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■ **ISBN 978-960-99486-7-8**

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International Conference of Greek Linguistics

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PRONOMINAL AND ANAPHORIC REFERENCE IN GREEK SPECIFIC LANGUAGE IMPAIRMENT

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ABSTRACT

Η παρούσα μελέτη εξετάζει την κατανόηση κλιτικών και αυτοπαθών αντωνυμιών στην Ειδική Γλωσσική Διαταραχή (ΕΓΔ). Παρουσιάζονται τα αποτελέσματα μιας δοκιμασίας επιλογής εικόνας, που χορηγήθηκε σε 14 ελληνόφωνα παιδιά με ΕΓΔ και σε δύο ομάδες ελέγχου 48 παιδιών τυπικής ανάπτυξης (ΤΑ). Τα παιδιά με ΕΓΔ παρουσίασαν έλλειμμα στην κατανόηση των αυτοπαθών αλλά όχι των κλιτικών αντωνυμιών σε συνθήκες συντακτικά απλών προτάσεων, ενώ τα παιδιά ΤΑ είχαν υψηλές επιδόσεις και στα δύο είδη αντωνυμιών. Σημαντικές δυσκολίες διαπιστώθηκαν στα παιδιά με ΕΓΔ αλλά και στα παιδιά ΤΑ στην κατανόηση των κλιτικών και όχι των αυτοπαθών αντωνυμιών σε συνθήκες συντακτικά σύνθετων προτάσεων.

Keywords: clitics, reflexives, *na*-clauses, secondary predicate constructions, specific language impairment, Greek

1. Introduction

Cross-linguistic research on the acquisition of pronominal and anaphoric reference has shown that while typically developing (TD) children do not have problems interpreting reflexive anaphors (*himself*, *herself*) (1), sometimes they erroneously allow strong pronouns (*him*, *her*) to co-refer with an inter-clausal antecedent (2) (Chien and Wexler, 1990; Grodzinsky and Reinhart, 1993). However, further research has revealed that children's interpretation of pronominal elements varies across sentence constructions; co-reference errors do not appear with quantificational antecedents (3) (Chien and Wexler, 1990; Philip and Coopmans, 1996; for a different view see Elbourne, 2005) or in cases where clitics are involved instead of strong pronouns (4) (Baauw, Escobar, and Philip, 1997; Escobar and Gavarró, 1999; McKee, 1992; Varlokosta, 1999/2000). Moreover, asymmetries have been observed in the interpretation of pronominals in simple contexts compared to more complex ones; while clitics are well-interpreted in simple transitive clauses (4), they are misinterpreted in Exceptional Case Marking (henceforth, ECM) contexts (5) (Baauw et al., 1997; Escobar and Gavarró, 1999; Hamann, Kowalski, and Philip, 1997; Varlokosta, 1999/2000). Erroneous interpretations in ECM contexts are evident in the case of strong pronouns as well (6), giving rise to a much stronger effect than the one reported for clitics (Philip and Coopmans, 1996). In contrast, reflexive anaphors tend to be well-interpreted across conditions, simple clauses (1) and ECM constructions (7).

- | | | |
|-----|--|---|
| (1) | Mum _i is washing <i>herself</i> _{i/*k} | [Child language: Mum _i is washing <i>herself</i> _{i/*k}] |
| (2) | Mum _i is washing <i>her</i> _{*i/k} | [Child language: Mum _i is washing <i>her</i> _i] |
| (3) | Every mum _i is washing <i>her</i> _{*i/k} | [Child language: Every mum _i is washing <i>her</i> _{*i/k}] |
| (4) | Gianni _i <i>lo</i> _{*i/k} asciuga
John him-cl dries
'John dries him' | [Child language: Gianni _i <i>lo</i> _{*i/k} asciuga] |
| (5) | La niña _i <i>la</i> _{*i/k} seca
the girl her-cl dry off
'The girl is drying her off' | [Child language: La niña _i <i>la</i> _i seca] |
| (6) | Mum _i sees <i>her</i> _{*i/k} dance | [Child language: Mum _i sees <i>her</i> _i dance] |

- (7) Mum_i sees *herself*_{i/*k} dance [Child language: Mum_i sees *herself*_{i/*k} dance]

Selective asymmetries in the interpretation of pronominal and anaphoric elements have been also reported for children with Specific Language Impairment (henceforth, SLI), a developmental language disorder, typically associated with normal non-linguistic cognitive abilities but severe difficulties in language comprehension and production (van der Lely, 1996; among others). However, the findings reported in the existing studies regarding the observed asymmetries in the interpretation of pronominals and reflexives are not always compatible. In particular, van der Lely and Stollwerck (1997) report that performance of their English-speaking SLI group on conditions with strong pronouns was worse compared to conditions with reflexives in the case of sentences with referential antecedents; the pattern was reversed in the case of sentences with quantificational antecedents, with reflexives presenting greater difficulties compared to strong pronouns. In contrast, in an online priming study, Hestvik, Schwartz, Tornyoova, Almodovar, Love, and Swinney (2007) observed good comprehension of pronouns by English-speaking SLI children who were impaired in structures derived by *wh*-movement. The authors argue that the deficit observed in SLI children concerns true movement relations and not pronominal/anaphoric relations, which are encoded at a non-syntactic level of representation. In a similar vein, Novogrodsky and Friedmann (2010) present evidence of intact performance regarding the interpretation of strong pronouns and anaphoric reflexives by their group of Hebrew-speaking SLI children, despite observed impairments of the group in the production and comprehension of structures derived by *wh*-movement (relative clauses and *wh*-questions). They also conclude that SLI children do not have difficulties with all kinds of syntactic dependencies (contra van der Lely, 1996; van der Lely and Stollwerck, 1997). Studies on the comprehension of pronominal clitics present controversial findings, as well. Jakubowicz, Nash, Rigaut, and Gérard (1998) do not observe difficulties regarding the interpretation of pronominal clitics in their group of French-speaking SLI children, who produced coreference errors in only 10% of the cases, whereas Varlokosta (2002) reports some difficulties regarding the comprehension of pronominal clitics in her group of Greek-speaking SLI children, who produced coreference errors 28% of the time. Great difficulties are observed by Varlokosta (2002) in the performance of her SLI cohort on strong pronoun conditions, where coreference errors were produced in 50% of the cases. In contrast, Stavrakaki and van der Lely (2010) report that their group of Greek-speaking SLI children present a deficit in the interpretation of pronominal clitics (55% correct performance) but not in the interpretation of strong pronouns (87.5% correct performance) or reflexives (100% correct performance). Last, an asymmetry in SLI children's interpretation of clitics in simple transitive sentences compared to complex contexts has been reported by Varlokosta (2002): whereas clitics are misinterpreted in simple transitive clauses, like (8), in 28% of the cases, they are misinterpreted 67% of the time in complex contexts that involve a secondary predicate construction (SPC), as in (9); interestingly, very few misinterpretations are found in complex contexts that involve a *na*-clause, as in (10), where coreference errors are observed in only 17% of the cases.

- (8) O Gufi_i *ton*_{*i/k} skepase
Goofy covered him
- (9) O Gufi_i *ton*_{*i/k} iðe ðemeno
Goofy saw him tied up
- (10) O Gufi_i *ton*_{*i/k} iðe na xorevi
Goofy saw him dance

It is apparent that the cross-linguistic findings regarding pronominal and anaphoric reference in SLI are inconclusive since it is not clear (a) whether the interpretation of strong pronouns presents greater difficulties compared to the interpretation of reflexives (van der Lely and Stollwerck, 1997 vs. Hestvik et al., 2007; Novogrodsky and Friedmann, 2010), and (b) whether the interpretation of clitics is unproblematic or less problematic compared to the interpretation of strong pronouns (Jakubowicz et al., 1998; Varlokosta, 2002 vs. Stavrakaki and van der Lely, 2010). Moreover, the findings of the two Greek studies concerning pronominal and anaphoric reference in SLI raise the following issues: (a) Is the comprehension of pronominal clitics less deficient compared to the interpretation of strong pronouns? (Varlokosta, 2002 vs. Stavrakaki and van der Lely, 2010); (b) Is the comprehension of pronominal clitics more deficient compared to the interpretation of anaphoric reflexives? (Stavrakaki and van der Lely, 2010); (c) Is the comprehension of clitics better preserved in simple contexts compared to complex contexts? (Varlokosta, 2002).

In the present study we address some of the above issues by investigating the comprehension of pronominal clitics and anaphoric reflexives in a group of 14 Greek-speaking SLI children with a picture selection task. In particular, we examine (a) whether the comprehension of pronominal clitics is more deficient compared to the interpretation of anaphoric reflexives in simple transitive clauses, and (b) whether performance on clitics becomes more deficient in complex structures that involve a *na*-clause or a SPC. Unlike Varlokosta (2002), where the SLI group was indirectly compared to TD children without strict matching procedures, we compare our SLI cohort to two control groups of TD children, one matched on language ability and one matched on chronological age.

2. The present study

2.1 Participants

The participants of the study were: Fourteen (14) monolingual Greek-speaking children with SLI (12 male), aged from 5;5 to 7;10 years (mean age: 6;2, SD: 0.77), and two control groups of TD children: (a) one group matched on language ability (LA) (n=28) on the basis of raw scores from a subset of the Diagnostic Test of Verbal Intelligence (DVIQ) (production of vocabulary) (Stavrakaki and Tsimpli, 2000), aged from 3;11 to 6;0 (mean age: 4;7, SD=0.65) (see Table 1); and (b) one group matched on chronological age (CA) (n=28), aged from 5;0 to 7;8 (mean age: 5;9, SD=0.87). Each SLI child was matched individually for language ability to two TD children (within 3 points of the DVIQ). The SLI and CA groups were matched individually for chronological age (within 6 months); there were no significant differences in chronological age between the two groups ($p > .1$). All children demonstrated a normal range of nonverbal IQ, in addition to hearing and spatial acuity preservation, no history of frank neurological impairment, no psychological or emotional disturbance, and none received any kind of medications.

SLI group	Age (years/month)	DVIQ scores (vocabulary)	LA group	Age (years/month)	DVIQ scores (vocabulary)
P1	6;0	18	TD1	4;9	16
			TD2	5;2	18
P2	6;3	18	TD1	4;5	17
			TD2	5;0	17
P3	6;0	19	TD1	4;4	19
			TD2	5;1	18
P4	5;5	23	TD1	5;1	20
			TD2	5;6	21
P5	7;7	23	TD1	5;2	20
			TD2	6;0	24
P6	7;3	23	TD1	4;4	20
			TD2	5;6	20
P7	7;10	17	TD1	5;4	17
			TD2	5;3	16
P8	6;4	15	TD1	4;5	15
			TD2	5;6	16
P9	5;2	14	TD1	3;11	11
			TD2	4;0	12
P10	5;8	14	TD1	4;2	15
			TD2	4;4	14
P11	5;9	16	TD1	5;0	15
			TD2	4;7	16
P12	6;4	16	TD1	4;1	16
			TD2	4;11	17
P13	5;10	14	TD1	4;4	12
			TD2	4;2	12
P14	5;5	14	TD1	4;0	12
			TD2	4;1	14

Table 1 Participants (SLI and LA): Age and DVIQ scores

2.2 Materials and procedure

A picture selection task was employed, which contained 40 clauses in 8 different conditions divided into simple and complex contexts: (i) simple contexts: referential antecedent with a clitic (11); referential antecedent with a reflexive (12); quantificational antecedent with a clitic (13); and quantificational antecedent with a reflexive (14); (ii) complex contexts: clitic in a *na*-clause (15); reflexive in a *na*-clause (16); clitic in a SPC (17); and reflexive in a SPC (18). Simple structures contained 6 sentences per condition, whereas complex structures included 4 sentences per condition.

- | | | |
|------|---|-------------------|
| (11) | <i>O babas ton zografizi.</i>
Dad is painting him (CL) | [simple context] |
| (12) | <i>O babas zografizi ton eafto tu.</i>
Dad is painting himself (RFL) | [simple context] |
| (13) | <i>Kathe babas ton zografizi.</i>
Every dad is painting him (QNT-CL) | [simple context] |
| (14) | <i>Kathe babas zografizi ton eafto tu.</i>
Every dad is painting himself (QNT-RFL) | [simple context] |
| (15) | <i>O babas ton ide na horevi.</i>
Dad saw him dance (<i>na</i> -CL) | [complex context] |
| (16) | <i>O babas ide ton eafto tu na horevi.</i>
Dad saw himself dance (<i>na</i> -RFL) | [complex context] |
| (17) | <i>O babas ton ide demeno.</i>
Dad saw him tied up (SPC-CL) | [complex context] |
| (18) | <i>O babas ide ton eafto tu demeno.</i>
Dad saw himself tied up (SPC-RFL) | [complex context] |

All participants were presented with two black and white cartoon pictures at a time in one page of A4 size, while they heard a test sentence that corresponded to one of these pictures. Participants then were asked to point to the correct picture. Test sentences always followed an introductory sentence to set the context. The pictures depicted two occasions: one which matched the spoken sentence (the *match*) and one which did not match the spoken sentence (the *mismatch*) (see Fig. 1 for an illustration of test sentence 11). All items were randomised across conditions. Fillers were also included and the order of the pictures (presented on the left or right side) was reversed across conditions, in order to avoid habituation effects. A few practice items were included prior testing in order to make sure that children were familiar with the procedure. Repetition of test sentences was allowed, when necessary. The task was administered within one session.

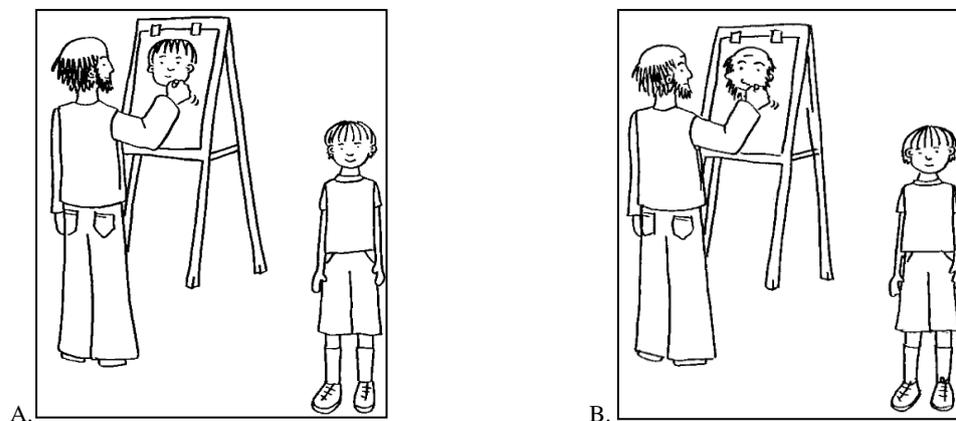


Fig. 1 Introductory sentence: *Ehume enan baba ce enan maθiti.* We have a dad and a student.
Test sentence: *O babas ton zografizi.* Dad is painting him.
Picture A: *match* (correct) / Picture B: *mismatch*

3. Results

Our data revealed that Greek-speaking SLI children have selective difficulties in the comprehension of clitics and reflexives. As it is shown in Table 2, pronominal and anaphoric reference in simple contexts does not cause difficulties to SLI and TD children given the relatively high scores of accuracy all groups attained (above 79%). However, although no asymmetries were observed between clitics and reflexives in simple contexts for both TD groups ($p > .1$), the SLI group performed significantly better on clitics (with a referential or a quantificational antecedent) compared to (a) reflexives with a referential antecedent ($\chi^2=8,513$, $p=.004$; *Cramer's V* = .225); and (b) reflexives with a quantificational antecedent ($\chi^2=10,573$, $p=.001$; *Cramer's V* = .251).

	CL	RFL	QNT-CL	QNT-RFL	na-CL	na-RFL	SPC-CL	SPC-RFL
SLI group	0,94 (0,23)	0,79 (0,41)	0,94 (0,23)	0,76 (0,42)	0,59 (0,49)	0,86 (0,35)	0,52 (0,50)	0,91 (0,28)
LA group	0,95 (0,21)	0,87 (0,33)	0,85 (0,35)	0,87 (0,33)	0,57 (0,49)	0,91 (0,28)	0,61 (0,49)	0,89 (0,31)
CA group	0,97 (0,17)	0,95 (0,21)	0,95 (0,22)	0,95 (0,21)	0,57 (0,49)	0,94 (0,24)	0,57 (0,49)	0,99 (0,09)

Table 2 Overall scores (mean/Sdv)

In contrast, the performance of all groups (SLI, LA, and CA) dropped significantly in the complex conditions (*na*-clause, SPC). Specifically, less accurate scores were obtained within all three groups in (a) *na*-clauses with clitics, compared to simple contexts with clitics (SLI group: $\chi^2=25,900$, $p=.000$; *Cramer's V* = .430; LA group: $\chi^2=60,952$, $p=.000$; *Cramer's V* = .467; CA group: $\chi^2=69,649$, $p=.000$; *Cramer's V* = .499); and (b) SPCs with clitics, compared to simple contexts with clitics (SLI group: $\chi^2=34,035$, $p=.000$; *Cramer's V* = .493; LA group: $\chi^2=52,964$, $p=.000$; *Cramer's V* = .435; CA group: $\chi^2=71,770$, $p=.000$; *Cramer's V* = .506). Selective asymmetries in the interpretation of clitics and reflexives were also observed within complex contexts; (a) clitics but not reflexives were misinterpreted in *na*-clauses (SLI group: $\chi^2=10,036$, $p=.002$; *Cramer's V* = .299; LA group: $\chi^2=33,595$, $p=.000$; *Cramer's V* = .387; CA group: $\chi^2=40,510$, $p=.000$; *Cramer's V* = .425); and (b) clitics but not reflexives were misinterpreted in SPCs (SLI group: $\chi^2=17,785$, $p=.000$; *Cramer's V* = .395; LA group: $\chi^2=24,381$, $p=.000$; *Cramer's V* = .330; CA group: $\chi^2=59,321$, $p=.000$; *Cramer's V* = .515).

Additionally, whilst no asymmetries were observed between the SLI and the LA group, reflexives were significantly better interpreted by the CA group compared to the SLI group in simple contexts with a referential antecedent ($\chi^2=16,811$, $p=.000$; *Cramer's V* = .258) and in simple contexts with a quantificational antecedent ($\chi^2=20,571$, $p=.000$; *Cramer's V* = .286).

4. Discussion

The present study investigated the ability of Greek-speaking SLI children to assign reference to pronominal clitics and reflexive anaphors in simple and complex constructions, and compared their performance to the performance of two control groups of TD children, one matched on language ability (LA) to the SLI cohort and one matched on chronological age (CA). Our results from TD children revealed that both control groups (LA and CA) performed high in all simple contexts, while they manifested difficulties with the comprehension of clitics in complex contexts, like *na*-clauses and SPCs. Our results regarding high performance on clitics and reflexives in simple contexts are in line with previous findings for Greek (Varlokosta, 1999/2000; 2002), as well as with cross-linguistic findings (Baauw et al., 1997; Escobar and Gavarró, 1999; Hamann et al., 1997; McKee, 1992), and indicate that TD children acquire reference assignment in simple contexts at an early age. Our results regarding low performance on complex contexts with clitics compared to simple contexts with clitics, as well as the asymmetry observed between complex contexts with clitics and complex contexts with reflexives are also compatible with previous cross-linguistic findings, where similar dissociations have been observed (Baauw et al., 1997; Escobar and Gavarró, 1999; Hamann et al., 1997; Varlokosta, 1999/2000; 2002).

Our results, however, revealed a pattern that was not manifested in previous research on Greek; unlike Varlokosta (1999/2000; 2002), where an asymmetry was observed between *na*-clauses and SPCs, with higher performance of TD children on *na*-clauses compared to SPCs, our findings revealed

similar difficulties regarding the interpretation of clitics in both complex contexts. One difference between this study and the previous studies lies in the choice of experimental task: while in the present study a version of the picture selection task was used, in Varlokosta (1999/2000; 2002), an act out version of the truth value judgment task was employed. The methodological difference between this study and the previous ones may have contributed to the observed differences in the results. We will not analyze further these differences, but for discussions regarding task effects, see Baauw and Zuckerman (2009), Conroy, Takahashi, Lidz, and Phillips (2009), and Sanoudaki and Varlokosta (2011). What is crucial for our purposes is the fact that the difficulties in the interpretation of clitics in complex structures observed in previous studies were replicated in this study as well, and, notably, that these difficulties appear to be persistent in TD children that are 7-year-old (compare with other studies where similar errors have been observed in younger TD children; 3;5 to 6;3 year-old children in Escobar and Gavarró, 1999; 3;6 to 5;10 year-old children in Varlokosta, 1999/2000; 2002). In six of the twenty eight children in the CA group, that were 6;10 to 7;8 (mean age: 7;3), coreference errors were observed 58% of the time in *na*-clauses with clitics and 62.5% of the time in SPCs with clitics. In contrast, performance of these children on *na*-clauses and SPCs with reflexives was 100% accurate. The errors observed in complex contexts with clitics have been attributed to overgeneralization of A-chains (Reinhart and Reuland, 1993) by children, a result that is due to incomplete lexical acquisition of the grammatical features of personal pronouns (Baauw et al., 1997; Philip and Coopmans, 1996). The idea is that children treat pronominal elements as [-R], instead of [+R], resulting in configurations that violate the Chain Condition (Baauw et al., 1997). This approach faces a number of problems, particularly if one takes into account the feature specification of Greek pronominals and reflexives (Nerantzini, Papadopoulou, and Varlokosta, 2011; Varlokosta, 2011). For the purposes of the present study, we will only point out that if one adopts the analysis of incomplete lexical acquisition of the grammatical features of personal pronouns as an explanation for the coreference errors observed in complex contexts with clitics, one has to maintain the idea that the grammatical features of pronouns are not acquired before the age of 8, an idea that seems quite odd and faces empirical problems as well (see Vasić, 2006).

Let us now turn to the findings for the SLI group. Regarding performance on clitics, similarly to the TD control groups, our SLI cohort performed very high on simple contexts. This finding is in line with previous studies that show spared interpretation of clitics by SLI children in simple constructions (cf. Jakubowicz et al., 1998), or less deficient interpretation of clitics compared to strong pronouns (cf. Varlokosta, 2002), but incompatible with studies that show deficient interpretation of pronominal clitics in SLI (cf. Stavrakaki and van der Lely, 2010). The spared interpretation of clitics in simple contexts indicates that (a) SLI children do not have a deficit related to the grammatical nature of object clitics (i.e. to the grammatical features they carry) (contra Tsimpli and Stavrakaki, 1999), and (b) SLI children do not have a deficit related to feature checking in syntactic dependencies that incur movement or chain formation, such as object clitics (contra Stavrakaki and van der Lely, 2010) (for evidence of unimpaired production of object clitics by SLI children, see Manika, Varlokosta, and Wexler, 2011). In contrast, the findings of this study are compatible with approaches arguing that SLI children do not have difficulties with all kinds of syntactic dependencies (cf. Novogrodsky and Friedmann, 2010).

Regarding reflexives, performance of our SLI group on simple contexts (in conditions with both referential and quantificational antecedents) was significantly worse compared to their performance on simple contexts with clitics. Moreover, performance of the SLI children on these conditions was significantly worse compared to performance of the TD children, particularly to the performance of the CA group, on the same conditions. Our SLI group's poor performance on reflexives provides evidence for atypical acquisition of anaphoric reference and is not fully compatible with findings reported in previous studies. It is not in line with findings reported in Stavrakaki and van der Lely (2010), where SLI children performed at ceiling on the reflexive condition (simple transitive clauses with a referential antecedent), and it is partly compatible with findings reported in van der Lely and Stollwerck (1997), where poor performance was observed on the reflexive condition with a quantificational antecedent but not on the reflexive condition with a referential antecedent. We conjecture that our findings indicate that sometimes SLI children have difficulties in accepting the correct antecedent within the relevant binding domain. Given that SLI children are known to exhibit processing limitations (Bishop, 1992; among others), these difficulties may be due to a general processing problem on the establishment of certain syntactic relations, particularly on the establishment of the bound reading. This line of explanation raises the question why a processing problem was not evident in the establishment of the bound reading in complex structures. We assume that the high performance of the SLI children in these constructions does not reflect a genuine bound reading interpretation, but is possibly a coreferential kind of reading, similar to that observed in complex structures with clitics. Although the source of the

coreferential reading in the case of complex structures is not obvious to us, it may be due to the different binding domains assumed by the children in these contexts compared to simple contexts.

To conclude, our study on the acquisition of pronominal and anaphoric reference in SLI showed that some of the asymmetries observed in the performance of TD children are also evident in the performance of SLI children, namely better performance on pronominal clitics in simple compared to complex contexts and better performance on anaphoric reflexives than pronominal clitics in complex contexts. However, differences were observed between the SLI and the two control groups of TD children in the interpretation of anaphoric reflexives in simple transitive clauses, indicating an atypical course of acquisition. It was argued that the findings of this study are not compatible with the view that SLI children have a deficit related to the grammatical nature of object clitics or to the feature checking operation through which the interpretation between object clitics and their referents is established, but support the view that SLI children do not have difficulties with all kinds of syntactic dependencies. The atypical performance of SLI children on anaphoric reflexives was attributed to a general processing problem on the establishment of the bound reading.

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