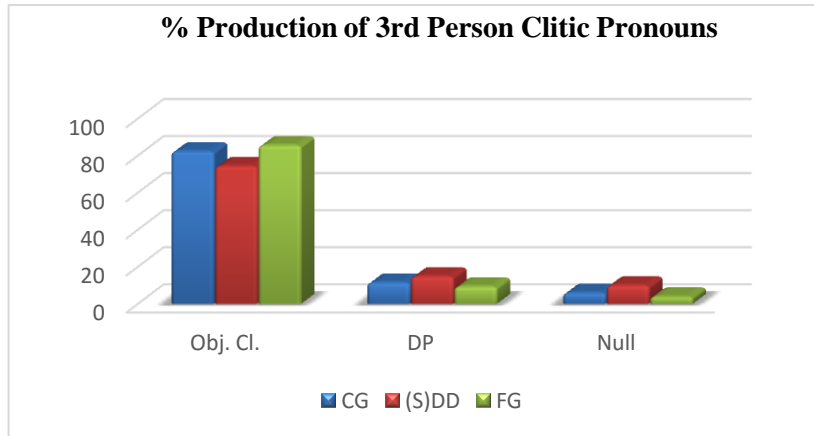


Fig. 6: Percentage of production of 3rd person clitic pronoun by children with DD, Controls and 1st graders.

In light of some unexpected data, an individual analysis of each group was made. It was noticed that, on the one hand, there were many children in the DD group who were quite skilled in producing sentences with clitics and in correcting violation on Cl/Pp; on the other hand there were also some children, in the DD group, who seemed really impaired in producing either no sentence with clitics or using clitics in just 20% of their sentences. So the match between the *unexpected correction in agreement case and the omission in the case of object clitics. Data of children, both in Control and (S)DD group, omitting more than 50% in the correction of Cl/Pp agreement and in elicitation task were selected (Figure 7).

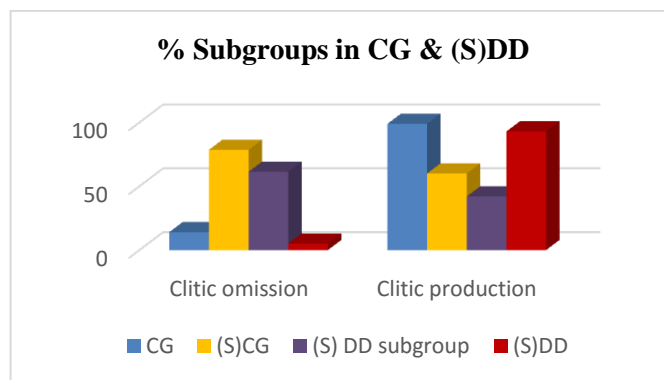


Fig. 7: Individual analysis, for CG and (S)DD, of omission of clitics in Cl/Pp agreement and of the object clitic in the test of production of third person clitic

4. Discussion

Clitics production is particularly interesting for Italian, as the failure to produce clitics has to be claimed a clinical marker of SLI (Bortolini et al. 2006, Arosio et al. 2010, 2014). Vender et al. 2014 have shown that object clitics omission discriminate between Early L2 individuals (EL2) and SLI children: the most frequent error displayed by EL2 children is producing an incorrect clitic, committing agreement errors, whereas SLI preschool children typically omit the pronoun.

On the basis of various findings (Jakubowicz et al. 1998, Arosio et al. 2010, 2014) it is hypothesized that a major source of difficulty for the production of object clitics lies in their syntactic and morphosyntactic complexity. Unlike full DPs, object clitics are realized in an uncanonical preverbal position that is associated to a non local thematic assignment. If we follow Belletti's (1999) analysis, the morphosyntactic operations required for overt case checking in clitics' production are more complex than case checking of a full lexical DP since the first has to move overtly in the syntax, while the second must not. Consequently, SLI children may be not able to realize the complex overt movement of the object clitic into AgrO and prefer to produce a full lexical DP or even omit the clitic.

Syntactic complexity of the object clitic arises both in the agreement case and in the third person clitic's production case. (S)DD children produced less clitics, in the elicitation task, than the other groups. However, not all dyslexic children behaved in the same way: making an individual analysis of the group, a subgroup of children was found that mastered almost perfectly each morphosyntactic configuration; however some children showed peculiar difficulties with structures with object clitics. Surprisingly, such difficulties have arisen even in a subgroup of CG.

5. Conclusions

In this study different aspects of morphosyntactic abilities in a group of children with developmental dyslexia were assessed. Targeting different morphosyntactic aspects (agreement and object clitics) in two different modalities (listening and reading), our study revealed in particular problems with Cl/Pp agreement and in object clitics production.

The individual analysis resulted in a distinction between children with only a reading impairment from those who may show comorbidity of both dyslexia and SLI. Moreover, this analysis has revealed a subgroup of children, also in the control group, that have shown similar results to a subgroup in the (S)DD group. These data might well indicate that some children both in the DD group and in CG presents a latent SLI syndrome that cannot be diagnosed using conventional tests. To conclude, a fine-grained linguistic analysis can be really useful to identify possible cases of atypical development.

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