Abstract

The objective of this study is the research of specific language impairments as manifested in Slovene language. The research focuses on language processing in order to determine syntactic deficit. It has been predicted, that SLI children will meet with difficulties in the language of all elements that mark syntactic dependency.

The research has been carried out on a sample of 71 children with SLI and of 71 children with normal language development, all pupils from first to fourth grade of primary school. The children from both groups were matched by sex, socio-economic status and school environment.

This study presents an analysis of repetitions of ten sentences designed in such way that some syntactic elements have been varied. The variables of language processing and those of morpho syntactic command were obtained from the elicited repetition task (including different syntactically complex structures).

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Резиме

Целта на оваа студија е истражување за јазични- те нарушувања што се манифестираат во словенечкиот јазик. Истражувањето се фокусира на ја- зичната обработка за да се детерминира синтак- сичниот дефицит. Се предвиде дека децата со СЈН (специфично јазично нарушување) ќе нан- дат на тешкотии во јазикот кај сите елементи што ја означуваат синтаксичката зависимост.

Истражувањето се реализира на примерок од 71 дете со СЈН и 71 дете со нормален јазичен развој, сите ученици од прво до четврто одделение во основно училиште. Децата од двете групи се сло- жуваат по полот, социоекономскиот статус и училишната средина.

Оваа студија презентира анализа на повторување десет реченици дизајнирани на таков начин при што некои синтаксички елементи варираат.

Варијаблите на јазичната обработка и оние од морфосинтактичката наредба се добија од задача- та на изнудено повторување (вклучувајќи различни синтаксички комплексни структури).

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The results show, that SLI children use certain structure less frequently than age controls and that there are not only statistically important differences in the majority of the sentences with different syntactic complexity, but also that the tasks applied can differentiate specific language impairments as well. The research has put up some syntactic deficit of SLI in Slovene language as they can be identified by means of targeted sentences.

In syntax, children with SLI have problems with depended relations, with language processing and structuring of coordinate and subordinate clauses and also in the simple sentences. Furthermore, they have problems with subject-predicate agreement and, when they repeat sentences, with coordinate elements.

**Keywords**: specific language impairment, syntax, syntactic deficit, compound sentences, complex sentences

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**Introduction**

Specific language impairment (SLI) is developmental disorder of various profiles and degrees of language impairment expressed in the context of normal cognitive abilities, without presence of any known cause. (1).

Children with SLI have weaknesses in all areas of language. The most affected is grammatical morphology and syntax. They have a relative weakness in the grammatical morphology and use certain syntactic structures less frequently than children with normal language development.

Hallmark of SLI is a deficit in grammar. The mosaic of possible causes comprises of deficit in linguistic knowledge, general processing limitations and processing deficits in specific cognitive mechanisms. It is also often suggested, that SLI may have a genetic component.

The interaction of possible causes of disorder results in heterogeneous phenotype of language difficulties. A form and presence of language symptoms also change with an increase of age. There are many theories explaining the nature of specific language impairment.
They generally focus on weaknesses in grammar, such as lack of knowledge of grammar rules and principles. Many researchers see grammatical deficits in SLI in the inability to acquire rules for marking tense, number and person (2, 3, 4, 5, 6, 7, 9). They also suggest, that many children with SLI have been shown to be impaired in producing and comprehending syntactically complex structures (5, 6).

The results of cross-linguistic researches suggest, that the essence of specific linguistic impairment lies in deficit of in flexional morphology and syntax.

In syntax, the characteristic deficits are problems with relations within the sentence, especially subject-verb agreement, and with relations of coordinate and subordinate clauses.

With all this in mind, the focus of our study was language processing of sentences of different syntactic structures and complexity in Slovene language.

We presumed that SLI children will have difficulties in language processing of all elements, that mark syntactic dependency.

Our hypothesis is that there are differences between SLI children and children with normal language development (NLD) in the domain of syntax and in successfulness of repetition of sentences with different complexity structures.

Material and methods

Participants

The research has been carried out on a sample of 71 children with SLI and of 71 children with normal language development (NLD). All pupils were attending first to fourth grade of primary school, they were all Slovene speaking and monolingual. The SLI children were diagnosed and treated in Counseling Centre in Ljubljana. Children from both groups were matched by sex, socioeconomic status and school environment.

The structure of the test sentence

Testing procedure for identifying and evaluating syntactical problems of Slovene speaking SLI children was an elicited repetition task.
When the length of the sentence exceeds the child's working memory, there are number of factors that indicate, that the answer was in fact processed through the linguistic system.

In order to isolate the roles of syntactic elements in language processing, one should design sentences with all elements which one wants to test. We designed ten sentences in such way, that some syntactic elements were variable.

First group consisted of three sentences, that had a simple sentence structure (subject-verb-object). Second group consisted of three compound sentences, that had a complex syntactic structure with independent relation. Compound sentences had two independent clauses joined by coordinating conjunction and, but and namely.

And third group consisted of four complex sentences, that had complex syntactic structure with dependent relation between clauses - dependent clause (objective, temporal, causal and attributive) joined to an independent clause.

In that way, the variables of language processing and those of morpho syntactic command were obtained from the elicited repetition task (including different syntactically complex structures).

All ten sentences were used as variables of investigation.

Procedure
Each child was tested separately. The sentences were read to her/him aloud by examiner, one by one sentence, and she/he was asked to repeat them immediately, as accurately as possible. The sessions were recorded.

Results
The results of robust discriminant analysis and univariate analysis of variance are summarized for all ten variables in Table 1 and Table 2.
Табела 1. Резултати од дискриминантната анализа на во варијаблите меѓу групата со СЈН и групата со НЈР

<table>
<thead>
<tr>
<th>Функција (Function)</th>
<th>Ламбда (Lambda)</th>
<th>F</th>
<th>df1</th>
<th>df2</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3.5912</td>
<td>126.99</td>
<td>140</td>
<td>1</td>
<td>.000</td>
</tr>
</tbody>
</table>

Табела 2. Дискриминантен функцијски коефициент (c), корелација со дискриминантна функција (r), униваријантна анализа на варијансата (F, Sig.) и центроиди на групите

<table>
<thead>
<tr>
<th>Варијабли (Variables)</th>
<th>c</th>
<th>r</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>реченица 1 (sentence 1)</td>
<td>.29</td>
<td>.65</td>
<td>26.00</td>
<td>.000</td>
</tr>
<tr>
<td>реченица 2 (sentence 2)</td>
<td>.15</td>
<td>.53</td>
<td>7.01</td>
<td>.009</td>
</tr>
<tr>
<td>реченица 3 (sentence 3)</td>
<td>.31</td>
<td>.67</td>
<td>30.43</td>
<td>.000</td>
</tr>
<tr>
<td>реченица 4 (sentence 4)</td>
<td>.37</td>
<td>.68</td>
<td>45.74</td>
<td>.000</td>
</tr>
<tr>
<td>реченица 5 (sentence 5)</td>
<td>.38</td>
<td>.63</td>
<td>50.36</td>
<td>.000</td>
</tr>
<tr>
<td>реченица 6 (sentence 6)</td>
<td>.34</td>
<td>.65</td>
<td>36.95</td>
<td>.000</td>
</tr>
<tr>
<td>реченица 7 (sentence 7)</td>
<td>.29</td>
<td>.56</td>
<td>25.80</td>
<td>.000</td>
</tr>
<tr>
<td>реченица 8 (sentence 8)</td>
<td>.18</td>
<td>.42</td>
<td>9.98</td>
<td>.002</td>
</tr>
<tr>
<td>реченица 9 (sentence 9)</td>
<td>.40</td>
<td>.72</td>
<td>56.36</td>
<td>.000</td>
</tr>
<tr>
<td>реченица 10 (sentence 10)</td>
<td>.36</td>
<td>.68</td>
<td>44.72</td>
<td>.000</td>
</tr>
</tbody>
</table>

Центроиди на групи (Centroids of groups)
Група на СЈН: C1 = -1.34 (SLI group: C1 = -1.34 )
Група на НЈР: C2 = 1.34 (NLD group: C2 = 1.34)

Разликите меѓу групите на деца со СЈН и деца со НЈР се статистички значајни во сите десет варијабли.

Децата со СЈН беа помалку успешни и имаа најмногу тешкотии со обработката на речениците што имаа различни комплексни синтаксички структури.

Комплексната реченица со причинска дел реченица беше одговорна за најголемата разлика меѓу групите. Други вредности за дискриминантен функцијски коефициент се (по ред на рангирање):

Differences between groups of SLI children and NLD children are statistically significant in all ten variables.

SLI children were less successful and had most difficulties with processing the sentences, that had different complex syntactical structures.

Complex sentence with causal clause was responsible for the biggest difference between groups.
Other values for discriminant function coefficient are (in ranking order):
• сложена реченица со две независни дел-реченици поврзани со координатниот сврзник _ами_ - варијабла 2;
• сложена реченица со две независни дел-реченици поврзани со координатниот сврзник _уи_ - варијабла 3;
• сложена реченица со зависна атрибутска дел-реченица поврзана со независна дел-реченица -варијабла 4;
• сложена реченица со две независни дел-реченици поврзани со координатниот сврзник _имено-варијабла 5._

Резултатите на успешност при повторувањето на речениците се сумираны во Табела 3 и Слика 1.

Во нашето истражување, ние се интересираше на кој начин децата ги повторуваат речениците. Ги анализираше сите одговори и откривме дека имаше три можни начини на повторување и тие ги сместиште во следните категории: 0-неточни граматички повторувања, 1-семантички неточни повторувања, граматички точни и 2-успешни повторувања.

**Табела 3. Успешност во повторувањето на речениците**

<table>
<thead>
<tr>
<th>Повторување на речениците (Repetitions of the sentences)</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>вкупно (total)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Група на СЈН (SLI group)</td>
<td>250</td>
<td>177</td>
<td>283</td>
<td>710</td>
</tr>
<tr>
<td>Група на НЈР (NLD group)</td>
<td>91</td>
<td>113</td>
<td>506</td>
<td>710</td>
</tr>
</tbody>
</table>

**Слика 1. Успешност во повторувањето на речениците**

The results in successfulness in the repetition of the sentences are summarized in Table 3 and Figure 1.

In our research, we were interested, in what kind of way, children are repeating sentences. We analyzed all answers and we found out there were three possible ways of repetition, and we put them in following categories: 0-grammatically uncorrect repetitions, 1-semantically uncorrect repetitions, grammatically correct and 2-successful repetitions.

**Table 3. Successfulness in the repetition of the sentences**

<table>
<thead>
<tr>
<th>Повторување на речениците (Repetitions of the sentences)</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>вкупно (total)</th>
</tr>
</thead>
<tbody>
<tr>
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<td>250</td>
<td>177</td>
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</tr>
<tr>
<td>Група на НЈР (NLD group)</td>
<td>91</td>
<td>113</td>
<td>506</td>
<td>710</td>
</tr>
</tbody>
</table>

**Figure 1. Successfulness in the repetition of the sentences**

<table>
<thead>
<tr>
<th>Група на СЈН (SLI group)</th>
<th>Група на НЈР (NLD group)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>40%</td>
<td>71%</td>
</tr>
<tr>
<td>35%</td>
<td>13%</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>25%</td>
<td>16%</td>
</tr>
</tbody>
</table>
Дискусија
Претпоставуваме дека комплексните реченици се потешки од сложените реченици дури и за децата с НЈР. Сите ученици беа на седум до десет годишна возраст, а во тој период, сите комплексни синтаксички структури веројатно се уште не се стекнати. За жал, не постојат истражувања во словенечкиот јазик за развојните пресвртици за усвојување на детската синтакса.
Децата со СЈН имаат најмалите проблеми со едноставните реченици. Интересно, само едноставна реченица „Avto je zapeljal pred dvorano pol ure pred priedivijo“ („Кола се довезе пред салата, пол час пред претставата да почне.“) беше високо дискриминативна (пробирлива). Предлогот „пред“ на словенечки јазик е хомоним со две значења-тој е предлог за време и место. Па така може да видиме дека дури едноставна реченица, но со необични синтаксички врски може да биде проблематична за дечата со СЈН.
Откривме дека децата со СЈН имаат сериозен проблем со синтаксата. Нашите откритии се поткрепени со резултати од нашите истражувања. Нашите резултати исто така ја поддржуваат Хипотезата за репрезентативниот дефицит на зависност на Ван дер Лели и Бател (8).
Како што може да се види во Табелата 2, постојат значителни разлики во однос на сите варијабли појати, па заради тоа овие реченици може да се користат како дијагностичка процедура за идентификување на синтактикот дефицит кај деца со СЈН. Ние исто така се интересирање на кој начин децата ги повторуваат речениците.
Категоријата успешно повторување ја одразува многу добрат синтаксичка способност. Децата со СЈН беа помалку успешни во повторувањето на речениците од нивните врсници со нормален јазичен развој.
Некои од децата со СЈН ги сменија семантичките структуре на речениците бидејќи имаа проблеми со обработката на комплексната синтакса. Така тие некои реченици ги повторуваа граматички точно, но семантички неточно. Заради синтаксичниот дефицит, те не се способни да ги сфатат бараните синтактики правила и ја менуваат семантичката структура користејќи поединствената синтакса иако точна.

Discussion
We presume, that complex sentences are more difficult than compound sentences even for children with NLD. All participants were seven to ten years old, and in that period, all complex syntactical structures are probably not yet acquired. Unfortunately, there are no researches in Slovene language about developmental milestones for acquisition of children's syntax.
Children with SLI have least problems with simple sentences. Interestingly, only simple sentence “Avto je zapeljal pred dvorano pol ure pred priedivijo“ (“Car drove in front of the hall, half an hour before the show started”) was highly discriminative. Proposition “pred“ in slovene language is homonym with two meanings-it is temporal and local proposition. And so we can see, that even a simple sentence, but with unusual syntactical relations can be problematic for children with SLI.
We found out, that children with SLI have a serious problem with syntax. Our findings are supported by results from other researches. Our results are also supporting Representational Deficit for Dependency hypothesis from Van der Lely and Batell (8).
As it can be seen in Table 2, there are significant differences in means of all variables between both groups, and because of that, these sentences can be used as diagnostic procedure for identifying syntactic deficit in children with SLI.
We were also interested, in what kind of way, children are repeating sentences.
Category successful repetition reflects a very good syntactic ability. Children with SLI were less successful in repeating sentences than their peers with normal language development.
Some of SLI children changed the semantic structure of sentences because they had problems with processing complex syntax. Thus they repeated some sentences grammatically correct but semantically incorrect. Because of syntactical deficit, they are unable to consider required syntactic rules and they changed semantic structure by using more simple syntax, although correct.
Thus category of semantically uncorrect repetitions, grammatically correct reflects a deficiency of language knowledge and not yet acquired grammatical rules of language. Semantical content of the verbal message with exactly defined grammatical structure, that is not yet competently acquired, children with SLI change with another structure, one, that is more simple for them.

The best indicator for syntactic deficit is a category of grammatically uncorrect repetitions. Children with SLI had problems with syntax in the 35% of all sentence repetitions. If we add this to category of semantically uncorrect repetitions, grammatically correct, we see, that 60% of all sentence repetitions were problematic.

Children with NLD also had some problems with sentence repetitions, but to considerably lesser extent.

To summarize, there are two kinds of mistakes with sentence repetition. Because of the syntactical deficit in children with SLI, they either simplify complex syntactical structures or they change the meaning of sentence.

At last, we may conclude, that SLI children were less successful and had most difficulties with processing the sentences, that had different complex syntactical structures. Because of the syntactical deficit in children with SLI, they either simplified complex syntactical structures or they changed the meaning of sentence.

With all this in mind, the sentence repetition task can be used as diagnostic procedure for identifying syntactic deficit in children with SLI.

References