

# Impact of general processing capacities on complex language processing in French SLI children

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## ABSTRACT

These studies assess the 'limited capacity theory' of Specific Language Impairment (SLI) by assessing the influence of processing capacity limitations on syntactic comprehension in children with SLI.

## INTRODUCTION

Children with SLI present particularly poor abilities in processing syntactic information. Limitations in processing capacity have been proposed to account for various aspects of production and comprehension difficulties experienced by SLI children (e.g., Ellis Weismer & Hesketh, 1996). In this view, performance of SLI can be compromised by a limitation in available cognitive resources while processing demands are high. Given the complexity of cognitive processes involved in sentence comprehension (i.e., processing a sequence of symbols, access to long-term memory, constructing and integrating ideas while storing the intermediate and final products of the computations), the study of sentence comprehension in SLI could be particularly informative with respect to the 'limited capacity theory' of SLI.

## STUDIES

Two studies assess the 'limited capacity theory of language impairment' by assessing the influence of syntactic complexity on comprehension in children with SLI. If processing capacities limitations are at the root of sentence comprehension problems in SLI, we expect their performances to be specifically impaired for complex sentences in comparison with children without language problems.

## METHODS & RESULTS

### STUDY 1

#### Participants

14 SLI children aged 8 to 13 and 14 syntactic controls (SC)

#### Task

Off-line sentence comprehension:

(Word number, word frequency, and syllable length controlled)

#### • Semantic plausibility manipulation

1. Nonreversible sentences: « La vache regarde la fille qui lit. »
2. Reversible sentences: « Le monsieur filme la dame qui mange. »
3. Implausible sentences: « Le monsieur voit le chien qui vole. »

#### • Embedding manipulation

1. Unembedded clauses: « Le monsieur filme la dame qui mange. »
2. Embedded clauses: « La dame qui lit regarde la fille. »

#### Results

#### • Group effect : $F < 1$

No difference between SLI and controls.

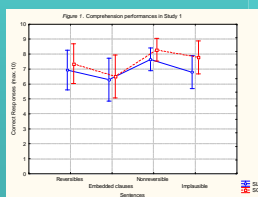
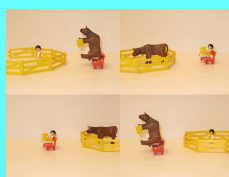
#### • Sentence effect : $F(3,78)=4.94, p < .01$

There is a semantic impact on performance (Figure 1)

Significant pair-wise comparisons:

- non reversible > reversible ( $p < .05$ )
- non reversible > implausible ( $p < .05$ )

#### • Interaction effect : $F < 1$



### STUDY 2

#### Participants

15 SLI aged 7 to 13, 15 lexical controls (LC) and 15 age controls (AC)

#### Task

Off-line sentence comprehension:

(Word number, word frequency, and syllable length controlled)

1. Subject clauses: « Montre-moi le cheval qui mord les chiens. »
2. Object SV clauses: « Montre-moi le cheval que les chiens mordent. »
3. Object VS clauses: « Montre-moi le cheval que mordent les chiens.. »

#### Results

#### • Group effect : $F(2,42) = 5.12, p < .05$ (Figure 2)

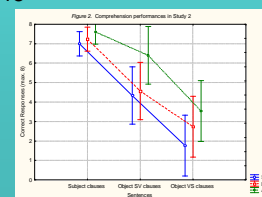
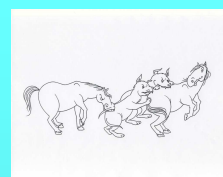
Newmann-Keuls post-hoc: SLI < AC ( $p < .01$ ); LC < AC ( $p < .05$ )

#### • Clause effect : $F(2,84) = 113.31, p < .0001$

Significant pair-wise comparisons ( $p < .0001$ ):

subject clauses > object SV clauses

#### • Interaction effect : $F(4,84) = 1.6, p = .18$



## DISCUSSION

SLI are not specifically impaired for the most complex sentences in comparison with controls. However, these results might be due to the tasks and items used. Previous studies showing a specific impairment on sentence comprehension performance in SLI have used more demanding tasks such as grammatical judgement task (Lum & Bavin, 2007) or listening span task (Ellis Weismer, Evans & Hesketh, 1999). Moreover, some authors have found differences only for long sentences (Montgomery, 2000) or sentences with more arguments (Redmond & Rice, 2001). The syntactic parameters manipulated in our two studies do not seem to specifically affect SLI children performances. These results are in contrast with a grammatical explanation of SLI. Future studies must assess the impact of other non-syntactic manipulations on SLI performances, in order to evaluate if the morphosyntactic problems of SLI could be the consequence of other cognitive demands linked to the task, such as increased processing and storing demands.

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