Clinical markers of specific language impairment and developmental dyslexia in Romanian: the case of Accusative clitics

Larisa Avram, Anca Sevcenco, Ioana Stoicescu

Abstract. This paper investigates whether 3rd person Accusative clitics represent a clinical marker which could distinguish between specific language impairment and developmental dyslexia in Romanian. The results of an elicited production task and those of a sentence repetition task show that non-reflexive 3rd person Accusative clitics are problematic with both developmental dyslexia and SLI, but clearly more vulnerable with the latter. The omission rate as well as the avoidance strategies used in the two deficits are different, offering a possible discriminating criterion. It is argued that these pronominals are plausible candidates to the list of clinical markers for both language deficits and that they can help distinguish between the two.

Keywords: Accusative clitics, developmental dyslexia, SLI, Romanian

1. Introduction

Accusative clitics have been identified as a vulnerable domain in the acquisition of L1 by typically developing children. Object clitic omission in the early stages of child language has been reported for several languages, among which French (Jakubowicz et al. 1996, Hamann 2002, Pîrvulescu 2006), Italian (Schaeffer 2000, Bedore and Leonard 2001), Modern Greek (Tsimpli and Mastrovaplou 2010), Spanish (Reglero and Ticio 2003, Castilla and Perez-Léroux 2010), Bulgarian (Ivanov 2008), Polish (Tryzna 2010), Romanian (Avram 2001a).

1Work on this paper was financed by grant 135295-LLP-1-2007-1-UK-KA1SCR for the research project Crosslinguistic Language Diagnosis (CLAD).
Recent research in the domain of language development has compared data from typically developing (TD) children with performance data from Specific Language Impairment (SLI). SLI, also known as developmental dysphasia, is a genetic disorder in the domain of language, in the absence of any mental, neurological, auditory, attentional or emotional limitations (Leonard 1998). Very often, the domains which are vulnerable in the acquisition of L1 by TD children have been found to be even more vulnerable in the case of SLI children. This has been the case with pronominal clitics as well. Low production rate of Accusative clitics has been argued to characterize SLI in several languages (among which French – Jakubowicz et al. 1998, Hamann et al. 2003, Tuller et al. 2011, Italian – Leonard 1998 and all the relevant references therein, Bortolini et al. 1997, Arosio et al. 2012, Spanish – Bedore and Leonard 2001, Modern Greek – Tsimpli and Stavrakaki 1999, Stavrakaki et al. 2011). The data indicate that if in a language clitics are a vulnerable domain for language acquisition by TD subjects they seem to be a vulnerable domain for SLI as well.

A non-trivial clinical issue is that SLI diagnosis interferes with developmental dyslexia, a language disorder which results, among other deficits, in impaired acquisition of reading, despite normal IQ and adequate schooling, in the absence of any mental, auditory, attentional or emotional limitations, or socio-economic problems. It often runs in families, which indicates that its cause might include a genetic component (Pennington 1991). One of the main reasons for which diagnosis of the two language impairments may interfere is that reading remains an area of risk with many SLI children. Therefore reading deficits may indicate both disorders. To make differential diagnosis even more difficult, some linguistic markers of the two deficits overlap. Both children with SLI and children with developmental dyslexia fall behind their age peers on tasks measuring speech perception, knowledge of morpho-syntax, and phonological processing. Subject verb agreement, for example, is impaired both in SLI and in developmental dyslexia (Rispens and Been 2007). Past tense marking is another impaired area across the two deficits (Joanisse et al. 2000, Jakubowicz 2006). Production of relative clauses...
is yet another possible common linguistic marker (Avram et al. 2012b, Sevcenco et al. 2012).

Until recently, however, there has been little contact between research in SLI and research in developmental dyslexia, in spite of the linguistic similarities between the two deficits. Generally, SLI has been argued to be more severe. But more recent studies have revealed a range of clinical variation between the two deficits, which cannot be accounted for in terms of severity alone (see, for example, Bishop and Snowling 2004).

2. Aim

The linguistic profile of SLI and developmental dyslexia in Romanian are almost unknown (see, however, Avram et al. 2011, 2012b, Sevcenco et al. 2012, Stoicescu et al. this volume) and there are very few reports with respect to knowledge of object clitics in any of these two deficits (Avram and Sevcenco 2011, Avram et al. 2012a). The present study aims at contributing to the identification of linguistic markers which can distinguish between SLI and developmental dyslexia in Romanian. In particular, it addresses two main questions:

(i) are those pronominal clitics which are delayed in the acquisition of L1 Romanian by TD children possible clinical markers of SLI and/or developmental dyslexia?

(ii) is there any relevant difference between the production of Accusative clitics in the two deficits which might contribute to differential diagnosis?

We compare the performance of SLI and dyslexic children to that of TD children of similar chronological age on the basis of experimental data. Identical methods and materials are used with all the groups of subjects.
The remainder of the paper is organized as follows. In Section 3 we briefly present the main properties of 3rd person Accusative clitics in Romanian, with focus on those properties which are directly relevant for the present study. Section 4 addresses the status of these clitics as possible clinical markers of SLI and developmental dyslexia in Romanian on the basis of experimental data. We argue that Accusative clitic production may represent a clinical marker of both SLI and developmental dyslexia and that it might also help differential diagnosis. Section 5 summarizes the main findings.

3. Romanian Accusative clitics in a nutshell

Romanian Accusative clitics evince the set of properties standardly associated with Romance clitics in general (Kayne 1975, Cardinaletti and Starke 1999). They are deficient, weak pronominals which cannot occur in isolation, cannot receive focal stress, and cannot be conjoined. Unlike strong personal pronouns which show a bias towards [+human] referents, Romanian 3rd person Accusative clitics can refer to both human and non-human entities. On a par with 3rd person Accusative clitics in other Romance languages, they are homophonous with the article, as illustrated in Table 1:

<table>
<thead>
<tr>
<th>Article</th>
<th>Singular</th>
<th>Plural</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>masc.</td>
<td>fem.</td>
</tr>
<tr>
<td>Indefinite</td>
<td>o</td>
<td></td>
</tr>
<tr>
<td>3rd person Acc clitic</td>
<td>-l</td>
<td>o</td>
</tr>
</tbody>
</table>

As can be seen, the feminine singular clitic differs from all the other clitics in that it is homophonous with the indefinite article, not with the definite one. And it also differs with respect to distribution. In Romanian, Accusative clitics, like their counterpart in various other Romance languages, occur in pre-verbal position in finite constructions:
(1)  \(L-\)  am desenat.
    clitic \(\text{ACC 3RD SG MASC}\) have drawn
    ‘I have drawn him.’

The feminine clitic \(o ‘her’, however, is the only one which occurs
in pre-verbal position with some finite temporal-aspectual forms (2)
but in post-verbal position with several periphrastic finite forms,
among which the \textit{perfect-compus} (the equivalent of the French \textit{passé
composé}) (3), the conditional (4), and the presumptive (5):

(2)  \(o\)  vede
    clitic \(\text{ACC 3RD SG FEM}\) sees
    ‘He/she sees her.’

(3)  a văzut -o
    has seen clitic \(\text{ACC 3RD SG FEM}\)
    ‘He/she has seen her.’

(4)  ar vedea-o
    aux see clitic \(\text{ACC 3RD SG FEM}\)
    ‘He/she would see her.’

(5)  o fi iubind -o
    aux be love \(\text{GERUND}\) clitic \(\text{ACC 3RD SG FEM}\)
    ‘(S)he might love her.’

Romanian is a language which has clitic doubling constructions.
In this context, Accusative clitics are obligatory only when their
double, preceded by the preposition \textit{pe}, traditionally analysed as a
case marker, is a definite pronoun (6a), but optional with any other
direct object preceded by \textit{pe} (6b):

(6)  a. *(L-)* am desenat pe el/ pe acesta.
    clitic \(\text{ACC 3RD SG}\) have drawn PE he/ PE this
    ‘I have drawn him/this one.’

b.  (L-)* am desenat pe Ion/ pe copil/pe un prieten.
    clitic \(\text{ACC 3RD SG}\) have drawn PE Ion/PE child/ PE a friend
    ‘I have drawn Ion/the child/a friend.’
Using an Accusative clitic is pragmatically felicitous when the antecedent has been previously mentioned (7a). In this case, however, the full lexical DP can be used, which results in a grammatical but pragmatically inappropriate answer to the question (7b). If neither the clitic nor the lexical DP is used, the sentence is ungrammatical (7c).

(7) A: Ce-ai făcut cu cartea de bucate?
   ‘What have you done with the cookbook?’
a. B: Am pus -o pe raft.  
   have put clitic\text{ACC,3RD,FEM,SG} on shelf.
   ‘I have put it on the shelf.’
b. B: ??Am pus cartea de bucate pe raft. 
   have put cookbook.the on shelf
   ‘I have put the cookbook on the shelf.’
c. B: *Am pus pe raft.  
   have put on shelf

4. Accusative clitics as linguistic markers of SLI and dyslexia

4.1 Preliminary remarks

Previous acquisition studies provide both longitudinal and experimental data which reveal that 3\textsuperscript{rd} person Accusative clitics are randomly omitted during the early stages of the acquisition of language by TD children in Romanian (see, for example, Avram 2001a, b). Since the domains which are delayed – Accusative clitics included – in the acquisition of language by TD children are often markers of SLI (see, for example, Rice et al. 1995), we can hypothesize that 3\textsuperscript{rd} person Accusative clitics may be clinical markers of SLI in Romanian as well\textsuperscript{2}. This prediction seems to be borne out by

\textsuperscript{2} Actually, even if Accusative clitics were used target-like from the very beginning by TD children it would still make sense to investigate their use by SLI children. If Accusative clitics were not omitted by TD children but were significantly delayed in the acquisition of language by SLI children, it would be even more obvious that they represent linguistic markers for SLI (Ianthi Maria Tsimpli p.c.).
the data (Avram and Sevcenco 2011). However, as already mentioned, some of the linguistic markers of SLI have been shown to overlap with those of developmental dyslexia. The main aim of the present experimental study is to investigate whether Accusative clitics can be listed as linguistic markers of SLI and/or developmental dyslexia in Romanian.

4.2 Materials and procedure

The same elicited production task (inspired from Schaeffer 2000)\(^3\) was used with all the participants in the study. The task elicited the production of 3\(^{rd}\) person Accusative clitics by requiring a response to a question of the type illustrated in (8) and (9), in which the antecedent of the clitic was used, in relation to a drawing/a set of drawings in a powerpoint presentation on a computer screen.

\[\begin{align*}
(8) & \quad \text{Ce-a făcut X cu Y?} \\
& \quad \text{‘What did X do with Y?’}
\end{align*}\]

\[\begin{align*}
(9) & \quad \text{Ce face X cu Y?} \\
& \quad \text{‘What is X doing with Y?’}
\end{align*}\]

The presence of the antecedent in the elicitation question narrowed down the range of possible appropriate answers. Only an answer containing the clitic was both grammatical and pragmatically felicitous.

The task contained 2 warm-ups, 16 test items and 4 fillers. In 8 elicitation questions the present tense, which elicited clitics in pre-verbal position, was used (as in 9). In the other 8 elicitation questions the periphrastic past tense, with an auxiliary and a past participle, was used (as in 8). In the latter case, the elicited clitic was either in pre- or post-verbal position, depending on its gender features. The referents for clitics included humans, objects and animals. (10) below illustrates one test item:

\[\text{(10)}\]

\(^3\)This task was designed as part of research within the CLAD project. We thank Teresa Guasti for her generous help with the design and the materials used in the task.
The four fillers elicited pre-verbal reflexive clitics.


The results were compared to those obtained in a repetition task (the Romanian adaptation of the English GAPS\(^4\), Gardner et al. 2006), which contained two parts. The first one focused on knowledge of morpho-syntax; the participants were asked to repeat 11 sentences which contained various morphological markers and syntactic structures associated with delayed acquisition in the case of TD children and/or with SLI markers in languages for which one has a linguistic profile of the deficit (e.g. definite and indefinite articles, reflexive and non-reflexive Accusative clitics, Dative clitics, double object constructions, \(wh\)-questions). In the second part of the task, the participants were asked to repeat 8 nonce words which contained consonant clusters of various degrees of difficulty, placed in word-initial, word-medial and word-final position (see Avram et al. 2011 for a short description of the test). It is of direct relevance for the present study to mention that the sentence repetition task included 3 sentences which contained a 3\(^{rd}\) person Accusative clitic (two in pre-verbal and one in post-verbal position).

The SLI and the dyslexic children were tested individually by a linguist and a speech therapist at the language centre where they had

\(^4\) The GAPS test was adapted to Romanian within the ‘Crosslinguistic Language Diagnosis’ (CLAD) project.
been diagnosed and where they were in therapy. The TD controls were tested individually at various kindergartens or schools, in a quiet room, by two experimenters. The answers were recorded on specially designed answer sheets and also audio recorded for double-checking.

4.3 Accusative clitic production: a linguistic marker of SLI?

4.3.1 Participants

The participant groups included 6 SLI children and 6 chronological age-matched TD children, as summarized in Table 2.

Table 2. SLI participants and age-matched TD controls

<table>
<thead>
<tr>
<th>Group</th>
<th>Age range (months)</th>
<th>Mean age (SD)</th>
<th>Nr of participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLI children</td>
<td>72-123</td>
<td>103.5 (20.0673)</td>
<td>6</td>
</tr>
<tr>
<td>Age-matched TD controls</td>
<td>71-124</td>
<td>103.8 (20.9610)</td>
<td>6</td>
</tr>
</tbody>
</table>

The SLI children were selected by speech therapists in various language centres. Inclusion criteria were general delay in language

---

5 The number of SLI participants is, indeed, very low. This may be due to the fact that the exact linguistic profile of SLI for Romanian is yet unknown; therefore the identification of children with or at risk of SLI is still difficult. On the other hand, most speech therapists told us that they encountered very few cases of developmental dysphasia. This might be accounted for in terms of the morpho-syntactic properties of Romanian, a language with rich morphology. It has been noticed that in languages with rich morphology the rate of identified SLI children is, generally, lower (Leonard 1998).

6 The participants were diagnosed by speech therapists in language centres in Bucharest. Their results in a repetition test which was used prior to the clitic production task also indicated that they matched the linguistic profile of SLI. We are grateful to the following speech therapists: Sorina Niculescu, Viorica Oprea and Valeria Păruşan for their help with the SLI subjects. Thanks are also due to Eva Bartok from Tîrgu-Mureş, who helped us to get in touch with several speech therapists from Bucharest.
development (expressive or/and receptive language) and age-level non-verbal ability (measured on Raven’s Progressive Matrices test). The control group was selected from two kindergartens and one school in Bucharest. Parents’ consent was obtained for both groups.

In order to get a better picture of how the results of the SLI group compare to those of TD children of various ages, the results were compared to those obtained in an identical experimental setting with a group of 38 TD children (age range 33-85 months) (as summarized in Table 3):

Table 3. TD control participants of various age groups

<table>
<thead>
<tr>
<th>Age range (months)</th>
<th>Mean age (SD)</th>
<th>Nr of participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>33-48</td>
<td>42.25 (3.9)</td>
<td>16</td>
</tr>
<tr>
<td>59-71</td>
<td>68 (3.5)</td>
<td>9</td>
</tr>
<tr>
<td>72-85</td>
<td>75.85 (4.3)</td>
<td>13</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>38</td>
</tr>
</tbody>
</table>

4.3.2 Results

The results, summarized in Figure 1, reveal a significant difference between the SLI group and the age-matched TD control group:

Figure 1. Clitic production: SLI and age-matched TD controls
The production rate is significantly higher for the age-matched TD children than for the SLI children, whose production rate is extremely low. The production rate is almost at ceiling with the TD control group (90.62%), but below chance with the SLI children (44.79%). There was practically no omission with the TD children (1%) but the omission rate was significant with the SLI group (36%), where there is an obvious asymmetry between clitic omission in pre- and post-verbal position. The analysis of individual results shows that some of the SLI subjects produced exclusively post-verbal clitics. For example, I. (105 months) produced one single clitic (11), M. (123 months) only two clitics (12) and V. (122 months) only four clitics, but all in post-verbal position (13):

(11) a reparat-o. has repaired clitic_{ACC 3RD FEM SG} ‘He has repaired it.’ (I. 105 m.)
(12) a mîncat-o has eaten clitic_{ACC 3RD FEM SG} ‘It has eaten it up.’ (M. 123 m.)
(13) a spart-o has broken clitic_{ACC 3RD FEM SG} ‘He has broken it.’ (V. 122 m.)

Overall, the 6 SLI subjects omitted the Accusative clitic in 34 answers, out of which 33 were structures which required pre-verbal clitics.

A comparison of the clitic production rate of the SLI group (mean age 8;6) and the larger group of younger TD children reveals that the former performed at a level which was much lower than the one of the youngest age group of TD children, i.e. there is a significant delay in Accusative clitic production with the SLI group (see Table 4).

The qualitative analysis of the data reveals a 10.4% agreement error rate with the SLI subjects. No agreement errors are attested within the age-matched TD control group.
Table 4. Accusative clitic production: SLI children vs. TD children

<table>
<thead>
<tr>
<th>Group</th>
<th>Age range (months)</th>
<th>Mean age (SD)</th>
<th>AC production (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLI (6)</td>
<td>72-123</td>
<td>103.5 (20.0673)</td>
<td>36%</td>
</tr>
<tr>
<td>TD (16)</td>
<td>33-48</td>
<td>42.25 (3.9)</td>
<td>75.78%</td>
</tr>
</tbody>
</table>

Avoidance of clitic production does not result in ‘lexical DP instead’, a strategy which is not adopted by either the SLI or the age-matched TD control group. For the former we obtained only 3 responses in which a lexical DP was used instead of the pragmatically appropriate clitic; for the control group we obtained only 4 such answers. The strategy is not attested in the sentence repetition task either, where only one of the SLI subjects used a lexical DP instead of the clitic:

(14) Experimenter: Cine-a răsturnat -o ?

who has tipped. over- cliticACC 3RD FEM SG
‘Who has tipped it over?’

---

7 Our results differ from the ones reported for SLI children with L1 Italian on the basis of a similar task. Arosio et al. (2012) report that their SLI subjects produced clitics 50% of the time, but when they did not produce clitics they used the full DP instead (31%), i.e. a grammatical structure. Bortolini et al. (2006), on the other hand, report a high clitic omission rate with Italian SLI subjects. Such apparently contradictory data seem to indicate that the linguistic profile of SLI children might not be homogeneous (see also the differences observed within our small group of SLI subjects). On the other hand, the different results could also be correlated with different types of data used in the analysis. For French, one finds a situation which resembles the one for Italian mentioned above. Hamann et al. (2003) report – on the basis of spontaneous language data – findings similar to the ones of Arosio et al. (2012). The French SLI in their study showed a strong tendency to use the full DP instead of the clitic (68%); the omission rate was low (11%). Grüter (2005) offers a different picture for French SLI, building on data coming from an elicited production task: a low rate of responses with a full DP used instead of the clitic (16.5%) and a high rate of omissions (67%).
It is important to mention that the profile of the 6 participants diagnosed with SLI is not homogeneous. Four are older, the age range being in their case between 105-123 months. The other two are younger, 72 and 88 months, respectively. The result pattern of the two groups was different both in the elicitation task and in the sentence repetition task. Remember that the sentence repetition task included 3 sentences which contained a 3rd person Accusative clitic (2 in pre-verbal and 1 in post-verbal position). The individual results are presented in Table 5, where we indicate the overall number of correct answers in the sentence repetition task which tested knowledge of morpho-syntax (GAPS-MS), the number of produced Accusative clitics (GAPS-ACs) in this repetition task, and the number of produced clitics in the elicitation task:

Table 5. SLI group: Accusative clitic production across tasks

<table>
<thead>
<tr>
<th>Child</th>
<th>Age (months)</th>
<th>GAPS-MS (max. 11)</th>
<th>GAPS-ACs (max. 3)</th>
<th>Elicitation task (max. 16)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>105</td>
<td>2</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>MT</td>
<td>123</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>V</td>
<td>122</td>
<td>6</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>C</td>
<td>111</td>
<td>6</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>TC</td>
<td>72</td>
<td>9</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>PT</td>
<td>88</td>
<td>8</td>
<td>3</td>
<td>14</td>
</tr>
</tbody>
</table>

8 The score of the age-matched TD control group in the sentence repetition task ranged between 10 (for the two younger children) and 11 (for the four older children). No Accusative clitic was omitted in this task by the TD control group.
As can be seen in Table 5, the four older SLI children gave a lower number of correct answers in the sentence repetition task than the two younger SLI children (TC and PT). The latter managed to produce all the Accusative clitics in the sentence repetition task.

Their performance in the clitic production task was also different. The older group produced clitics at a lower rate (26.56%). One of the two younger children, TC, produced 12 clitics (out of 16) but she made many agreement errors: 7 of her 12 produced clitics did not have the appropriate \textit{phi}-features:

(15) a. Experimenter: Ce-a făcut Mickey Mouse cu maşina ?
\begin{quote}
‘What did Mickey Mouse do to the car ?’
\end{quote}
\begin{align*}
\text{Child: } & *L
\end{align*}
\begin{align*}
\text{clitic}_{\text{ACC 3RD MASC SG}} & \text{ has repaired and is ready}
\end{align*}
\begin{align*}
\text{[car = feminine]}
\end{align*}

b. Experimenter: Ce-i face fetiţa girafei ?
\begin{quote}
‘What is the girl doing to the giraffe ?’
\end{quote}
\begin{align*}
\text{Child : } & *Îl
\end{align*}
\begin{align*}
\text{clitic}_{\text{ACC 3RD MASC SG}} & \text{ washes}
\end{align*}
\begin{align*}
\text{[giraffe = feminine]}
\end{align*}
\begin{quote}
‘She is washing it.’
\end{quote}

In spite of the relatively good results in both the sentence repetition task and in the clitic production task, TC makes errors which indicate that she has a language deficit whose profile could be that of SLI. In a picture story description task, she made random gender and number errors with clitics, articles (16b-d)\footnote{Gender and number agreement errors with object clitics have also been reported for Spanish SLI children (Bedore and Leonard 2001, De la Mora et al. 2004).} and with pronouns and numerals (16a); she also used the Accusative marker preposition \textit{pe} erroneously where it was not required (16e):

(16) a. sunt *\text{două} pri doi prieteni, *\text{una} [ ]
\begin{quote}
‘are two\text{FEM} frie two\text{MASC} friends\text{MASC} one\text{FEM} [ ]’
\end{quote}
cu un singur ochi și *una cu *două ochi.
with a single eye and one FEM with two FEM eyes MASC
‘There are two friends, one with one single eye and one
with two eyes.’
b. *îl sperie pe *cea verde.
critic ACC. MASC SG frightens PE the one FEM green
‘He is frightening the green one.’
c. Am luat- *o și colacul meu.
have taken critic ACC FEM SG and life-belt MASC my
‘I have taken my life-belt as well.’
d. O prințesă pe care *le place prințul.
a princess SG PE whom critic ACC PL likes prince the
‘A princess whom the prince likes them.’
e. Un dragon *pe care face multe flăcări.
a dragon PE who makes many flames
‘A dragon who makes many flames.’

The qualitative analysis of the data reveals that not all the clitics are
equally vulnerable. No subject, SLI or TD, omitted the 3rd person
singular reflexive clitic *se in the sentence repetition task or in the
answers to the fillers in the clitic production task 10. One of the SLI
participants (I.) occasionally used the reflexive instead of the non-
reflexive 3rd person clitic 11:

(17) a. Experimenter: Ce-i face fetița girafei ?
‘What is the girl doing to the giraffe?’
Child :       *Se spele.
reflexive clitic 3RD SG wash SUBJ 3RD SG

10 In this respect, SLI and dyslexic children behave like TD children who might
occasionally omit 3rd person Accusative clitics during an early stage but they produce
reflexive clitics almost target-like immediately after emergence (Coene and Avram
2012). Arosio et al. (2012) also report that Italian SLI, dyslexic and TD children
perform well on reflexive clitics.

11 Notice that I. also uses the subjunctive (with the omission of the subjunctive marker
să) instead of the indicative form of the verb. This may reflect a delayed optional
infinitive stage (as suggested by Rice et al. 1995); Avram and Coene (2008) argue that
for child Romanian the equivalent of the optional infinitive is the bare subjunctive.
b. Experimenter: Ce-i face băiatul hipopotamului ?
   ‘What is the boy doing to the hippopotamus ?’
Child: *Se șteargă.
      reflexive clitic_{3RD SG} wipe.dry_{SUBJ3RD SG}

4.3.3 Interim summary

The comparison of the results obtained by the SLI and the TD participants indicates that non-reflexive 3rd person Accusative clitics may be vulnerable in the case of SLI Romanian-speaking children, who omit clitics at a higher rate and for a longer period of time than their age-matched TD controls (see also Avram and Sevcenco 2011). The SLI participants in our study omitted pre-verbal Accusative clitics at a significantly higher rate than Accusative clitics placed in post-verbal position. Some SLI participants produced Accusative clitics at a high rate but the clitic had the wrong phi-features. The data suggest that 3rd person singular Accusative clitics are a possible clinical marker of SLI in Romanian; pre-verbal 3rd person Accusative clitics are more vulnerable than post-verbal ones. Low rate of Accusative clitic production and/or a significant number of agreement errors with 3rd person Accusative clitics may be two of the linguistic indicators of SLI in Romanian.

4.4 Accusative clitic production: a linguistic marker of developmental dyslexia?

4.4.1 SLI and/or developmental dyslexia?

As mentioned in section 1, some of the linguistic markers of SLI overlap with those of developmental dyslexia. Since the linguistic profile of either SLI or developmental dyslexia in Romanian is not yet well defined, it is essential that one should investigate each linguistic marker in both deficits, in order to identify possible differences. This is why we compared the results of the SLI participants in the study to those of a group of children with developmental dyslexia.
4.4.2 Participants

The participant groups included 25 dyslexic children and 25 age-matched TD children, as summarized in Table 6. The dyslexic children were selected by speech therapists in various language centres in Bucharest\(^{12}\). Inclusion criteria were age-level non-verbal ability and delay in reading. The control group of TD children was selected from two kindergartens and one school in Bucharest\(^{13}\). Parents’ consent was obtained for both groups.

Table 6. Clitic production: Dyslexics and age-matched TD controls

<table>
<thead>
<tr>
<th>Group</th>
<th>Age range (months)</th>
<th>Mean age (SD)</th>
<th>Nr of participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dyslexics</td>
<td>84-148</td>
<td>107.76 (18.94131)</td>
<td>25</td>
</tr>
<tr>
<td>Age-matched TD controls</td>
<td>76-150</td>
<td>107.76 (18.9567)</td>
<td>25</td>
</tr>
</tbody>
</table>

Just like in the case of the SLI participants, in order to get a better picture of how the results of the dyslexic group compare to those of TD children of various ages, the results were compared to those obtained in an identical experimental setting with 38 TD children (age range 33-85 months) summarized in Table 3 above.

For the sentence repetition task, we obtained relevant responses from only 21 dyslexic participants (the other 4 gave a significant number of non-relevant answers and were excluded from the analysis). The data are presented in Table 7:

---

\(^{12}\) We thank the following speech therapists from Bucharest for their help: Valeria Balaban (CLI 6), Beti Cioacă (CLI 4), Cristina Georgescu (CLI 1), Cristina Grigore (CLI 6), Sofia Manuela Ivan (CLI 2), Sorina Niculescu (CLI 1), Mihaela Prunaru (CLI 3), Valeria Pârșan (CLI 7), Luiza Vasilescu (CLI 1).

\(^{13}\) We also thank the teachers and the children of School nr. 197 and Kindergarten Nr. 203 from Bucharest.
Table 7. Repetition task: Dyslexics and age-matched TD controls

<table>
<thead>
<tr>
<th>Group (number of participants)</th>
<th>Mean age (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dyslexics (21)</td>
<td>109.33 months (17.88388)</td>
</tr>
<tr>
<td>Age-matched TD controls (21)</td>
<td>109.33 months (19.61207)</td>
</tr>
</tbody>
</table>

4.4.3 Results

The results, summarized in Figure 2, reveal a significant difference between the dyslexic group and the age-matched TD control group with respect to clitic production rate (t-test $t(48) = -3.83, p < .05$).

Another significant difference (t-test $t(48) = 2.44, p < .05$) is related to the clitic avoidance strategies. The group of dyslexic participants opted for the pragmatically inappropriate ‘full DP instead’ (see 18 below) in 53 responses (i.e. 13.25%), whereas the age-matched control group chose this strategy in only 14 responses:
Experimenter: Ce-a făcut băiatul cu fluturășu?  
‘What did the boy do to the little butterfly?’
Child: A prins fluturele.  
has caught butterfly.the  
‘He caught the butterfly.’ (G. 7;0)

The number of ‘other’ response type was also higher with the dyslexic group. It is important to mention that the 32 responses falling within this category were all grammatical and that some of them contained a Dative clitic, used appropriately:

Experimenter: Ce-i face mama fetiței?  
‘What is mother doing to the little girl?’
Child: Îi face baie.  
cliticDATIVE 3RD SG makes bath  
‘She is washing her.’ (FM. 11;5)

The results also differed with respect to omission rate. The dyslexic group omitted the clitic in 20 responses, whereas the control group of age-matched TD children omitted the clitic in only two responses.

The number of agreement errors was very low with both groups.

A comparison of the clitic production rate of the dyslexic group (mean age 8;11) and that of the larger group of TD children revealed that the former performed at a level comparable to the one of the youngest age group, i.e. the 3- and 4-year-olds (see Table 8).

Table 8. Clitic production task: Dyslexic children and the youngest TD children

<table>
<thead>
<tr>
<th>Group</th>
<th>Age range</th>
<th>Mean age</th>
<th>AC production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dyslexia (25)</td>
<td>6;4-12;4</td>
<td>8;11</td>
<td>73.75%</td>
</tr>
<tr>
<td>TD (16)</td>
<td>2;9-4;0</td>
<td>3;6</td>
<td>75.78%</td>
</tr>
</tbody>
</table>
4.4.4 Interim summary

Accusative clitic production seems to be a vulnerable area in developmental dyslexia in Romanian. The production rate is significantly lower than with the age-matched TD controls. 8-9 year-old dyslexic children perform at a level comparable to that of 3-4 year-olds. Unlike the TD control group, the dyslexic participants often resort to a ‘full DP-instead’ structure when they avoid producing the Accusative clitic. Their responses are not ungrammatical, only pragmatically inappropriate.

4.5 Accusative clitics: a possible differential diagnosis tool?

The data presented in the previous sections show that 3rd person Accusative clitics represent a vulnerable domain both in SLI and in developmental dyslexia in Romanian, with pre-verbal clitics being more vulnerable than the post-verbal ones. The comparison of Accusative clitic production by SLI and by dyslexic children reveals that this vulnerability does not result in an identical pattern of use in the two deficits. The first obvious difference is related to production rate. Though Accusative clitic production is low with both groups, it is lower with the SLI participants. The number of ungrammatical responses is high only with the SLI participants, i.e. when they fail to produce the clitic they constantly produce an ungrammatical structure. The dyslexic group avoids producing the clitic; but their responses are not ungrammatical. They often resort to an alternative structure, such as one with verb change and a Dative clitic, which is fully acceptable, or they use a full lexical DP instead of the Accusative clitic, which is licit in terms of syntax but illicit in terms of information structure. The SLI group does not resort to this avoidance strategy.

Another difference targets the phi-features of the clitic. With some of the SLI participants, the number of responses which contain an erroneous clitic is significant. The error is one of gender and/or number. The agreement error rate is extremely low with the dyslexic group, in the range of the TD controls.

The responses of the SLI subjects in our study revealed a strong preference for object clitics in post-verbal position, with some SLI
subjects producing clitics *exclusively* in post-verbal position. This strong preference is not found with the dyslexic group, where the pre- vs. post-verbal position asymmetry is similar to the one found with the TD group.

The comparison between the two groups is presented in Table 9:

Table 9. Accusative clitic production: SLI vs. developmental dyslexia

<table>
<thead>
<tr>
<th>Marker</th>
<th>SLI</th>
<th>Developmental dyslexia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production rate below chance</td>
<td></td>
<td>lower than with TD subjects, but above chance</td>
</tr>
<tr>
<td>Full DP-instead</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>‘Other’-type grammatical responses</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td><em>Phi</em>-feature agreement errors</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Strong preference for post-V clitics</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

That the linguistic nature of the two deficits may not be identical can also be seen when one compares the results of the two groups in the repetition task (see Figures 3 and 4).

Figure 3. SLI: Repetition task results
Remember that this task contains two parts: the first one (GAPS-MS) taps into knowledge of morpho-syntax (via repetition of 11 sentences with appropriate picture support) and the second one (GAPS-Phon) tests phonological competence/memory (via repetition of 8 invented words). The results in the single nonce word repetition part are very low with both groups, but the dyslexic group performed better in the sentence repetition part, i.e. they performed more poorly at repeating single non-words (mean 4.85 out of 8) than at repeating whole sentences (mean 8.23 out of 11). Though their results are better in the first part of the test than those of the SLI children, they are still significantly lower than those of the age-matched TD control group ($t(40) = -6.97$, $p < .05$) (see Figure 5). The difference reaches significance in the phonology part as well ($t(40) = -3.56$, $p < .05$).

![Figure 4. Repetition task results: dyslexic children](image)

![Figure 5. Repetition task results (GAPS-MS): dyslexic children vs. TD children](image)
5. Discussion

The pattern of Accusative clitic use identified with the dyslexic children and the few SLI participants in our study indicates that Accusative clitic production is a linguistic marker of both language deficits. This is a vulnerable domain with both SLI and developmental dyslexia but the vulnerability seems to be of a different nature in the two deficits. The low production rate, doubled by a high omission rate and a significant number of ungrammatical responses with the SLI participants, shows that their morpho-syntax is impaired. This conclusion is reinforced by the low score in the sentence repetition task. Sevcenco et al. (2012) investigated relative clause production with the same group of SLI children. Their results show that only one of the participants in the study produced 1 SR (out of 10) and 1 DOR (out of 10). They did not produce grammatical alternatives to relative clauses, as the TD control group did; their responses were ungrammatical, just like in the clitic production task.

In spite of the paucity of the data (given the small number of SLI subjects) we think that we can conclude that they all point to the same direction, i.e. that SLI involves impaired morpho-syntax.

On the other hand, the results in the single non-word repetition task suggest that the deficit may be phonological in nature as well. However, the reason for which the SLI children omit object clitics cannot be accounted for in terms of a phonological deficit (alone). The SLI participants did not omit reflexive clitics, which are as phonologically weak as non-reflexive clitics. One difference between the two types of clitics which we think might be directly relevant for the present discussion is related to movement.

Avram and Coene (2009) propose a movement analysis for Romanian 3rd person Accusative clitics according to which they are base-generated in the complement position of the verb, as the D head of a null object, from where they enter an Agree relation with their antecedent over the subject DP and/or the phi-features of Inflection, i.e. over a possibly identical feature cluster. Clitics move to a pre-verbal position for referentiality reasons, i.e. they reach the pre-verbal
position via movement. Romanian reflexive clitics, on the other hand, have been analysed as base-generated in pre-verbal position (Dobrovie-Sorin 1998), from where they can feature match with the subject. In this case, there are neither intervention effects of potential identical feature clusters nor movement. This indicates that the computational load would be more demanding in the case of object clitic clusters than in the case of reflexive clitics, since only the derivation of the former involves long distance agreement over an intervening feature cluster and movement. That movement may play an important part is also supported by the strong pre- vs. post-verbal clitics asymmetry.

Another difference between reflexive and non-reflexive clitics is related to morphological complexity. 3rd person non-reflexive Accusative clitics mark both gender and number. 3rd person reflexive clitics do not encode either gender or number. Since the latter were not omitted in the control responses or in the sentence repetition task by any group of participants in the study14, we take it that morphological complexity might also bear some weight in the derivational process. This predicts that other morphologically complex elements might be possible linguistic markers of SLI in Romanian as well and suggests the need for intervention in this domain.

To sum up, our results indicate that in SLI it might be both morpho-syntax and phonology which are impaired. Computationally costly derivations are likely to result in ungrammatical sentences.

For developmental dyslexia the results indicate that morpho-syntax is not impaired. In the Accusative clitic production task, the responses of the dyslexic group were not ungrammatical. The omission rate was low and there were practically no agreement errors. The responses were, in some cases, pragmatically inappropriate, as was the case of the ones with a full lexical DP used instead of the clitic. At first sight, this might suggest that pragmatics is impaired. However, we have reasons to believe that the pragmatic infelicity of

14 Longitudinal data also show that reflexive clitics are not vulnerable in the acquisition of Romanian (Coene and Avram 2011).
the responses obtained in the elicitation task is a side effect of a deficit which is not pragmatic in nature. There are two things which cast doubt on the pragmatic account. Firstly, the percentage of pragmatically infelicitous answers was relatively low. Secondly, not all the participants produced such structures. Sevcenco et al. (this volume) also discuss evidence that the same group of dyslexic children choose context appropriate alternatives when avoiding direct object relatives. All these data make us believe that one cannot define developmental dyslexia as an impairment whose underlying cause is pragmatic in nature.

Many previous studies argue that developmental dyslexia results from a phonological disorder (see, for example, the review in Vellutino et al. 2004 or the discussion in Dehaene 2009, among many others). At first sight, the results of our group of dyslexic children in the single non-word repetition task (see Figures 3 and 4 above) seem to lead in this direction. But, just like in the case of SLI children, the fact that reflexive clitics are not vulnerable questions the explanatory power of a phonological deficit account. As already mentioned, the dyslexic group did not avoid producing reflexive clitics. If developmental dyslexia could be defined (only) as a phonological deficit, one could not explain the asymmetry between reflexive and non-reflexive clitics in the clitic production task. The results obtained in the single nonce word repetition task are similar for the SLI and the dyslexic groups. But their response patterns in the clitic production task are different, which indicates that clitic omission might not be caused by a phonological deficit (alone).

An alternative account available in the literature is that in developmental dyslexia verbal working memory is impaired (Fiorin 2010, Vender 2011) which would predict vulnerability of any structure which is demanding in terms of processing resources.

Accusative clitic structures could fit the profile. In the elicited production task which was used in the present study the participant has to recall the subject DP and the object DP in the elicitation question. Working memory has to actively hold information about the referential properties of the DP subject and the DP object while
simultaneously processing the sentence for meaning (e.g. for the thematic relations between the two DPs). An appropriate answer is required to contain the DP subject and the referential properties of the object translated into phi-feature information mapped onto the clitic which will substitute the lexical DP itself. Therefore, information processing in this particular case involves, among other things, translation of the reference of the DP object into phi-features, associating the phi-features with the appropriate morphological form and substitution of the lexical DP with the clitic itself. The way in which the dyslexic children coped with the clitic production task suggests that verbal working memory is impaired (see also Vender 2011 or the discussion on verbal working memory in Ingram 2007 and references therein). Verbal working memory is subject to substantial individual variation and most probably it might differ within one and the same individual, given different context variables. Therefore, we do expect lack of homogeneity in the response strategies of dyslexic children since they might resort to different processing strategies when their verbal working memory is overloaded or stretched. And this is precisely what our experimental data indicate. Importantly, the responses of the dyslexic children in our study are not ungrammatical; they are possible alternatives which they opted for when faced with transitory information which they could not manipulate fast enough and was possibly lost from active memory. We believe that defining developmental dyslexia as a verbal working memory deficit has several advantages, in spite of the fact that specialists do not agree with respect to whether one can distinguish between special verbal and general-purpose working memory. For our data, a verbal working memory deficit account can explain both the response pattern in the clitic elicitation task and the poor performance in both repetition tasks (single nonce word/ sentence). Importantly, it does not have to completely discard the phonological hypothesis. And, on a more general level, it can also explain why with some dyslexic children delayed reading skills are (also) rooted in the absence of automatic links between vision and language, a component of general-purpose working memory.
5. Conclusions

Recent research in the domain of speech impairment has been focusing on the linguistic profile of SLI. But the linguistic markers of SLI often overlap with those of developmental dyslexia making differential diagnosis difficult. For Romanian, there is no available linguistic profile for any of these two deficits yet. Therefore, it is essential that one should try to find linguistic markers which can identify these deficits and also distinguish between the two.

The main question addressed in this paper was whether 3rd person singular Accusative clitics represent one such plausible candidate. Our study represents an attempt at identifying some of the elements which are plausible candidates to the list of clinical markers of SLI and developmental dyslexia in Romanian, and which can also be used as a tool in differential diagnosis.

Experimental data from three groups of subjects, SLI, dyslexic and TD children, revealed that indeed 3rd person Accusative clitics are vulnerable in both deficits. In this respect, the Romanian data are similar to those attested for other clitic languages, such as Catalan, French, Greek, Italian, and Spanish.

On the basis of our experimental data corroborated by findings reported in previous studies we concluded that pre-verbal 3rd person Accusative clitics are the most vulnerable ones. Though 3rd person Accusative clitics in general can be argued to be a clinical marker of both SLI and dyslexia, efficient screening tests should focus on the production of the pre-verbal ones.

The comparison of the response patterns obtained in the clitic production task revealed some important differences with respect to production rate and avoidance strategies which could be used in the design of screening tests. The production rate is below chance in the case of SLI but higher in the case of dyslexic children. When producing the clitic, SLI children make gender and number agreement errors. When they avoid the clitic, the response is ungrammatical. Dyslexic children avoid producing the clitic but their ‘avoiding’ responses are rarely ungrammatical. They use alternative
constructions, among which one with a full DP direct object is the most frequent one. When they produce the clitic, there are practically no agreement errors.

The response patterns of the two groups also shed some light on the underlying cause of the deficits. In SLI, both phonology and morpho-syntax are impaired. In developmental dyslexia it is the verbal component of working memory which is impaired.

More generally, our results offer further evidence in favour of the view that the difference between SLI and developmental dyslexia is not one of severity alone, attesting to the need for different intervention.

References


Avram, L., A. Sevcenco and I. Stoicescu (2012a) ‘Accusative clitics: A linguistic marker of developmental dyslexia and/or SLI in Romanian?’. Poster presented at The Romance Turn 5, Lisbon, 2-4 July 2012.


158


Sevcenco, A., L. Avram and I. Stoicescu (this volume) ‘Subject and object relative clause production in child Romanian’.


Stoicescu, I., A. Sevcenco, L. Avram (this volume) ‘The acquisition of scalar implicatures: a linguistic marker of developmental dyslexia in Romanian?’.


