Pragmatics and SLI

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1. INTRODUCTION
Models of cognition and grammar can help generate hypotheses about the nature of language disorders, and vice versa. Specific Language Impairment (SLI) is a particularly relevant field of research in this respect because the impairment is supposed to be restricted to language, i.e. no other cognitive function is disordered. Although this chapter focuses on SLI, it would be interesting to test the proposed hypotheses in other language disorders as well.

One important hypothesis concerning cognition and grammar has been proposed by Fodor (1983) and Chomsky (1986), namely the Modularity Hypothesis, which views cognition in general, and language, in particular, as arising from a complex interaction of various cognitive domains and further, that these domains are autonomous in the sense that they are governed by distinct principles. This description suggests that we can distinguish two types of modularity, namely within cognition, and within language. The former considers language one of the modules of cognition (“Big Modularity” – Levy and Kave, 1999); the latter concerns the modular organization within language (“Small Modularity” – Levy and Kave, 1999).

Results of SLI studies showing that impairment can be isolated to language only provide support for “Big Modularity”. As for “Small Modularity”, the question arises as to what modules language itself comprises. I take a Chomskyan view of language as a starting point, and assume the modules of language to be as in (1):

(1) **Modules of Language**

I. Lexicon  
II. Computational System: Grammar: - morphosyntax
III. Pragmatic System

In this study, I focus on the question whether and how the Computational System and the Pragmatic System are distinct modules, and how they interact. More specifically, I concentrate on the influence of a certain type of pragmatics on (morpho-)syntax. I hypothesize that this type of pragmatics is a distinct module separate from the Computational System, and therefore from (morpho-)syntax. Hypothesizing furthermore that children with SLI have deficits in their grammar (as described in (1 II)) only, I predict that, unlike normally developing children, (MLU, language-age matched) children with SLI will not display errors caused by the lack of certain pragmatic principles. If this turns out to be the case, we have support for the hypotheses that pragmatics is a system, and perhaps a module, distinct from (morpho-)syntax, and for the hypothesis that children with SLI do not have pragmatic deficits. If the prediction described is not borne out, we might be forced to assume that SLI implies deficits in both (morpho-)syntax and the Pragmatic System, or that (part of) the Pragmatic System belongs to the Grammar module.

I test the hypotheses formulated above by comparing the spontaneous language production of Dutch children with SLI with younger Dutch normally developing children. The topic of investigation is object scrambling, a syntactic phenomenon that I argue to be driven by a pragmatic principle.

In the next section I provide some relevant background regarding adult pragmatics, speaker and hearer knowledge, object scrambling in adult Dutch, and object scrambling in child Dutch. In section 3 I lay out my hypotheses and predictions followed by a methods section (4) in
which I describe how I tested these. Section 5 provides the results, which are discussed in section 6. Section 7 contains a conclusion.

2. BACKGROUND

2.1 DIFFERENT TYPES OF PRAGMATICS

An investigation into the literature on the pragmatic abilities (to be specified below) of children with SLI reveals a variety of results. In some studies, children with SLI perform below the level of MLU controls (Snyder, 1975; 1978; Sheppard, 1980; Siegel et al, 1979; Stein, 1976; Watson, 1977). In other instances, no differences are found (Rowan et al., 1983; Prinz, 1982; Prelock et al., 1981), and in still others, the children with SLI perform at higher levels (Leonard et al.1982; Johnston et al., 1993; Leonard, 1986; Craig and Evans, 1989). Furthermore, a few studies report no differences between children with SLI and normally developing children of the same age (for more discussion on the pragmatic abilities of children with SLI, cf. van der Lely, this volume). The studies which report poorer performance on pragmatic skills by children with SLI than control children evoke the question of whether the weaker morphosyntactic abilities of the children with SLI get in these children's way, restricting their ability to exhibit pragmatic knowledge that they possess or whether they really lack certain pragmatic principles.

Most studies referred to above concern pragmatic abilities such as Speech Acts, Conversational Participation and Discourse Regulation (initiations, replies, topic maintenance, turn taking, utterance repair, etc.), and Code Switching. It is feasible that these types of pragmatic skills are shaped by morphosyntactic abilities. If, for example, there are problems with verbal inflection, this may affect the production of a correct imperative, i.e. the speech act of a command or a request. Whether this is true vice versa (linguistic pragmatic principles affecting morphosyntax) is less clear, but I do not exclude the possibility.

In the present study I concentrate on a different type of pragmatics, which seems to have a much more immediate impact on the linguistic structure. Along the lines of Kasher (1991), I
assume that notions such as “reference” and “presupposition” belong to this type of pragmatics, which is referred to as “Interface Pragmatics”. For example, understanding and producing certain referential expressions, such as she or there, involves integration of the output of a language module with the output of some perception/production module, each serving as input for some central unit which produces the integration of the linguistic structure and its context. Furthermore, in order to use referential expressions correctly, the speaker needs to be aware of the hearer’s current knowledge or assumptions. A speaker cannot refer to an object which has not been mentioned in the preceding discourse or is not present in the situational context with a definite determiner, or with a pronoun.

In this sense, pragmatic principles immediately influence the realization of certain linguistic structures, such as the choice of pronominal elements versus noun phrases, the choice between definite and indefinite nominal expressions, and, in turn, their correct position in the syntactic structure. Thus, pragmatic principles such as the ones illustrated above serve as some sort of a connector between linguistic structures and context, hence the term “Interface Pragmatics”.

In order to obtain an answer to the question as to whether the pragmatic system of children with SLI can be impaired in its own right, and is not the result of impaired morphosyntax, I chose to investigate interface-pragmatic principles, since it clearly influences the realization of the (morpho-)syntax. In the next section I discuss a concept that is likely to be part of Interface Pragmatics.

2.2 SPEAKER AND HEARER KNOWLEDGE

Referential expressions such as pronouns and locative there are the output of Interface Pragmatics. The question is what exactly the interface-pragmatic principles are that govern the appropriate use of such linguistic elements. I propose that one of them is the "Concept of Non-
Shared Knowledge" (Schaeffer, 1997; 1999; 2000). This concept makes crucial use of the notions "Speaker Knowledge" and "Hearer Knowledge", which I will explain first.

In order for a conversation not to break down, a speaker needs to take into account what his interlocutor, the hearer knows. For example, if a speaker starts a conversation out-of-the-blue with the sentence: "The tree fell down" in a situation in which there is no tree visible, her interlocutor/hearer will be confused, because the use of the definite determiner *the* implies that the reference of the noun *tree* is known, or familiar not only to the speaker, but also to the hearer. The hearer does not know the reference of *tree* because it has not been introduced to her in the preceding discourse. Consequently, communication break-down takes place. This phenomenon is also referred to as "Presupposition Failure". Similar break-downs occur when pronouns are used out-of-the-blue.

I claim that break-downs such as the ones described above are the result of a failure in the Interface Pragmatics, namely in the application of the “Concept of Non-shared Knowledge”, which is defined in (2):

\[(2) \quad \text{Concept of Non-shared Knowledge}\]

\[\text{Speaker and hearer knowledge are always independent.}\]

The Concept of Non-shared Knowledge expresses an obligation for the speaker to consider the hearer’s knowledge as a separate entity and therefore as something that is in principle different from the speaker’s knowledge. However, in certain cases, speaker and hearer knowledge may coincide. Notice that if the Concept of non-shared knowledge is absent, or fails to apply, speaker and hearer knowledge are not always independent, implying that there are situations in which the speaker automatically attributes her/his own knowledge to the hearer.

Returning to SLI, investigating speaker/hearer knowledge in children with SLI can provide a better insight into the question whether Interface Pragmatics is a device separate from
other types of pragmatics and from the Computational System, and the question whether pragmatics in general, and Interface Pragmatics in particular, can be problematic for children with SLI in its own right, rather than being the consequence of impaired morphosyntax. I will show this by analyzing one of the many linguistic effects of the application of the Concept of Non-shared Knowledge, namely the syntactic phenomenon of "Object Scrambling" in the language production of Dutch children with SLI. But before we turn to SLI, let me first describe this phenomenon in adult Dutch, and report some results regarding object scrambling in normally developing Dutch child language.

2.3 OBJECT SCRAMBLING IN ADULT DUTCH

In Schaeffer (1997; 2000) I show that speaker/hearer knowledge has an effect on the choice of certain syntactic structures, such as the position of the object in languages such as Dutch and German. In these languages, the object can occupy a position either preceding or following an adverb or negation. When it precedes the adverb or negation, it is said to be "scrambled". In the literature, object scrambling is often argued to be driven by referentiality: a referential object scrambles (over adverbs and/or negation), a non-referential object does not. This is illustrated in (3) (the adverb and the object are bold-faced):

\[(3) \]

\[\begin{align*}
\text{a. & non-referential object: unscrambled} \\
& \ldots \text{dat Saskia waarschijnlijk een boek gelezen heeft} \\
& \ldots \text{that Saskia probably a book read has} \\
& '\ldots \text{that Saskia probably read a book'} \\
\end{align*}\]

\[\begin{align*}
\text{b. & referential object: scrambled} \\
& \ldots \text{dat Saskia het boek waarschijnlijk gelezen heeft} \\
& \ldots \text{that Saskia the book probably read has}
\end{align*}\]
Referentiality can be formulated in terms of speaker and hearer knowledge: a nominal expression is referential if its referent is known to at least the speaker; it is non-referential if the referent is known to neither the speaker, nor the hearer.

Furthermore, I argue that there are two types of referentiality: referentiality that is caused by the introduction of the referent in the previous linguistic discourse, and referentiality that is due to long-term shared knowledge between speaker and hearer. An example of the former, which I call "discourse-related referentiality" is given in (4a), an example of the latter, which I call "non-discourse-related referentiality" in (4b):

(4) a. discourse-related referentiality

Weet je nog dat Jan vorige maand een boek gekocht heeft?

know you still that Jan last month a book bought has

‘Do you remember that John bought a book last month?’

Hij heeft het boek waarschijnlijk nog steeds ongelezen in de kast staan.

he has the book probably still unread in the book case stand-INF

‘The book is probably still in the book case without having been read’

b. non-discourse-related referentiality

Wat heeft Jan toch al die tijd gedaan?

what has Jan yet all that time done
‘What has John been doing all that time?’

Hij heeft waarschijnlijk de bijbel gelezen.

Hij has probably the bible read

‘He has probably been reading the bible’

In (4a), the nominal expression *het boek* ('the book') receives its referential interpretation from the fact that it has been introduced in the preceding linguistic discourse as *een boek* ('a book'). In (9b), on the other hand, the nominal expression *de bijbel* ('the bible') is referential because its referent is part of the long-term shared knowledge between speaker and hearer. Therefore, it does not need to be introduced in the linguistic discourse.

Notice furthermore, that a discourse-related referential nominal expression (such as *het boek* - 'the book') must scramble over the adverb, whereas a non-discourse related referential nominal expression can remain in a position following the adverb. Thus, the two types of referentiality render different syntactic effects in terms of word order. It may now become clear that in order to determine whether a nominal expression is referential or not, one must be able to distinguish discourse-related from non-discourse related referentiality. For this, one needs to understand exactly what speaker and hearer knowledge is, and that they are independent of each other. If the speaker realizes that the referent of a nominal expression s/he wants to use is not part of the hearer's knowledge, s/he must introduce it in the linguistic discourse. This turns it into a discourse-related referential expression, which must scramble. If, on the other hand, the speaker knows that the referent of a nominal expression s/he wants to use IS part of the hearer's knowledge (e.g. by virtue of long-term shared knowledge between speaker and hearer), s/he needs not introduce it in the linguistic discourse, and s/he does not need to scramble it over the adverb.

2.4 FINDINGS FOR NORMALLY DEVELOPING CHILD DUTCH
In Schaeffer (1999; 2000) I argue that normally developing children up to about age 3;0 lack the pragmatic Concept of Non-Shared Knowledge. This means that children this age often automatically attribute their own knowledge to the hearer. If they do this, they cannot correctly infer what referentiality is. This is the reason that Dutch 2-year old children often fail to scramble referential objects in obligatory contexts. The findings of two studies on object scrambling I carried out in 1995 and in 1997 are summarized in (5) and (6), respectively.

In Schaeffer (1995) I investigated object scrambling in the spontaneous speech of two Dutch children: Laura and Niek. Laura's data were kindly made available to me by her mother and linguist, Jacqueline van Kampen, who kept track of Laura's language development from age 1;9 to 5;4 in the form of written diary notes. Niek is one of the Dutch children whose data are accessible through CHILDES (MacWhinney and Snow, 1985). He was recorded bi-weekly from age 2;7 to 3;11 in play situations. Neither of the children showed high numbers of relevant utterances, however, their speech provides an indication for the use of object scrambling by young Dutch children.

The results show that Laura fails to scramble referential objects in obligatory contexts around 70% of the time up till age 3;4. After this age this percentage drops to 12%. Niek leaves referential objects unscrambled around 25% of the time, but for a longer period, namely up till age 3;11.¹

A larger-scale study using an elicited production task with 49 Dutch speaking children between the ages of 2;4 and 3;11 (Schaeffer, 1997, 2000) shows that Dutch 2-year olds fail to scramble referential objects in obligatory contexts around 70% of the time, a percentage that drops dramatically in the responses of the 3-year olds.

(5) Scrambling in spontaneous child Dutch (Schaeffer, 1995)
Subjects

Laura - stage I: 1;9 - 3;4
  stage II: 3;4 - 5;4
Niek - stage I: 2;7 - 3;5
  stage II: 3;6 - 3;11

Results

Table 1: Proportions of unscrambled referential objects (pronouns) in spontaneous speech

<table>
<thead>
<tr>
<th></th>
<th>stage I</th>
<th>stage II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laura</td>
<td>70%</td>
<td>12%</td>
</tr>
<tr>
<td>Niek</td>
<td>29%</td>
<td>22%</td>
</tr>
</tbody>
</table>

(6) Scrambling results from Elicited Production Task (Schaeffer, 1997; 2000)

Subjects

7 Dutch 2-year olds - 2;4-2;11
13 Dutch 3-year olds - 3;0 - 3;11

Results
Table 2: Proportions of unscrambled referential objects in elicited production task

<table>
<thead>
<tr>
<th></th>
<th>definite DP</th>
<th>personal pronoun</th>
<th>demonstrative pronoun</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-year olds</td>
<td>70%</td>
<td>67%</td>
<td>83%</td>
</tr>
<tr>
<td>3-year olds</td>
<td>28%</td>
<td>5%</td>
<td>22%</td>
</tr>
</tbody>
</table>

Young Dutch children also produce a large number of determinerless object nouns (prohibited in adult Dutch), of which the majority is unscrambled. The results of both the spontaneous speech and the elicited production task studies referred to above are provided in (7) and (8), respectively:

(7) Table 3: Proportions of scrambled and unscrambled determinerless object nouns in Dutch spontaneous child speech (Schaeffer, 1995)

<table>
<thead>
<tr>
<th></th>
<th>stage I</th>
<th>stage II</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Scrambled</td>
<td>unscrambled</td>
<td>scrambled</td>
</tr>
<tr>
<td>Laura</td>
<td>0% (0)</td>
<td>100% (18)</td>
<td>0% (0)</td>
</tr>
<tr>
<td>Niek</td>
<td>18% (11)</td>
<td>82% (50)</td>
<td>23% (10)</td>
</tr>
</tbody>
</table>
Table 4: Percentage of scrambled and unscrambled determinerless object nouns in elicited production task with Dutch children (Schaeffer, 1997)

<table>
<thead>
<tr>
<th>Age</th>
<th>Scrambled</th>
<th>Unscrambled</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-year olds</td>
<td>11% (3)</td>
<td>89% (24)</td>
</tr>
<tr>
<td>3-year olds</td>
<td>30% (3)</td>
<td>70% (7)</td>
</tr>
</tbody>
</table>

This phenomenon is probably due to the more general syntactic phenomenon of determiner drop that has been observed cross-linguistically in the speech of young children. The reason why these determinerless object nouns do not scramble is as follows: the determiner spells out an abstract referentiality feature and marks the whole nominal expression as referential. When there is no determiner, referentiality is not realized, which means that the entire nominal expression is not marked for referentiality. Therefore, scrambling does not take place.

In terms of developmental stages, the syntactic phenomenon of determiner drop in child language co-occurs with the failure of object scrambling, including unscrambled objects with determiners. However, it remains to be seen whether there is a causal correlation between the two phenomena, or whether they just happen to appear at around the same age. The language development of normally developing Dutch children cannot provide much insight in this matter.

In the next section I turn to the language development of Dutch children with SLI and lay out my hypotheses and predictions regarding pragmatics and the syntactic phenomenon of object scrambling.

### 3. HYPOTHESES AND PREDICTIONS

As I hinted at in the introduction, there are several types of hypotheses to be formulated with respect to the status of the Pragmatic System and the syntactic and pragmatic competence of
children with SLI. I will first formulate the more general hypotheses, dealing with the nature of pragmatics, and then propose some hypotheses that concern the language of children with SLI.

As for the Pragmatic System, I hypothesize that Interface Pragmatics is a system, and perhaps a module in itself. Fodor (1983) and Kasher (1991) define 'module' as a cognitive system that is independent, in several significant respects: (i) it is domain-specific; (ii) it is informationally encapsulated; (iii) it is associated with fixed neural architecture; (iv) it has specific breakdown patterns; (v) its ontogeny has a characteristic pace and sequencing. Kasher differs from Fodor in assuming that a module is not necessarily a system that functions as the input to other systems.

Furthermore, I adopt the hypothesis that children with SLI are impaired in their grammar only, and therefore not in their Interface Pragmatics. More specifically, I hypothesize that children with SLI older than 3 have an intact Concept of Non-shared Knowledge, one of the principles of Interface Pragmatics. If older children with SLI have the Concept of Non-shared Knowledge, similar to their normally developing age mates, they know what speaker and hearer knowledge is, and therefore they are able to construe and interpret referentiality correctly in an adult-like fashion. Assuming that referentiality is the driving force behind object scrambling, it is predicted that children with SLI older than 3 do not fail to scramble referential objects in obligatory contexts.

Moreover, adopting the assumption that determiner drop in normally developing child language is a syntactic phenomenon, independent of the Concept of Non-shared Knowledge, I predict that children with SLI may drop determiners. If they do, referentiality is not realized, and therefore determinerless object nouns will remain unscrambled.

Now that I have laid out my hypotheses and predictions, let us turn to the SLI data.

4. METHODS

4.1. SUBJECTS
I investigated the spontaneous speech of 20 Dutch children with SLI between the ages of 4;2 and 8;2 and an MLU range of 2.1 - 5.7. These data were collected by Gerard Bol and Folkert Kuiken (Bol & Kuiken, 1988). The details regarding their gender, age and MLU are provided in (9).

(9) **Details children with SLI**

<table>
<thead>
<tr>
<th>ID</th>
<th>gender</th>
<th>age</th>
<th>MLU</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>M</td>
<td>6:00.24</td>
<td>2.1</td>
</tr>
<tr>
<td>02</td>
<td>F</td>
<td>4:09.08</td>
<td>2.2</td>
</tr>
<tr>
<td>03</td>
<td>M</td>
<td>6:01.16</td>
<td>2.4</td>
</tr>
<tr>
<td>04</td>
<td>M</td>
<td>6:02.10</td>
<td>2.5</td>
</tr>
<tr>
<td>05</td>
<td>M</td>
<td>6:07.22</td>
<td>2.8</td>
</tr>
<tr>
<td>06</td>
<td>F</td>
<td>5:03.07</td>
<td>3.2</td>
</tr>
<tr>
<td>07</td>
<td>M</td>
<td>6:00.10</td>
<td>3.3</td>
</tr>
<tr>
<td>08</td>
<td>M</td>
<td>6:00.13</td>
<td>3.4</td>
</tr>
<tr>
<td>09</td>
<td>M</td>
<td>6:01.26</td>
<td>3.5</td>
</tr>
<tr>
<td>10</td>
<td>M</td>
<td>4:08.21</td>
<td>3.7</td>
</tr>
<tr>
<td>11</td>
<td>F</td>
<td>5:01.02</td>
<td>3.7</td>
</tr>
<tr>
<td>12</td>
<td>F</td>
<td>5:01.04</td>
<td>3.9</td>
</tr>
<tr>
<td>13</td>
<td>M</td>
<td>8:01.17</td>
<td>4.2</td>
</tr>
<tr>
<td>14</td>
<td>M</td>
<td>4:07.20</td>
<td>4.4</td>
</tr>
<tr>
<td>15</td>
<td>M</td>
<td>5:04.28</td>
<td>4.4</td>
</tr>
<tr>
<td>16</td>
<td>M</td>
<td>5:11.22</td>
<td>4.4</td>
</tr>
<tr>
<td>17</td>
<td>M</td>
<td>6:01.13</td>
<td>4.4</td>
</tr>
<tr>
<td>18</td>
<td>M</td>
<td>7:00.18</td>
<td>4.6</td>
</tr>
<tr>
<td>19</td>
<td>M</td>
<td>7:01.26</td>
<td>4.8</td>
</tr>
<tr>
<td>20</td>
<td>M</td>
<td>7:04.19</td>
<td>5.7</td>
</tr>
</tbody>
</table>

### 4.2. MATERIALS

Each child was recorded at school for about half an hour, in the presence of one speech therapist and one investigator. This rendered representative transcripts of minimally 100 utterances each. During the recording the speech therapist held a conversation with the child while playing with toys or a picture book.

In order to study the phenomenon of object scrambling, I pulled from the transcripts all child utterances containing a verb, an object, and negation (niet or nie - 'not') or one of the following adverbs: *nu* ('now'), *nou* ('now'), *gisteren* ('yesterday'), *morgen* ('tomorrow'), *altijd*
('always'), *even* ('just', 'for a moment'), *eventjes* ('just', 'for a moment'), *ook* ('also'), *maar* (?), *weer* ('again'), *zo* ('this way'), *gewoon* ('just').

4.3. ANALYSIS

Since utterances with a verb, an object and an adverb or negation were not abundant, the data of all children were collapsed and analyzed as one group. Furthermore, objects were divided up into five different categories, namely pronouns, proper names, definite DPs, indefinites, and determinerless object nouns.

For each category the percentage of scrambled and unscrambled objects was calculated.

5. RESULTS

The results show that children with SLI do not have many problems with scrambling of referential objects. This is shown in (10):

<table>
<thead>
<tr>
<th></th>
<th>pronoun</th>
<th>proper name</th>
<th>definite DP</th>
<th>indefinite</th>
<th>determinerless</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>s</td>
<td>u</td>
<td>s</td>
<td>u</td>
<td>s</td>
</tr>
<tr>
<td>total</td>
<td>96%</td>
<td>*4%</td>
<td>-</td>
<td>-</td>
<td>33%</td>
</tr>
<tr>
<td></td>
<td>23/24</td>
<td>1/24</td>
<td>1/3</td>
<td>2/3</td>
<td>0%</td>
</tr>
<tr>
<td>negation</td>
<td>92%</td>
<td>*8%</td>
<td>-</td>
<td>-</td>
<td>50%</td>
</tr>
<tr>
<td></td>
<td>12/13</td>
<td>1/13</td>
<td>1/2</td>
<td>1/2</td>
<td>0%</td>
</tr>
<tr>
<td>adverbs</td>
<td>100%</td>
<td>0%</td>
<td>-</td>
<td>-</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>11/11</td>
<td>0/11</td>
<td>0/1</td>
<td>1/1</td>
<td>0%</td>
</tr>
</tbody>
</table>

(10) Table 5: *Object scrambling in the language of all 20 Dutch children with SLI*
Referential objects such as pronouns in obligatory contexts are correctly scrambled at a rate of 96%. The one utterance with an incorrectly unscrambled pronoun is given in (11) (again, in all utterances, the negation or the adverb and the object are bold-faced):

(11) ik wil niet die opeten  
    I want not that up-eat-inf  
    'I don't want to eat that one'

As for the definite DPs, there were only 3 in total, which makes it difficult to draw any definitive conclusions from them. One definite DP was incorrectly left unscrambled. This utterance is reproduced in (12):

(12) je heb niet de ziekenauto.  
    you have not the ambulance  
    'You don't have the ambulance'

The other unscrambled definite DP was correct, which is sometimes possible in Dutch, and reproduced in (13):

(13) en hij Boef heb ook een keertje ’t badje pepot gemaakt.
and he Boef has also a time the bath-DIM broken made

'And Boef broke the bath one time too'

The indefinite objects were all non-referential, and left correctly unscrambled. An example of a correctly scrambled referential object and of a correctly unscrambled non-referential object are provided in (14):

(14) **correctly scrambled referential full object**

a. de leeuw weet toch **de weg niet**

   the lion knows anyway the way not

   'The lion doesn't know the way anyway'

**correctly unscrambled indefinite full objects**

c. maar dan moet je **ook een wiel** maken.

   but then must you also a wheel make-inf

   'But then you must also make a wheel'

Nonetheless, just like the younger normal children, the children with SLI produce determinerless object nouns, none of which has scrambled. This is illustrated in (15):

(15) **non-scrambled determinerless object**

nou is **niet kaartje** kopen, he?

now is not ticket buy-inf huh

'He's not buying a ticket now, is he?'
In summary, Dutch children with SLI between the ages of 4;2 and 8;2 behave normally with respect to object scrambling, i.e. just like their normally developing age mates they scramble referential objects correctly, whereas younger Dutch normally developing children often fail to scramble them. On the other hand, 4-8 year old Dutch children with SLI differ from their age mates in that they produce determinerless object nouns, which remain unscrambled. This linguistic behavior resembles that of younger Dutch normally developing children.

6. DISCUSSION

The results presented in section 5 show that the predictions formulated in section 3 are borne out: Dutch children with SLI older than age 3 do not fail to scramble referential objects in obligatory contexts; children with SLI drop determiners; determinerless object nouns remain unscrambled.

A comparison with the findings of earlier studies (Schaeffer (1995) and Schaeffer (1997; 2000)) on object scrambling in normally developing Dutch child language render the suggestions in (16):

(16)  a) With respect to Interface Pragmatics 4-8 year old children with SLI are similar to their age mates: they do NOT lack the pragmatic "Concept of Non-shared Knowledge", contrary to normally developing 2/3-year olds. This indicates that pragmatic principles such as the Concept of Non-shared Knowledge develop as a function of age, rather than as a function of language developmental stage in both normally developing children and children with SLI.

   b) Syntactically, 4-8 year old children with SLI and normally developing 2/3-year olds are in the same grammar developmental stage: both groups often drop determiners in object nominal expressions with the
consequence that the objects remain unscrambled.

The suggestion that pragmatic principles such as the Concept of Non-shared Knowledge develop as a function of age, rather than as a function of grammar developmental stage is consistent with findings reported by Skarakis and Greenfield (1982) who studied presuppositional ability in children with SLI. They found that whereas the (younger) MLU controls showed a pattern of omitting old information at lower MLU levels and pronominalizing such information at higher levels, the (older) children with SLI showed a tendency to pronominalize at all levels of MLU.

The fact that Dutch children with SLI between the ages of 4;2 and 8;2 are (morpho-)syntactically similar to, but pragmatically different from normally developing Dutch 2/3-year olds provides support for the hypotheses that Interface Pragmatics is a system independent of the Computational System, and that children with SLI have deficiencies in the grammar module, but not in Interface Pragmatics.

As for the first hypothesis: since the children with SLI display similar morphosyntactic anomalies as 2/3-year old normally developing children, we can assume that they are in the same "grammar developmental stage", or that they have the same "language age". However, they behave differently with respect to an interface pragmatic principle, namely the Concept of Non-Shared Knowledge. This suggests that the development of Interface Pragmatics is not tied to the development of the Computational System or the grammar. Rather, it is an independent device, developing at its own pace.

Regarding the second hypothesis: children with SLI make similar morphosyntactic errors to much younger normally developing children, such as determiner drop. However, such errors are no longer observed in the language of their age mates. This suggests that children with SLI are impaired, or at least delayed, in terms of their grammar. However, just like their normally developing age mates, children with SLI between the ages of 4;2 and 8;2 perform adultlike in
areas of syntax that depend on interface pragmatic principles, such as object scrambling, indicating that their Interface Pragmatics is not impaired.

7. CONCLUSION

In this study I have shown how a linguistic theoretical approach such as the one described in (1) can guide research in the field of SLI. Distinguishing Pragmatics from the Computational System allows us to tease apart morphosyntactic phenomena that are purely grammatical - such as determiner drop - on the one hand and syntactic phenomena driven by pragmatics - such as object scrambling - on the other hand, and therefore to investigate them separately. The differences in results regarding the two types of morphosyntactic phenomena in children with SLI are explained by the fact that they are driven by two different language components: one by grammar only, the other by pragmatics. Thus, the findings of this study of Dutch children with SLI provide support for a model of language as in (1).

In addition, the results of the present study support an analysis of object scrambling that is based on referentiality as the driving feature. In pragmatically mature populations, such as normal adults and children with SLI between the ages of 4;2 and 8;2 referentiality marking is no problem, because the knowledge of the independence between speaker and hearer knowledge is in place (Concept of Non-shared Knowledge). Therefore, object scrambling takes place correctly. However, in pragmatically immature populations, such as 2/3-year old children, object scrambling often fails to take place, because referentiality marking is a problem, due to the absence of the Concept of Non-shared Knowledge.

Concluding, I have shown how theories of the organization of language and syntactic theory are useful guides in the research of Specific Language Impairment, and vice versa, how results of SLI studies can help refine such theories. An interesting continuation of this line of research would include populations with other disorders, such as high-functioning autistic children, who have difficulties with pragmatics, but perhaps not with grammar. If, for instance,
we find that (Dutch-speaking) autistic children have problems with scrambling but show no errors with respect to purely grammatical phenomena this would provide a double dissociation between grammar and pragmatics, which is what we would want to see, ultimately (cf. Ben Shalom, this volume).
REFERENCES


LIST OF FIGURE/TABLE CAPTIONS

Table 1: Proportions of unscrambled referential objects (pronouns) in spontaneous Speech

Table 2: Proportions of unscrambled referential objects in elicited production task

Table 3: Proportions of scrambled and unscrambled determinerless object nouns in Dutch spontaneous child speech

Table 4: Percentage of scrambled and unscrambled determinerless object nouns in elicited production task with Dutch children

Table 5: Object scrambling in the language of all 20 Dutch children with SLI
b. maakt hij nou **niet meer # een botsing**. (ID 19, age 7;2, MLU 4.8)
makes he now not anymore a crash
'He doesn't crash anymore'

d. en e buurvrouw van ons heb **ook een tuin**.
(ID 11, age 5;1, MLU 3.7)
and a neighbor of us has also a garden
'And one of our neighbors also has a garden'

e. moet **even een boom** opzoeken (ID 19, age 7;2, MLU 4.8)
must for-a-moment a tree up-search-inf
'(Subject) need to look for a tree for a moment'

f. dan **weer een berg** maken (ID 18, age 7;1, MLU 4.6)
then again a mountain make-inf
'Then (we'll) make a mountain again'

g. gaat hij niet bijten hoor, als jij **niet kleine** opeet
(ID 12, age 5;1, MLU 3.9)
goes he not bite-inf 'hoor' if you not little up-eat
'He's not going to bite if you don't eat the little one'

c. mag eerst **nu wel [k]aartje [k]open** (ID 17, age 6;1, MLU 4.4)
may first now yes ticket buy-inf
'(Subject) can buy a ticket first now'
d. nee, hij heeft ook slang (ID 9, age 6;2, MLU 3.5)
no he has also snake
'No, he has a snake too'

e. jij heb ook stapel (ID 6, age 5;3, MLU 3.2)
you have also pile
'You have a pile too'
1 Niek is known to be a slow-developing child in terms of language.