Input and interaction in deaf families
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9 STRUCTURAL ASPECTS IN INPUT AND OUTPUT

In Chapter 8 the focus was on functional aspects of the input and output. In that context some attention was also paid to form, in particular in relation to function. Some aspects of form were different in the input from what might be expected. In this chapter we will pursue the discussion of form structure in the SLN, NL and SC utterances. Section 9.1 concentrates on the MLU's of the different languages. In section 9.2 we will look at the data on the realization of verbs and in 9.3 at verb positions. The realization of arguments is presented in section 9.4 followed by section 9.5 on the inflection of verbs. Section 9.6 deals with morphological markers. The use of function words (in NL and SC) and sign classes in SLN is described in section 9.7. Section 9.8 discusses whether or not there is structural evidence for SLN and NL in the input. All sections will be summarized in section 9.9.

9.1 MLU and MLUL10

The mean length of sentences is generally considered one of the indications of the developmental stage a child is in during the process of language acquisition. The mothers' input is usually slightly ahead of their children's in term of length, as has been often established in the literature (e.g. Snow 1994). This is generally interpreted as the input acting as a stimulus to growth in the child. In section 7.1.1 we described how the mothers and children produced many deictic signs in combination with a representational sign and/or word. Combinations of signs, or words, indicate SLN or NL syntax. We found that the deaf mothers offered the deaf children mainly sign combinations and hardly any word combinations. With the hearing children there were word and/or sign combinations, but fewer sign combinations. These findings will of course be reflected in the MLU of SLN and NL of the deaf mothers, and in the third language mode, Simultaneous Communication (as defined in Chapter 5). On the basis of the findings in Chapter 7 and 8 we might expect that the SC used by the mothers and the deaf children will be structurally different form the SC used by the mothers and the hearing children. This is important to explore, since we want to find out whether or not the SC used with and produced by the children may be considered to be a 'third system' as defined by Romaine (see also Chapters 1 and 2).

We will use both the Mean Length of Utterance (MLU words) and the Mean Length of 10 Longest Utterances (MLUL10). The latter gives us an impression of the
longest structures the mothers and children use. We are especially interested in where development can be seen, and furthermore we will compare the data of our subjects to the literature. We will clearly make comparisons between the input and the output, where we expect that the input will have a higher MLU than the output (question 21 in section 3.5).

Method
We calculated the MLU’s in signs for SLN and in words for NL by dividing the number of signs/words (including POINTS) by the number of utterances. The MLU for SC was analyzed in three different ways: once for the SC utterances as a unit (SC-MLU), once for the signed parts of SC utterances (MLU-s) and once for the spoken parts of the SC utterances (MLU-w). One important aspect for the count of SC utterances as a unit is that signs and words that are uttered simultaneously are counted in two ways. If the semantic content of the sign and the word is the same, the sign/word combination is counted as one element. If the content is not the same, the sign and word are counted separately.¹

9.1.1 MLU’s in the input
We already know that the deaf mothers of the hearing children offer them hardly any SLN (section 5.1) and only few multi-sign combinations (section 7.1.1) in SLN. We therefore only present the SLN-MLU of the deaf mothers to the deaf children (Table 9.1).

<table>
<thead>
<tr>
<th>INPUT to DC</th>
<th>1;0</th>
<th>1;6</th>
<th>2;0</th>
<th>2;6</th>
<th>3;0</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCarla</td>
<td>-</td>
<td>1.1</td>
<td>1.3</td>
<td>1.3</td>
<td>1.6</td>
</tr>
<tr>
<td>MLaura</td>
<td>1.2</td>
<td>1.5</td>
<td>1.7</td>
<td>1.9</td>
<td>2.0</td>
</tr>
<tr>
<td>MMark</td>
<td>1.4</td>
<td>1.2</td>
<td>2.2</td>
<td>1.9</td>
<td>1.4</td>
</tr>
</tbody>
</table>

With the deaf children the SLN-MLU ranges between 1.1 and 2.2. With Carla and Laura there is a slight increase over time. With Mark the MLU is highest at age 2;0 and afterwards decreases. At 3;0 this may be caused by the fact that Mark was uncooperative during the session (see section 4.3). However, it may also be due to an increasing use of morphological markers, which can reduce the number of signs in an utterance.² We will discuss these aspects further in sections 9.3 and 9.5. The MLUL10 for SLN with the deaf children ranges from 1.3 to 4.2 and increases as the children grow older.³ Although a comparison across languages of MLU’s cannot be

¹ see Appendix to Chapter 9, Procedures for a detailed description of the calculations, page 286
² I thank Heleen Bos for discussing these aspects with me.
³ see Appendix to Chapter 9, Table A9.1, page 289
made, it is interesting to see that Kantor (1982:139) found for two deaf mothers the following MLU's (in signs) in ASL with their deaf children:

- age 1;0 MLU 1.6
- age 1;8 MLU 1.7
- age 2;6 MLU 2.4

These are slightly higher than the SLN-MLU's produced by the mothers in our study.

In the Dutch input the deaf mothers have a mean NL-MLU of 1.7 with their deaf children, and we see no development. Gregory and Barlow (1986) found that deaf mothers with their deaf children produce MLU's (in words) of English of 1.75, 1.36 and 1.11 at ages 2;0, 2;6 and 3;0 respectively. The hearing mothers in their study had MLU's over 3. A low MLU appears to be characteristic for the spoken language of deaf mothers to their young deaf children.

With the hearing children there is no clear development in the NL-MLU of the deaf mothers either (see Table 9.2).

Table 9.2: INPUT HC: NL-MLU of the deaf mothers with the hearing children

<table>
<thead>
<tr>
<th>INPUT HC</th>
<th>1;0</th>
<th>1;6</th>
<th>2;0</th>
<th>2;6</th>
<th>3;0</th>
</tr>
</thead>
<tbody>
<tr>
<td>MJonas</td>
<td>2.1</td>
<td>2.2</td>
<td>(3.1)</td>
<td>(1.4)</td>
<td>2.3</td>
</tr>
<tr>
<td>MAlex</td>
<td>1.8</td>
<td>1.3</td>
<td>1.7</td>
<td>1.7</td>
<td>1.3</td>
</tr>
<tr>
<td>MSander</td>
<td>2.1</td>
<td>1.6</td>
<td>(1.9)</td>
<td>(1.7)</td>
<td>1.9</td>
</tr>
</tbody>
</table>

*Brackets indicate that 10 or fewer NL utterances are produced

If Tables 9.2 and 9.3 are compared, we can see that the NL-MLU's of the deaf mothers remain below those found for Dutch hearing mothers with their hearing children in the studies of Wijnands (forthcoming), Gilles and Verlinden (1988:21) and van de Weijer (in press).
Either the deaf mothers are not very skilled in Dutch or they prefer to use simple Dutch. As we did not make an analysis of the mothers' spoken Dutch used with hearing adults, we cannot give an assessment of their spoken language skills. The MLUL10 for Dutch input to the HC is even further below the norm of Dutch mothers with hearing children, and it actually decreases over time. We find a range of 2.8 (age 1;0) to 1.3 (age 3;0).5 Taking this result together with the finding (Chapter 5) that the amount of Dutch input also decreases over the period studied (Figures 5.1a-f), we must conclude that Dutch becomes less important and less complex in the input to the hearing children. We may expect that this can have an effect on the acquisition process of the hearing children.

Summarizing, the SLN input shows a minimal increase in MLU, and the Dutch input shows no increase in length with time. This picture may be different for SC, since this is the most frequent form of input to both groups of children. We do indeed find an increase of MLU in the SC utterances (see Figure 9.1).6

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5 see Appendix to Chapter 9, Table A9.3, page 290
6 see Appendix to Chapter 9, Table A9.4, page 290
We can see a development in the SC-MLU of the deaf mothers, both with the deaf and with the hearing children. The SC-MLU with Jonas and Sander is at all times slightly higher than with the deaf children and Alex. This is also the case with the ranges of the MLUL10 of the SC utterances, except with Alex at ages 1;0 and 3;0. On the whole the SC-MLUL10 in the input to the hearing children is higher (3.5 - 10.6) than in the input to the deaf children (2.6 - 7.5).

To see whether the higher SC-MLU is caused by multi-sign or multi-word parts, we will next look at the MLU-s (the signed parts) and the MLU-w (the spoken parts) of these utterances (see Figures 9.Ila and 9.IIb).

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7 see Appendix to Chapter 9, Table A9.5, page 290
8 see Appendix to Chapter 9, Table A9.6, page 290
Figure 9.1a INPUT DC+HC : Development in MLU-s of the deaf mothers with the deaf and hearing children

We find that both with the deaf and the hearing children there is a development in the MLU-s, which is slightly higher with the deaf children. It is interesting to see...
that the MLU-s with the deaf children is higher than the SLN-MLU (see Figure 9.1). In Chapter 7 we examined combinations and found these in SLN and SC. This result shows that the longest utterances are usually offered in SC with the deaf children. The MLU-s with the hearing children is higher than 2.0 after age 2:0, which confirms that multi-sign combinations are used fairly regularly in their SC input.

The MLU-w remains more or less the same with Alex, it increases with Sander, and is inconsistent with Jonas. We can see a small development with the deaf children, even though it remains below 2.0. This means that also in the SC utterances the deaf children are not offered long word combinations often. The MLU-w with the hearing children is higher than with the deaf children. Also, the MLU-w in the SC utterances offered to the hearing children is at all times higher than the NL-MLU. The longest utterances are thus offered in SC, simultaneously in two modalities (see also Chapter 5). However, the emphasis is different for the deaf and the hearing children, namely on signs with the deaf children and on words with the hearing children. In the next section we will see how these input data influences the output of the children.

9.1.2 MLU's in the output
We present the SLN-MLU's of the deaf and hearing children in Table 9.4.

<table>
<thead>
<tr>
<th>OUTPUT</th>
<th>Children</th>
<th>1:0</th>
<th>1:6</th>
<th>2:0</th>
<th>2:6</th>
<th>3:0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deaf Children</td>
<td>Carla</td>
<td>-</td>
<td>1.2</td>
<td>1.1</td>
<td>1.6</td>
<td>1.8</td>
</tr>
<tr>
<td></td>
<td>Laura</td>
<td>(1.0)*</td>
<td>(1.0)</td>
<td>1.4</td>
<td>2.0</td>
<td>1.8</td>
</tr>
<tr>
<td></td>
<td>Mark</td>
<td>0</td>
<td>1.5</td>
<td>1.5</td>
<td>2.3</td>
<td>2.3</td>
</tr>
<tr>
<td>Hearing Children</td>
<td>Jonas</td>
<td>0</td>
<td>1.0</td>
<td>(1.0)</td>
<td>(1.2)</td>
<td>(1.0)</td>
</tr>
<tr>
<td></td>
<td>Alex</td>
<td>(1.0)</td>
<td>(1.0)</td>
<td>0</td>
<td>(1.0)</td>
<td>(1.0)</td>
</tr>
<tr>
<td></td>
<td>Sander</td>
<td>(1.0)</td>
<td>1.0</td>
<td>1.1</td>
<td>1.3</td>
<td>1.4</td>
</tr>
</tbody>
</table>

* Use of brackets indicates that fewer than 10 SLN utterances were produced.

The SLN-MLU of the deaf children ranges between 1.1 and 2.3, which is almost exactly the SLN-MLU of the input of their mothers. However, the three deaf children show a clear development over time unlike the input. The MLUL10 of the deaf children ranges from 1.1 to 3.99 and also increases over time. The MLUL10 of the deaf children is comparable with the MLUL10 for SLN in the input (see 9.1.1). The deaf children produce multi-sign SLN increasingly as they grow older. The mothers do not clearly have a stimulating role, since the development appears to run parallel in time.

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9 see Appendix to Chapter 9, Table A9.7, page 291
The hearing children produce SLN-MLU's between 1.0 and 1.4, and there is hardly any development over time. MLUL10 for SLN is 1.5 at the most. As we found that the mothers offer almost no multi-sign SLN to the hearing children, we can conclude that the input is reflected in the output of the hearing children.

We present in Table 9.5 some MLU's found for different sign languages, coming from various studies of children at comparable ages. For ASL Hoffmeister has studied one child, Kantor two children, Richmond-Welty and Siple studied two sets of fraternal twins, one set of deaf fraternal twins monolingual in ASL and one set of hearing fraternal twins who were raised bilingual-bimodal in ASL, English and combined signing and speaking.

<table>
<thead>
<tr>
<th>Study</th>
<th>Language</th>
<th>Age</th>
<th>MLU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hoffmeister 1978</td>
<td>ASL</td>
<td>2:5</td>
<td>1.9</td>
</tr>
<tr>
<td>Kantor 1982</td>
<td>ASL</td>
<td>1:0</td>
<td>1.0</td>
</tr>
<tr>
<td>Richmond-Welty &amp; Siple 1999</td>
<td>monolingual</td>
<td>2:0</td>
<td>1.8</td>
</tr>
<tr>
<td></td>
<td>ASL</td>
<td>2:0</td>
<td>3.0</td>
</tr>
</tbody>
</table>

Although we cannot compare the SLN-MLU's to the MLU's of these other sign languages, we do see that the most development takes place between the age of 2;0 and 3;0 and not earlier. This can also be observed in the children in this study.

We already know that the deaf children produce no combinations in NL (see section 7.1.3). This is of course reflected in their MLU's for Dutch - never more than 1.0. In Table 9.6 we present therefore only the NL-MLU in the Dutch output of the hearing children.

<table>
<thead>
<tr>
<th>HC</th>
<th>1:0</th>
<th>1:6</th>
<th>2:0</th>
<th>2:6</th>
<th>3:0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jonas</td>
<td>(1.0)</td>
<td>1.1</td>
<td>1.7</td>
<td>2.3</td>
<td>2.1</td>
</tr>
<tr>
<td>Alex</td>
<td>(1.0)</td>
<td>1.1</td>
<td>1.4</td>
<td>2.4</td>
<td>1.5</td>
</tr>
<tr>
<td>Sander</td>
<td>(1.0)</td>
<td>(1.0)</td>
<td>1.2</td>
<td>(1.2)</td>
<td>1.7</td>
</tr>
</tbody>
</table>

*Use of brackets indicates that fewer than 10 NL utterances were produced*
The hearing children's NL-MLU develops over time. It ranges between 1.0 and 2.4, which is slightly higher than the mothers' NL-MLU (highest was 2.2 - see table 9.2). This means that the children's Dutch develops despite the fact that their mother's input becomes simpler over time. Of course, the hearing children also interact with other hearing members in their families, which has an influence on their spoken language acquisition. The deaf mothers' NL-MLU was lower than that of hearing mothers of hearing children, and we see that the children's NL-MLU's in interaction with their deaf mother are also lower than the MLU's of hearing Dutch children (compare Tables 9.6 and 9.7).

### Table 9.7 MLU's and MLUL10 (in words) of Dutch hearing children at different ages

<table>
<thead>
<tr>
<th>Study</th>
<th>Age</th>
<th>MLU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gillis &amp; Verlinden 1988</td>
<td>1;6</td>
<td>3.2</td>
</tr>
<tr>
<td>1988: Maarten Legtenberg 1989: Daantje</td>
<td>1;11</td>
<td>3.8</td>
</tr>
<tr>
<td>2;0</td>
<td>2.5</td>
<td></td>
</tr>
<tr>
<td>2;6</td>
<td>2.7</td>
<td></td>
</tr>
<tr>
<td>3;0</td>
<td>5.5</td>
<td></td>
</tr>
<tr>
<td>V.d.Stelt 1993: Claire Fanny</td>
<td>1;6</td>
<td>3.2</td>
</tr>
<tr>
<td>Schlichting 1996 (p.178)</td>
<td>2.0</td>
<td>1.1</td>
</tr>
<tr>
<td>n=20 for all ages</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1;6-2;0</td>
<td>1.3</td>
<td></td>
</tr>
<tr>
<td>2;0-2;6</td>
<td>1.9</td>
<td></td>
</tr>
<tr>
<td>2;6-3;0</td>
<td>2.6</td>
<td></td>
</tr>
<tr>
<td>MLUL10:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schlichting 1996</td>
<td>± 1;1</td>
<td>2.7</td>
</tr>
<tr>
<td></td>
<td>± 2.4</td>
<td>3.39</td>
</tr>
<tr>
<td></td>
<td>± 2;10</td>
<td>5.48</td>
</tr>
</tbody>
</table>

We must bear in mind of course that the spoken Dutch produced in interaction with their deaf mothers may not be representative of their Dutch produced in interaction with other hearing persons. They probably adapt their Dutch to the hearing status of their mother in that they leave out certain words which they might have produced when speaking to a native speaker of Dutch (see also Chapter 6).

The NL MLUL10 for the hearing children ranges between 1.2 and 3.1. It is larger than their mothers' and increases as they grow older whereas their mothers' MLUL10 decreased. So while Dutch contains less often multi-words in the input as the children grow older, the children's use of multi-word utterances in Dutch increases. Schlichting (1996:176) found MLUL10's for Dutch hearing children of hearing parents which are higher than what the hearing children produced in interaction with their deaf mother.

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10 We cannot compare to the data in GRAMAT (Bol and Kuiken 1988) because MLU was measured in morphemes.

11 see Appendix to Chapter 9, Table 9.8, page 291
Since the deaf mothers mostly offer multi-sign or multi-word utterances in SC, we may expect that the children will also have a high MLU in their SC utterances. This is in fact the case. In Figures 9.111a and 9.111b we present the SC-MLU’s of the deaf and hearing children respectively (the SC utterances here are taken as a unit). Not all children produce SC utterances at all points in time.

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12 See Appendix to Chapter 9, Table A9.9, page 291
The deaf children show an increasing SC-MLU over time, even though the actual number of SC utterances is low. Laura and Mark have a SC-MLU over 2.0 after age 2;6. The hearing children also show an increase in SC-MLU up to age 2;6, with continuing increase with Jonas at 3;0. Even though the deaf children produce far fewer SC utterances than the hearing children (Chapter 5), development in SC can be observed, although the SC-MLU of the hearing children is larger at 3;0. The SC-MLUL10 of the deaf children could only be established for Carla (1.2 – 2.8). The SC-MLUL10 of the hearing children ranges between 1.5 – 7.513 which indicates a more complex development in general, but which is also linked to the fact that they produce more SC than the deaf children.

With the mothers (compare Figure 9.1) we found that the longer SC-MLU with the deaf children was caused by more multi-signed parts of SC utterances (measured in MLU-s), while with the hearing children MLU-w was higher, especially so with Jonas and Sander (H) (compare Figures 9.IIa and 9.IIb). We have made the same analysis for the deaf and hearing children, and present these data in Figures 9.IVa and 9.IVb.14 We present the mean percentages, because the deaf children have so few SC utterances in all.

![Graph showing development of MLU-s and MLU-w for deaf children](image)

**Figure 9.IVa OUTPUT DC: Development of MLU-s and MLU-w of the deaf children**

13 see Appendix to Chapter 9, Table A9.10, page 291
14 see Appendix to Chapter 9, Table A9.11, page 292
For all children we see a development over time in the different MLU's. For the deaf children it is clear that the larger SC-MLU is caused by a larger MLU-s from age 2;0 on, and that there is no development in their MLU-w. The hearing children produce a higher MLU-w than MLU-s in their SC utterances. It is interesting that up to age 1;6, the MLU-s is more or less the same for all children (around 1.0). At age 2;0, however, differences appear both in MLU-s and MLU-w between the deaf children and the hearing children. The deaf children's MLU-s in general increases. The MLU-s of the hearing children also increases, but the MLU-w of the hearing children increases more steadily and more rapidly, despite the fact that their mothers' MLU-w remained the same over time. All this indicates that after age 2;0 the development of the deaf and hearing children, at least in using SC, starts to differentiate. The deaf children focus on the signing, and the hearing children on the words. This point in time corresponds with the developmental pattern of visual attention-giving behavior (see Chapter 6). Around this time the children have learned the appropriate attention-giving behavior belonging to either a spoken language or a signed language, which may influence their own language production.

We can summarize this section by saying that the deaf children mainly show a development in SLN or sign-based SC, which is a reflection of their input. Signed input had the longest MLU in SC, and the deaf children reflect the use of signing in their own production of SLN and SC. The MLU of the spoken parts in the SC input is never higher than two. Therefore it is not surprising that the acquisition of Dutch, or of word-combinations in a SC context shows no development in the output of the deaf children. And apart from the fact that complex Dutch or spoken parts in SC...
utterances hardly occur, we have to take into consideration that the deaf children
can only process the spoken or mouthed words visually. These two factors can
explain why there is no spoken development.
The hearing children mainly show development in NL and word-based SC, which is
not really a reflection of the input offered to them. The hearing children are
presented with multi-signed parts in SC input, and do show some development in
their own signed SC production, especially after age 2:6. However, their
development in Dutch and in the spoken SC is much more evident and once again
confirms that hearing children of deaf parents focus on the spoken words. In general
the hearing children seem to be slightly ahead in their development of language
than the deaf children.

9.2 Realization of verbs

In this section we will look at the realization of verbs in the analyzable SLN, NL
and SC utterances. In section 7.1.1 (combinations of representational signs and
words to deaf and hearing children) and section 9.1 (variation in MLU in input) we
have begun to establish what syntactic input is available in SLN, NL and SC
utterances on the basis of which the children can acquire the syntactic rules of a
particular language. The use of the verbal system in a language is a useful tool to
start exploring the syntactic system in more depth. We will therefore first look at
how many verbs are produced in SLN, NL and SC utterances in input and output
(question 22 in section 3.5).

Method
Firstly, we distinguish utterances without a verb and utterances with a verb in SLN
and NL and in the signed and spoken parts of SC utterances. The presence or
absence of a verb has different implications in SLN and NL. Dutch has a copula and
SLN has not. Omission of the copula in an obligatory context in NL and SC
utterances yields an ungrammatical utterance and points to an influence of SLN.
Furthermore, Dutch has many auxiliary verbs which are used extensively (see ANS
1984; Schlichting 1996), whereas SLN only has a few. These few are used in
various ways and differently from NL (see Bos 1994; forthcoming). The omission of
auxiliary verbs in NL utterances and in the spoken parts of SC utterances again
would indicate the influence of SLN syntax. Examples of grammatical and
ungrammatical utterances are given in Procedures.

Procedures
For this analysis only analyzable utterances were used (see for definitions
section 4.4.2). This causes some difference in the total number of utterances
per language in comparison to data used in section 9.1 (for MLU, where
utterances coded as 'Points alone' were included). All SLN, NL and SC
Structural aspects in input and output

utterances without a verb and containing a verb were analyzed, also one-
sign/word utterances consisting of a verb only.

• Our first step is to look at the SLN and NL utterances. The SLN utterances
are analyzed in the same way as the signed parts in the SC utterances (see
below), the NL utterances the same as the spoken parts in the SC utterances
(see below).

• Our second step is to distinguish four categories for the SC utterances:
  1. no verb in the signed part, no verb in the spoken part (Vsln-Vnl-)
  2. a verb in the signed part, no verb in the spoken part (Vsln+Vnl-)
  3. no verb in the signed part, a verb in the spoken part (Vsln-Vnl+)
  4. a verb in the signed part and a verb in the spoken part (Vsln+Vnl+)

All SLN, NL and SC (signed and spoken parts) utterances were then
subdivided in three categories:

1 grammatical:
   a) a verb is present, e.g.
      SLN POINTtij BOEK PAKKEN
      POINTyou BOOK FETCH
      NL wil je drinken?
      want you drink?
      SC POINTboek KIKKER
      dat is een kikker
      POINTbook FROG
      that is a frog

   b) no verb is necessary (SLN and signed part of SC only)
      SC JONGEN GROOT
      BOY TALL

2 ungrammatical:

For this analysis we consider an utterance to be ungrammatical only when
obligatory verbs are omitted. We do not analyze whether or not the right form
of the verb is produced, or whether for instance function words are left out in
an utterance. These analyses will be done in sections 9.5 and 9.6.

   c) a copula is omitted (NL only)
      NL konijnje zacht
      rabbit soft

   d) an auxiliary verb is omitted (NL only)\(^\text{15}\)
      NL jij drinken?
      you drink?

   e) other verb omitted
      SLN POINTtij BOEK
      POINTyou BOOK

\(^{15}\) Whether or not SLN has auxiliary verbs and if so how they are to be applied is currently being studied by Heleen Bos (forthcoming).
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NL  *jij boek*
    you book

3 other:
f) one sign/word or one constituent
   NL  *gele ring*  (yellow ring)

We do not look at the grammaticality of utterances of one sign and/or word if it does not consist of a verb, because in relation to the development of verb use these are not relevant. Utterances consisting of one (spoken and/or signed) verb were analyzed according to the grammatical/ungrammatical distinction. Ellipsis was not considered in this analysis. Roelofs defines ellipsis as "an utterance without (part of) a predicate of without obligatory arguments" (1998:66). There is no information available on ellipsis in SLN or SC. Ellipsis in Dutch is described in ANS (1984:794) for adult users. However, no studies are known on the use of ellipsis in parent-child interaction in Dutch (but see Roelofs 1998; Blankenstijn and Scheper forthcoming).

9.2.1 Presence of verbs in the input

The relatively high percentage of nouns in the input (see section 7.2.1), already suggested that there might be a low proportion of utterances containing a verb in SLN, NL and SC utterances if the utterances are not so long. Also, we demonstrated in section 7.1.1 and in section 9.116 that only 3% of SLN input to the hearing children consisted of more than two representational signs, indicating a very low level of syntactic input. To the deaf children the mothers presented 13% of (potentially) syntactic NL input, however with a MLU below 2.5 (see Table A9.2). This leads us to expect few verbs in the SLN input to the hearing children and in the NL input to the deaf children.

**SLN and NL input**

Since the number of verbs in the input are small, we decided to pool the input data for the deaf and for the hearing children up to age 3;0.17 Individual variation will be mentioned if relevant for the discussion.

We found that of the SLN input offered to the deaf children only a third of the utterances (n=122, 33%) contains a verb. A slight increase over time in the use of verbs can be observed. Of the analyzable SLN utterances without a verb (n=246) 72% belongs to category 5 (one sign/one constituent), which was to be expected from the relatively low MLU (see section 9.1). The remaining utterances fall in category 1b (grammatical: no verb necessary).

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16 see Appendix to Chapter 9, Table A9.1 for SLN MLUL10 in the input to the hearing children, page 289

17 For individual data see Appendix to Chapter 9, Tables A9.12-A9.17, pages 292-293
With the hearing children verbs are used too (n=29, 47%), but per session fewer than 10 SLN utterances in total are offered. The deaf mothers proportionally use more SLN verbs with the hearing children (47%) than with the deaf children (33%), but this difference may be due to the low numbers. The mothers offer 33 SLN utterances without a verb; 79% consist of one sign/one constituent, and in the remainder no verb is necessary.

NL utterances with a verb are only really used with the hearing children (n=137, 49%). A decrease in the use of NL verbs can be observed in the input to Jonas and Alex, an increase in the input to Sander. There are only 3 spoken verbs offered to Laura (D) and none to the other deaf children, so we will not further discuss the NL input to the deaf children.

Of the 144 NL utterances without a verb offered to the hearing children 91% consist of one word/one constituent (see also NL-MLU in section 9.1.1). The remaining input consists of NL utterances where a copula, an auxiliary or a main verb is omitted. We see that the NL input to the hearing children is predominantly very simple and sometimes grammatically incorrect (5%) with regard to presence of verb.

SC input

In Figures 9.Va-f18 we present the SC input of the deaf mothers, subdivided in SC utterances without a verb (VSln-Vnl-) and SC utterances with a verb, according to the modality in which a verb occurs.

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18 See Appendix to Chapter 9, Tables A9.18 - A9.23, pages 293-294
Realization of verbs

Figures 9.Va-f  INPUT DC+HC: SC utterances without and with a verb in the input of the deaf mothers
SC utterances without a verb (Vsln-Vnl-) form the largest category for all mothers. Many of these SC utterances consist of one spoken or one signed word/constituent. A typical example is (1):

(1) \textit{POINTtrein TREIN} (that is a train)  
\textit{trein}  
\textit{POINTtrain TRA\textsc{i}N}  
\textit{train}

In utterances such as these there is no verb in the signed part, which is fully grammatical, and one spoken word is uttered simultaneously with the lexical sign.

There are a few occasions (mean 2% or less) that a main verb is omitted as exemplified in (2).

(2) \textit{W\textsc{i}J\textsc{u}} \quad \textit{ANDERS}  
\textit{nu even wat} \quad \textit{anders ok}  
\textit{WE NOW ELSE?}  
\textit{now just something else ok}

Let's do something else now, ok?)

It is not certain that we are dealing here with an ungrammatical signed part - these utterances need to be studied further. In this example the verb 'doen' (to do) is omitted in the spoken part.

Ungrammatical spoken utterances are found on average in 12% of the SC input without a verb with the deaf children and in 18% with the hearing children. Commonly a copula, an auxiliary and/or a main verb are left out in the spoken part when no verb is needed in the signed part - these ungrammaticalities in the spoken parts seem likely to arise under the influence of the verbal structure of SLN.

On the whole we find that SC utterances without a verb, consisting of more than one sign or word, seem to be influenced by SLN syntax in that copulas and auxiliaries are not present, both with the deaf and with the hearing children. The spoken parts are clearly subordinate to the signed parts. This leads to more ungrammatical spoken parts with the hearing children than with the deaf children, simply because the mothers speak or mouth more with them than with the deaf children.

With the deaf children category Vsln+Vnl- (signed verb present) is small but increases over time. With the hearing children this category is also small but it

\footnote{19 \textit{see Appendix to Chapter 9, Tables A9.24 - A9.29, pages 295-296}}\footnote{20 \textit{see Appendix to Chapter 9, Tables A9.24 - A9.29, pages 295-296}}
remains more or less the same over time. A typical example is (3) (NB the verbs WASH and SCRUB are located on the picture of the doll in the book):

(3) [ML2;6]

\textit{OH LIEF POP BAD WASSEN}boek \textit{SCHROBBEN}boek
\textit{lief pop bad}

\textit{OHNICE DOLL BATH} WASHbook SCRUBbook
\textit{nice doll bath}

(Oh, the sweet doll is being washed and scrubbed in the bath)

With the hearing children category Vsln-Vnl+ (spoken verb present) is much larger than with the deaf children, even though it seems to be decreasing over time (see example (4). The deaf mothers differ individually. Jonas' mother uses this category decreasingly, Alex' mother mainly uses this category when Alex is 1;0 and the mother of Sander continues to use this category more or less to the same extent across the different points in time.

(4) \textit{TREIN}
\textit{daar gaat de trein}
\textit{TRAIN}
there goes the train
\textit{(there goes the train)}

Utterances like example (4) are used far more with the hearing children (mean 72%) than with the deaf children (mean 42%). This confirms the patterns found in the MLU section (9.1.1), where we saw that the emphasis in SC input lies on signs with the deaf children and on words with the hearing children (see also section 6.3.1).

The final category Vsln+Vnl+ (signed and spoken verb present) occurs in the input to all children. It is the second largest for all mothers, although there are individual differences (see Figures 9.Va-f). We can see no clear development in this category. A typical example is shown in (5):

(5) [MS2;6-utt. 62]

\textit{MENEER STERK 3aPAKKEN}1 KOGEL
\textit{meneer sterk pakt kogel}

\textit{MISTER STRONG 3aTAKE}1 CANNONBALL
\textit{mister strong takes cannonball}
\textit{(Mr. Strong picks up the cannonball)}

NB In this example we overlook the omission of the article before 'cannonball' with respect to grammaticality.
In conclusion we have found that the number of utterances with a verb varies considerably among the mothers in all modalities. The mothers use a signed verb in approximately a third of the SLN input with the deaf children and in 47% of the SLN input to the hearing children (but few instances). In spoken Dutch verbs are virtually only presented to the hearing children in about half of the NL input; some utterances (about 5%) are therefore ungrammatical. In SC input we find that the mothers offer the children many utterances without a verb (range = 37 - 93%) in either part. There is much individual variation. These SC utterances are under the influence of SLN. If a verb occurs in the SC input, it occurs most often in both parts. SC utterances with only a signed verb increase in the input to the deaf children and are rare in the input to the hearing children. SC utterances with only a spoken verb occur decreasingly in the input to the hearing children, and more so than in the input to the deaf children.

9.2.2 Presence of verbs in the output
In section 7.1.3 we found that the deaf children all combine representational signs (syntactic SLN) but no representational words (syntactic NL). We expect therefore only a few spoken verbs produced by the deaf children. The hearing children combine both signs and words and thus produce syntactic SLN and NL. In their output we therefore expect both signed and spoken verbs, despite a very low SLN-MLU (see section 9.1.2).

SLN and NL output
The deaf children in total produce 290 SLN utterances without a verb, which is 76% of the total SLN output. Of these, 44% (n=128) consist of one sign/constituent (category 5). They produce 154 utterances (53%) in which no verb is required (category 1). They also produce 7 utterances (3%) where a main verb is left out (category 4). This category was not found in the input. Compared to the input we find that in the output there is a higher percentage of category 1 (mainly labeling) utterances compared to category 5 (one constituent). The deaf children start producing signed verbs from about age 1;6 (n=4, 17%) and increasingly so, both in number and proportionally. At age 3;0 on average 35% of their SLN utterances contains a verb (n=50). Altogether they produce 92 utterances with a verb (see Table 9.8).

The hearing children produce in total 40 SLN utterances without a verb (61%), most of which consist of one sign, and there is one utterance where no verb is needed (cat.1). All three hearing children produce some signed verbs, but inconsistently over time, and to a small extent only. We see no development here.

The deaf children produce altogether 9 NL utterances, all without a verb (see Table 9.8), all of category 5 (one word/constituent). Since the input also contained hardly any spoken verbs, this was to be expected.

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21 see Appendix to Chapter 9, Tables A9.30 - A9.35 for full details, pages 296-297
The hearing children produce 220 NL utterances without a verb, which is 75% of the total NL output. Category 5 (one constituent) forms 88% of these utterances. In the remainder a verb is often omitted, namely a copula (7%), an auxiliary verb (3%) or a main verb (3%). The output reflects the input very closely in that it is very simple. In some cases a SLN influence might be interpreted in the omission of (obligatory) verbs, which renders the NL utterances ungrammatical.

Even though the hearing children produce only a few SLN utterances, proportionally these contain more verbs than the SLN output of the deaf children. The use of signed verbs may be triggered earlier in hearing children by the use of spoken verbs in NL utterances. However, the deaf mothers also have a slightly higher proportion of signed verbs in the input to the hearing children than to the deaf children, so partly this may be explained by the input that is offered (see section 9.2.1).

Jonas (H) and Sander (H) produce spoken verbs from the age of 2;0, and Alex (H) from age 1;6. In general there is an increase over time of the use of spoken verbs in the output, even though the numbers remain small. Together the hearing children produce 72 NL utterances with a verb. In Table 9.9 we present data that Schlichting (1996:119) found for utterances containing a verb phrase for monolingual Dutch hearing children. We include the data of our hearing children for comparison.
We see a steady increase in the use of verbs, both with the Schlichting children and with the hearing children of the deaf mothers. Our hearing children seem to produce more utterances containing a verb proportionally than the monolingual children up to age 2;6. However, we know that the hearing children also produce many SC utterances, so the comparison should be interpreted with care. It may be that when they produce a Dutch utterance, they are more inclined to use a verb phrase and that utterances not containing a verb occur more often in SC utterances, also under the influence of SLN.

In the next subsection we will take a look at the SC production of the children.

**SC output**

Most of the SC utterances produced by the deaf children are without a verb (mean 89% category Vsln-Vnl-). The deaf children produce no ungrammatical utterances as defined in this study, mainly because most utterances consist of one word/sign or constituents, which we did not analyze further. Carla and Laura together produce 7 SC utterances with a verb, 5 with a signed verb only, one with a spoken verb only, and one with a verb both signed and spoken. Since the number of SC utterances with a verb is so small in the output of the deaf children, we will not further discuss these.

With the hearing children category Vsln-Vnl- is 59%, a much lower percentage than with the deaf children. They produce many one-word/sign/constituent utterances. Jonas at 3;0 increasingly produces SC utterances consisting of two or more signs/words, and the percentages of ungrammatical spoken or signed parts also increase. We find that Sander produces simple SC, although he does produce a few (ungrammatical) longer NL parts. Both children at times omit a copula, auxiliary or main verb in the spoken parts. This may reflect an influence of SLN on the SC utterances without a verb, which was also present in the input. Alex produces only a few SC utterances (n=48 in total), and as these are all one word/sign utterances we will not further discuss them.

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22 see Appendix to Chapter 9, Tables A9.36-A9.41 for details, pages 298-299
23 see Appendix to Chapter 9, Tables A9.42-A9.47, pages 299-300
24 see Appendix to Chapter 9, Tables A9.42-9.47, pages 299-300
We present the actual number of utterances of the hearing children in Table 9.10. Since the number of utterances is so small, we emphasize that the following data are to be interpreted with care.

<table>
<thead>
<tr>
<th>Hearing children</th>
<th>1:0</th>
<th>1:6</th>
<th>2:0</th>
<th>2:6</th>
<th>3:0</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vsln+Vnl−</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Vsln-Vnl+</td>
<td>0</td>
<td>0</td>
<td>12</td>
<td>23</td>
<td>37</td>
<td>72</td>
</tr>
<tr>
<td>Vsln+Vnl+</td>
<td>3</td>
<td>8</td>
<td>20</td>
<td>22</td>
<td>118</td>
<td></td>
</tr>
<tr>
<td>Total SC+verb</td>
<td>3</td>
<td>21</td>
<td>44</td>
<td>63</td>
<td>131</td>
<td></td>
</tr>
</tbody>
</table>

The hearing children produce in total 131 utterances with a verb, with 60 (46%) signed verbs and 125 (95%) spoken verbs. Their SC input with a verb came to 706 utterances, with 460 signed verbs (65%) and 662 (94%) spoken verbs. There is a difference in the percentage of signed verbs in the output of the children compared to that in the input, but the percentage of spoken verbs matches that of the input. This points again to a focus on the spoken modality.

The hearing children produce 6 SC utterances with a signed verb only. This category was small in the input, and the children do not use it very often either. They produce 72 utterances with a spoken verb only (Vsln-Vnl+). This subset forms 54% of all SC output with a verb. In the input of the mothers this category was on average 20% and mainly used by the mothers of Jonas and Sander. The increasing use of this category confirms that the focus of the hearing children is on the spoken modality. The second largest category for the hearing children is Vsln+Vnl+, which is increasingly used, just as it is by the mothers.

In conclusion we find that the deaf children produce most of their utterances without a verb. This is a reflection of the input, but the children leave out more, also typical of acquisition. The utterances are usually fully grammatical. They only produce signed verbs, mostly in SLN utterances but also some in SC. Only a few obligatory verbs are omitted. Over time the children increase the number of signed verbs, both in number and proportionally. At age 3:0 about 35% of their SLN output contains a verb, which is very similar to the percentage of signed verbs in their input. Studies of the children at later ages should shed more light on the presence of signed verbs in their output.

The hearing children do not produce many signed verbs, and we do not see any development over time. Half of the SLN input of their mothers contained a verb, but obviously this is not picked up by the children. They do produce spoken verbs in NL increasingly over time, spoken verbs were presented to them in NL utterances, although many were omitted. They also produce verbs in SC utterances, the majority of which is spoken, or spoken and signed simultaneously. This reflects the
emphasis on the spoken modality by the hearing children, which was also found in other sections. Their mothers’ SC input also contained many spoken, or signed/spoken verbs, whereas SC utterances with only a signed verb were rare in the input.

In the next section we will focus on the realization of arguments in SLN, NL and SC utterances.

9.3 Realization of arguments

We know that SLN is a prodrop language, which means that under certain conditions subjects and objects can be omitted (Chapter 2). We will look at the (non-) realization of subjects and objects in the linguistic input and output. For this we will analyze only those SLN and SC utterances that contain a signed verb.

Dutch is not a prodrop language, which means that subject and obligatory objects must be realized. The subject can only be left out grammatically in imperative sentences, or when topic drop occurs (a.o. ANS 1984; Krämer 1995; Scheper et al. in press; Schlichting 1996). Obligatory objects must also be realized, unless topic drop occurs. There are two conditions under which topic drop can occur in Dutch. A structural condition, namely that it concerns the first person and a pragmatic condition that the topic is inferable from the context. The ANS gives the following example (6) for topic drop (1984:968):

(6) In 1981 ben ik hier komen wonen. [Ik] was inmiddels getrouwd en dan wil je wel een wat groter huis (sprektaal).
    (In 1981 I came to live here. [I] was married by then, and you would like to have a bigger house) (vernacular).

In parent-child interaction subjects and objects often linguistically refer to referents within the sight of the speaker and addressee (Schlichting 1996:56). Schlichting presents examples for subject drop and object drop by adult speakers (our examples (7) and (8)):

(7) past niet fits not ([it] doesn't fit) [referring to a piece of a jigsaw puzzle]

(8) heb ik om mijn nek geknoopt have I about my neck tied (I have tied [it] around my neck)

Utterances such as these are considered grammatical and are expected to occur regularly in mother-child interaction, which often deals with the here-and-now at the ages that we are studying (up to 3;0). The here-and-now character of the interaction makes subject and object drop 'easier' because the participants and/or materials are known and need not always be explicitly mentioned.
Krämer (1995) related the (non-)realization of subjects in child language also to finiteness. She found in young Dutch children that if subjects are realized, they will occur with a finite verb, and more subjects will be dropped with non-finite verbs. We will study the input and the output for spoken subject realization related to finiteness. We will analyze all NL and SC utterances with a verb for the correct (non-) realization of subjects and objects, and look at the finiteness of the verb in relation to subject realization.

In general we will consider here what arguments are realized in SLN, NL and SC utterances in the input and in the output of the children (research question 23 in section 3.5).

Procedures
For these analyses we studied all analyzable SLN, NL and SC utterances with a verb.

- For the SLN utterances we look at whether or not subjects and objects are realized. Subjects can be dropped in SLN. Obligatory and optional objects cannot be distinguished, since these aspects have not been studied yet. For SLN we will give percentages for presence or absence of objects.
- All NL utterances that contain a verb are coded for having a subject or for not having a subject, and for presence or absence of obligatory objects. We will look at whether subject and/or object drop occurs correctly or incorrectly. Utterances are considered correct when the subject is realized, or when the subject is not realized in imperative sentences or when topic drop occurs. Obligatory objects must always be realized, except in the case of topic drop.

Following Krämer (1995) we subsequently look at the finiteness of the verb, to see whether or not subjects are realized with finite verbs more often than with non-finite verbs. In the Appendix to Chapter 9 we present a list of all occurring verbs in the input and the output, categorized according to transitivity, and whether or not objects are obligatory or optional.

- For the SC utterances we have the following procedure: all SC utterances with a signed verb are analyzed for subject an/or object realization in two groups: those with a simultaneously spoken verb, and those without. All SC utterances with a spoken verb are analyzed in two groups, one with a simultaneously signed verb and one without. Additionally we looked at whether or not subject/object realization was correct (i.e. subject and obligatory object must be realized, unless topic drop occurs) and whether subject realization occurred with finite verbs.

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25 See Appendix to Chapter 9, page 301-305 for a list of the studied verbs
9.3.1 Realization of arguments in the input

Realization of arguments in SLN and NL with a verb

There are 122 SLN utterances with a verb in the input to the deaf children (see section 9.2.1). Subjects are dropped in 57% of these utterances (see Table 9.11). Where a transitive verb is used (n=64), objects are dropped in 58% of the cases. Of the 37 objects that are not lexically realized only six are expressed through classifier-incorporation into the verb (see section 2.3.1). Four verbs are spatial verbs, where the object can be expressed through choice of location, e.g. VINDENbal 'FINDball', where the verb is made on the real or localized ball. It is thus not often the case that lexical objects are dropped as a result of agreement occurring in the utterance - this occurs with only 16% of the transitive verbs.

In the input to the hearing children there are 29 SLN utterances with a verb and here all but three subjects are omitted. Eight transitive verbs are used with only one lexical expression of the object (BLOEM PLUKKEN 'FLOWER PICK').

Table 9.11 INPUT DC+HC: Number and (%) of Subject and Object drop in SLN utterances of the mothers

<table>
<thead>
<tr>
<th>SLN input of deaf mothers to</th>
<th>Total no. of utterances with a verb</th>
<th>Sdrop*</th>
<th>Odropb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deaf children</td>
<td>122</td>
<td>69 (57)</td>
<td></td>
</tr>
<tr>
<td>Hearing children</td>
<td>29</td>
<td>26 (90)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total no. of transitive verbs</th>
<th>Odropb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deaf children</td>
<td>37 (58)</td>
</tr>
<tr>
<td>Hearing children</td>
<td>7 (88)</td>
</tr>
</tbody>
</table>

*Percentages are from total number of SLN utterances with a verb
bPercentages are from total number of transitive verbs

The percentages of subject- and object drop are similar in the SLN input to the deaf children (around 57%) and also similar with the hearing children (around 88%). However, the fact that much more subject and object drop occurs with the hearing children is striking. Possibly the mothers make a distinction between SLN and NL in this respect which they feel they must emphasize with the hearing children (Sdrop and Odrop in SLN but not in NL). With the deaf children the need is less urgent, because they are offered hardly any Dutch. We will come back to this aspect in the discussion of the NL utterances with a verb.

Bos (1995) examined this aspect in adult SLN signing. She found that in 39% of adult SLN utterances the subject is not lexically expressed, compared to 63% of the objects (1995:136). She concludes that
Realization of arguments

[...] subjects often are expressed only lexically, and not in agreement whereas objects tend to be expressed through agreement. This preference for object agreement is mirrored in object-drop: there is more object-drop than subject-drop. (Bos 1995:137)

Compared to the percentages found by Bos, there is more subject-drop in the input to the deaf children (57% compared to Bos' 39%). Object-drop is comparable (58% to Bos' 63%). In section 9.5 we will see whether or not this difference in subject drop can be explained by agreement factors. Subjects can possibly be omitted more often because the discourse involves fewer topic shifts than in the stories told by the adults in Bos' data. The play-sessions also dealt mainly with here-and-now situations, where referents are present.

The NL input to the hearing children contains 137 utterances with a verb. Of these 93 are imperative sentences where no subject is required (68%). In the 44 remaining declarative or interrogative utterances subjects are realized in 23 cases (52%) and these all occur with finite verbs. (Subject) topic drop occurs in 32% (n=14), in more than half the cases with finite verbs. In only 7 NL utterances with a verb (16%) is the subject ungrammatically omitted, 4 times with a finite verb, and 3 times with a non-finite verb. We can say that the NL input to the hearing children mostly conforms to the rules of Dutch with respect to the realization of subject. The influences from the SLN rule of subject drop is apparently limited. There are only three utterances with a verb which take an obligatory object and these are all realized. On the whole it appears that the mothers follow Dutch rules for subject and object realization.

Realization of arguments in SC input with a verb

In Table 9.12 we present the percentages of dropped subjects and objects in SC utterances of the deaf mothers. The grammatical cases of subject or object drop in spoken imperative sentences or topic drop contexts are not represented in this table. Only the ungrammatical cases are counted; these are presented as a percentage of all SC utterances with a spoken verb.
### Table 9.12 INPUT DC+HC: Numbers and (%) of dropped subjects and objects with signed and spoken verbs in SC utterances of the deaf mothers with the deaf and hearing children

<table>
<thead>
<tr>
<th>SC utt.</th>
<th>Total no. of utterances</th>
<th>DMDC S drop</th>
<th>Total no. of utterances</th>
<th>DMHC S drop</th>
</tr>
</thead>
<tbody>
<tr>
<td>signed V</td>
<td>87</td>
<td>44 (51)</td>
<td>44</td>
<td>38 (86)</td>
</tr>
<tr>
<td>spoken V</td>
<td>35</td>
<td>11 (31)</td>
<td>246</td>
<td>38 (9)</td>
</tr>
<tr>
<td>signed V +</td>
<td>243</td>
<td>141 (58)</td>
<td>416</td>
<td>245 (59)</td>
</tr>
<tr>
<td>spoken V</td>
<td>*108 (44)</td>
<td></td>
<td>*79 (19)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total no. of transitive verbs</th>
<th>DMDC O drop</th>
<th>Total no. of transitive verbs</th>
<th>DMHC O drop</th>
</tr>
</thead>
<tbody>
<tr>
<td>signed V</td>
<td>46</td>
<td>3 (7)</td>
<td>24</td>
</tr>
<tr>
<td>spoken V</td>
<td>7</td>
<td>*4 (43)</td>
<td>23</td>
</tr>
<tr>
<td>signed V +</td>
<td>126</td>
<td>87 (69)</td>
<td>265</td>
</tr>
<tr>
<td>spoken V</td>
<td>51</td>
<td>*11 (22)</td>
<td>77</td>
</tr>
</tbody>
</table>

*Percentages are from total number of utterances with a verb

*bPercentages are from total number of transitive verbs

* = ungrammatical S- or O drop

In the category SC utterances with only a signed verb, the deaf mothers produce 87 with the deaf children, of these 46 are transitive signed verbs. With the hearing children 44 utterances have a signed verb, of which 24 are transitive verbs. The mothers drop more subjects than objects with both groups of children unlike the SLN utterances, but they drop more subjects and objects with the hearing children. This is the same as the finding with the SLN utterances, and may be a reflection of an emphasis.

In the category SC utterances in which only a spoken verb is produced, the deaf children are offered 35 of such utterances. In 16 (46%) the spoken subject is realized, mostly with a finite verb (94%). In total the subject is ungrammatically omitted in 11 utterances (31%). The mothers offer 7 transitive verbs, with 4 obligatory realized objects (57%).

With the hearing children the mothers produce 246 SC utterances with a spoken verb. In 172 utterances the subject is realized (69%), mostly with finite verbs (98%). Of those cases where the subject is dropped, 21 are imperatives and topic drop occurs in 30 utterances. In 23 utterances (9%) the subject is ungrammatically dropped. This is comparable with the figures for the NL utterances. 23 Transitive verbs are used with 17 lexically realized objects, whereas with three verbs object topic drop occurs. In 3 cases (13%) the object is ungrammatically left out, which is also comparable to the NL input. In these SC utterances then the mothers realize more subjects and objects with the hearing children than with the deaf children, which is contrary to what we found for the SC utterances with a signed verb. Realized subjects occur mostly with finite verbs, which was also found by Krämer for child Dutch (1995). In these SC utterances with a spoken verb only the mothers clearly follow the syntactic rules of Dutch (realize subjects and obligatory objects).
Lastly we look at those SC utterances where the signed verb is combined with a spoken verb.

The deaf children are offered 243 of these and in 58% the signed subject is dropped and in 44% the spoken subject, in the latter case ungrammatically. This reflects a considerable SLN influence on the spoken part of the utterance. (Spoken subjects are realized in 29 cases (12%), in 53% with a finite verb. In 49 (20%) cases we find spoken subject topic drop which is allowed in Dutch and in the remainder of the utterances no subject is expected.) There are 126 transitive signed verbs with 69% dropped objects. Spoken transitive verbs with an obligatory object total 51, with 11 cases (22%) of ungrammatically dropped objects. There are 20 (39%) realized objects. Object topic drop occurs with 20 verbs (39%).

The signed parts of the SC utterances are very similar to the SLN input to the deaf children, on average 55% percent of the subjects are dropped. The spoken parts seem to be under the influence of SLN syntactic rules, in that there is also a high percentage of subject drop (44%) in those utterances where both a signed and a spoken verb are present. In the SC utterances with only a spoken verb the percentage of subject drop is lower (31%) and we see less influence of SLN here. Object drop occurs often (69%) in the SC utterances with a signed and a spoken verb, but hardly in those SC utterances with only a signed verb (7%). The percentage for dropped objects in the spoken parts is quite high, but higher in utterances with only a spoken verb (43%) than in utterances with both a signed and a spoken verb (22%).

The hearing children are offered 416 simultaneously signed and spoken verbs. In the signed parts 59% of the subjects are dropped, comparable to the input to the deaf children. The mothers offer 265 transitive signed verbs with 117 (44%) dropped objects, which is less than with the deaf children (69%). Spoken subjects are dropped in only 19% of the SC utterances, far less than with the deaf children (44%). The SLN influence on the spoken parts seems to be less obvious here compared to the input to the deaf children. There are 174 realized spoken subjects (42%), the majority of which occur with a finite verb (93%) and there are 164 (39%) subjects dropped in permitted circumstances (imperatives or topic drop). The mothers offer the hearing children 77 spoken transitive verbs with 14 ungrammatically dropped objects (18%). So even though ungrammatical spoken parts also occur in the SC input to the hearing children, the structure that is offered in these spoken parts resembles spoken Dutch more than with the deaf children, especially regarding the realization of subjects.

In sum, we find that in SLN with the deaf children 57% of the subjects and 58% of the objects are dropped. These percentages are respectively higher and slightly lower than those found by Bos (1995) for adult-adult SLN (39% and 63%). With the hearing children these percentages are even higher (about 88%). The Dutch input to the hearing children showed only 16% of (ungrammatical) subject drop, and no obligatory object drop at all. The deaf mothers seem to make a distinction between
SLN and NL with respect to the realization of arguments, which is not apparent in the input to the deaf children.

We find this confirmed in the SC input to the children. With the deaf children the SC input appears to follow SLN rules. We find the same percentages for subject drop and object drop in the signed parts as in SLN. The spoken parts show less subject drop than the signed parts. However, the percentages for (ungrammatical) subject drop in the spoken parts are substantial (31% and 44%) so that we can speak of an influence of SLN rules here. With the hearing children the SC utterances appear to be comparable to the deaf children' input with regard to the signed parts: a high percentage of subject and object drop. But the spoken parts of the SC utterances are clearly much more Dutch-like. We find 9% and 19% of ungrammatical subject drop in SC utterances with a spoken verb only and in the utterances with a signed and a spoken verb, comparable to 16% of ungrammatical subject drop in Dutch. The percentages for object drop (13% with spoken verbs only and 44% with signed and spoken verbs) are comparable to subject drop, but still much higher than in the NL utterances. So only with respect to object drop we see an influence of SLN in the SC utterances in the input to the hearing children. Especially the utterances where both a signed verb and a spoken verb occur are different in the input: SLN-like with the deaf children and Dutch-like with the hearing children.

9.3.2 Realization of arguments in the output

Realization of arguments in SLN and NL with a verb

The deaf children produce 90 SLN utterances containing a verb. The deaf children drop the subject with 48 (53%) of these verbs, which is highly similar to the input (57%) (compare Table 9.11). Objects are omitted in 15 (44%) of the cases where a transitive verbs is used (n=34) – a somewhat lower percentage than in the input (58%).

The hearing children produce 25 SLN utterances with a verb, and in most of these the subject is dropped (88%) which comes very close to the 90% of dropped subjects in the input (see Table 9.11). Five objects (out of nine transitive verbs) are dropped. Compared to the SLN input the hearing children appear to omit the same percentage of subjects. Their production of transitive verbs is too small to draw conclusions upon.

Objects seem to be dropped less often than in the input; however, no conclusions can be drawn because of the low number of instances of transitive verbs.

The NL output produced by the hearing children contains 71 utterances with a verb, in which 38% of the subjects are realized, mostly with finite verbs (85%). There is one imperative sentence where the subject is correctly dropped. 41% of the subjects (n=29) are dropped correctly under topic drop conditions. This leaves 20% of incorrectly dropped subjects (n=14).

Schlichting (1996:94) found that hearing children of hearing mothers at mean age 2;4 and at mean age 2;10 dropped subjects in first position in the sentence
respectively in 55% and 30% of the NL utterances. Krämer (1995) found a range of 24 - 39% of subject drop in NL utterances of 7 monolingual Dutch children around age 2-3 years. More subjects were dropped with non-finite verbs than with finite verbs. We find that the hearing children in this study drop subjects with finite verbs in 25%, and with non-finite verbs in 35%. These percentages support the findings of Krämer.

In total 5 NL utterances with a transitive verb with an obligatory object are produced by the hearing children, but no objects were realized. We exclude here 9 sentences in the output of Alex (H) such as weet je 'you know' because these can also be considered to be discourse markers. The number of transitive verbs is so low, that we will not further analyze them.

Realization of arguments in SC output with a verb

In Table 9.13 we present the percentages of dropped subjects and objects in SC utterances with a verb in the output of the children (compare to input, Table 9.12).

<table>
<thead>
<tr>
<th>OUTPUT SC utt.</th>
<th>Total no. of utterances</th>
<th>DC S drop*</th>
<th>Total no. of utterances</th>
<th>HC S drop</th>
<th>Total no. of transitive verbs</th>
<th>DC O drop b</th>
<th>Total no. of transitive verbs</th>
<th>HC O drop</th>
</tr>
</thead>
<tbody>
<tr>
<td>signed V</td>
<td>5</td>
<td>n.a.</td>
<td>6</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>spoken V</td>
<td>1</td>
<td>n.a.</td>
<td>72</td>
<td>*10 (14%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>signed V +</td>
<td>1</td>
<td>n.a.</td>
<td>54</td>
<td>34 (63%)</td>
<td>*14 (26%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>spoken V</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Percentages are from total number of utterances with a verb

** Percentages are from total number of transitive verbs

= ungrammatical S- or Odrop

n.a. = not analyzed

The deaf children produce 7 SC utterances in total, with 5 signed verbs, one spoken verb, and one simultaneously signed and spoken verb. We shall not further analyze these.

The hearing children in total produce 131 SC utterances with a verb. Of these there are only 6 utterances with a signed verb; in all 6 no subjects are realized; 3 objects are lexically realized with 4 transitive verbs. These utterances are too few to make a valid comparison to the input.

There are 72 SC utterances with only a spoken verb. Of the subjects 47% is realized, mostly with a finite verb (91%). In 38 utterances the subject is omitted: one imperative and 27 subject topic drop - in these utterances the subject is not ungrammatically left out. In 10 utterances (10%) the subject should have been
realized. In general then these SC utterances seem to follow Dutch rules. In total 10 transitive verbs are used, and 7 of these are obligatorily realized, whereas two objects could be left out because of topic drop. Only one object should have been realized and was not. In all the children seem to combine Dutch spoken sentences with signs to support their communication with their mothers. Their output resembles the input in SC.

SC utterances with a signed and a spoken verb also occur (n=54) in the output of the hearing children. In the signed part 15 subjects are realized (28%) against 20 spoken subjects (37%). Even though most of the subjects are omitted in both parts, we see slightly more subjects realized in the spoken parts. Spoken subjects are omitted once in an imperative sentence, 18 times under topic drop conditions (33%), and 14 times incorrectly (26%). This means that slightly more subjects are dropped than in the other SC utterances and in the NL utterances, which might be interpreted as an influence of SLN in these SC utterances. But hearing children in hearing families also omit subject to this extent, so it is not abnormal. The subjects that are realized occur more often with finite verbs (12 times vs. 8 times, 60%). Also, more subjects are left out with non-finite verbs (n=24, 75%) than with finite verbs (n=8, 25%). So even in these SC utterances under the influence of SLN, we find rules for spoken Dutch applied to the spoken parts. In total 26 transitive verbs with obligatory objects are produced, and in 9 cases (35%) the object is realized. Topic drop occurs in 4 cases, and in 13 utterances the object is ungrammatically left out (50%). Also for this aspect we see a possible SLN influence on the realization of spoken arguments.

9.4 Position of verbs

In SLN utterances we should encounter verbs in final position (SOV) (Coerts 1994). SOV can change into O,SV via topicalization of the object (Coerts 1999). With a covert subject (or null subject) and (often) object deletion the order of ((O)VS) can occur, with a copied subject in sentence final position (Bos 1995). This last seems also to be grammatical in two-sign utterances. The status of the final Point as a subject pronoun copy, however, cannot be validated in these simple utterances and will not be further discussed here. Whether or not VOS order is grammatical in SLN, that is where the subject is non-overt and the object and a subject pronoun copy are lexically expressed, has not yet been studied (but see van Gijn (ms)). Native signers seem to disagree when asked for a grammatical judgment (Bos, pc). It is the question whether the signed parts of SC follow an SLN order.

Dutch is considered to be an underlying SOV language, but the order is SVO in main clauses. Topicalization is also frequently found, both in adult and in child language. Krämer (1995) describes topicalization as follows.
Topicalization of the object will derive an OVS order, and the very frequent topicalization of locations and adverbials of time will derive a Loc-VS order as in 59). Child language also has topicalization, as is shown in 60) and 61).

59) In Amsterdam steal men veel fietsen

   In Amsterdam steal they a lot of bikes

60) Die heb ik al (Hein 2;10)

   That have I already

61) Dat heeft tante Lieve ook (Gijs 2;7)

   That has aunt Lieve too

Topic drop can also occur, and then a surface order of VS may be derived. (Krämer 1995:45). (See for more details Krämer 1995, pages 40-46).

As discussed in section 8.2.1 in NL interrogative main clauses the verb is moved correctly to initial position (VSO) and in imperative sentences the verbs is also in first position, as in example (10):

(10) Pak de bal maar! (go get the ball)

   Get the ball interjection!

Here we want to know what the position of the verbs is in SLN, NL and SC utterances, both in the input and in the output (research question 24 in section 3.5).

Procedures

Signed and spoken (parts of) utterances with a verb were classified as follows:

1 Verb only (Vonly) - the verb occurs by itself, without other constituents. Verbs are used in a very simple way; the subject (and possibly the object or other constituents) have been omitted. But in the case of NL imperatives this is allowed, for instance: *ga 'go' and not 'go you'*. Since these utterances offer the children no clue to the verbal system (and linked aspects) of either SLN or NL, we excluded these utterances from further analysis.

2 The verb is in initial position (Vi). For SLN this is a grammatically correct position when the subject is covert and (often) the object omitted, e.g. *[DADDY] CLEAN-UP [TABLE] POINT to-daddy* ( [daddy] is cleaning up, [the table] +subject pronoun copy). For a discussion of subject pronoun copy in SLN see Bos 1995.

   For NL this is the usual position of the verb in interrogative sentences, e.g. *wil je een koekje? 'do you want a biscuit?'* or imperative sentences, e.g. *pak dat boek 'get the book'*. In declarative main clauses this position is usually ungrammatical, because an overt subject or another constituent is required in
first position. In the case of topic drop the verb can occur in first position without making the sentence ungrammatical.

3 The verb occurs in second position (V2). A verb was classified as V2 only in sign/word utterances consisting of at least three constituents. In Dutch the finite form of the verb has to be in second position, with the possibility of a non-finite verb (infinitive or past participle) in another position, usually final. Spoken finite main verbs, auxiliary verbs and copulas occur in second position, whereas this position does not regularly occur in SLN.

4 The verb occurs in final position. There are two subclasses:
- in final position in a 2 sign/word utterance (Vf2)
- in final position in ≥ 3 sign/word utterances (Vf3).
This is considered to be the grammatical position for SLN verbs. In SLN, if the subject or the object of the sentence (either nominal or pronominal) is repeated after the verb, the verb is still considered to be in final position. Yes, no, head nods and head shakes are disregarded in establishing verb position, as well as discourse markers.
In Dutch the finite verb cannot occur in final position (except in two-word utterances), but non-finite verbs usually are in final position in declarative

a) *ik ga die pop pakken* (I will fetch that doll)
   I go that doll fetch

b) *ik heb die toren gebouwd* (I have built that tower)
   I have that tower built
In certain elliptical utterances the verb can also occur in final position, as in even *lezen* '[I gonna] read'. The subject and auxiliary or modal are deleted.

5 Other positions

9.4.1 Verb positions in the input
Position of verbs in SLN and NL input
In Table 9.14 we present the number and percentages of different verb positions in the SLN and NL input of the deaf mothers to the deaf and hearing children. As mentioned before, the total NL input to the deaf children is minimal, and as only 3 utterances contain a verb we will not further discuss these.
Position of verbs 201

Table 9.14 INPUT DC+HC: Number and (%) of different verb positions in SLN and NL utterances of the deaf mothers

<table>
<thead>
<tr>
<th>SLN INPUT</th>
<th>to deaf children</th>
<th>to hearing children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vonly</td>
<td>n=122</td>
<td></td>
</tr>
<tr>
<td></td>
<td>70 (57)</td>
<td>21 (75)</td>
</tr>
<tr>
<td>Vinitial</td>
<td>22 (18)</td>
<td>3 (11)</td>
</tr>
<tr>
<td>V2</td>
<td>2 (2)</td>
<td>0</td>
</tr>
<tr>
<td>Vfinal2</td>
<td>22 (18)</td>
<td>4 (14)</td>
</tr>
<tr>
<td>Vfinal3</td>
<td>5 (4)</td>
<td>0</td>
</tr>
<tr>
<td>Vother</td>
<td>1 (-)</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NL INPUT</th>
<th>to deaf children</th>
<th>to hearing children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vonly</td>
<td>n=3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 (18)</td>
<td>25 (18)</td>
</tr>
<tr>
<td>Vinitial</td>
<td>1 (18)</td>
<td>81 (59)</td>
</tr>
<tr>
<td>V2</td>
<td>0</td>
<td>23 (17)</td>
</tr>
<tr>
<td>Vfinal2</td>
<td>0</td>
<td>8 (6)</td>
</tr>
<tr>
<td>Vfinal3</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Vfinal2 means a final verb in a 2 sign/word utterance
Vfinal3 means a final verb in a 23 sign/word utterance

The largest category of SLN input with a verb consists of Vonly, both with the deaf and the hearing children, but it is larger with the hearing children. These verbs occurring by themselves give the children no clue as to the grammatical structure of SLN. Even though the hearing children are offered signed verbs, the actual number and proportions do not offer the children many clues concerning the position of signed verbs.

In utterances consisting of 2 or more signs the following combinations occurred:

OV      BOEK LEZEN (I am going to read a book)
         BOOK READ
VO      only when the object is a wh-q sign, e.g.
        ZOEKEN VAT (what are you looking for?)
         LOOK-FOR WHAT
SV      VROUW ZITTEN (the woman is sitting)
         WOMAN SIT
VS      HUILEN POINTnaar-poppen (they are crying)
         CRY POINTto-dolls
VX or XV ZITTEN POINTstoel (he sits on the chair)
           SIT POINT chair

For incorrect or doubtful order we found the following examples:

VSO      KUSSEN POINTmark POINTpop (you [must] kiss the doll)
         KISS POINTmark POINTdoll
VOS      KUSSEN POINTpop POINTmark (you [must] kiss the doll)
202 Structural aspects in input and output

The majority of the verbs are in utterance-final or in initial position with subject drop; only a few verbs are in second position. In principle then it seems that grammatically acceptable sign order in SLN is presented to the children.

As outlined above, the spoken verbs in the NL input to the hearing children can be finite or non-finite, and this determines whether or not their position is grammatical. The function of the sentence also determines grammaticality. The category of verbs in first position is large, but of all finite spoken verbs (n=106) in NL utterances 95 (87%) are in correct position, either initial in imperative sentences or in topic drop contexts (e.g. past wel ‘fits’), or in second position in main clauses. Six finite verbs occur incorrectly in first position because the subject is ungrammatically left out (e.g. heb gepakt ‘have fetched’ (see section 9.3). One subject was left out which did not affect verb-order (wat zal [ik] tekenen, Jonas? ‘what shall [I] draw, Jonas?’).

Of the verbs in final position (in two-word-utterances) two are finite and correct, while there is one incorrect imperative: even zit (stem-form) instead of the non-finite form even zitten. There are 5 non-finite final verbs, 3 of which are correct imperatives (for instance even wachten). One non-finite verb occurs in an ungrammatical imperative (i.e. zoeken meer ‘search more’), which should have been either meer zoeken or zoek [er] meer.

In conclusion we see that the verb positions in the NL utterances offered to the hearing children are mostly correct and the verb has the correct form.

Position of verbs in SC input

Table 9.15 presents the number and positions of verbs in the first category Vsln+Vnl-, SC utterances with only a signed verb.

<table>
<thead>
<tr>
<th>SC INPUT:</th>
<th>to deaf children</th>
<th>to hearing children</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. and % of Verb positions in Vsln+Vnl- (signed verbs)</td>
<td>n=87</td>
<td>n=44</td>
</tr>
<tr>
<td>Verb only</td>
<td>17 (20)</td>
<td>23 (52)</td>
</tr>
<tr>
<td>Verb initial</td>
<td>14 (16)</td>
<td>6 (14)</td>
</tr>
<tr>
<td>Verb second</td>
<td>6 (7)</td>
<td>3 (7)</td>
</tr>
<tr>
<td>Verb final (Vf2+Vf3)</td>
<td>42 (48)</td>
<td>12 (27)</td>
</tr>
<tr>
<td>other</td>
<td>8 (9)</td>
<td>0</td>
</tr>
</tbody>
</table>
Position of verbs 203

The hearing children are proportionally offered far more signed verbs in isolation (Verb only) than the deaf children. This resembles the SLN input, where the hearing children also received many more signed Vonly than the deaf children. In that part of the SC utterances consisting of 2 or more signs the position of the verb is mainly initial or final with both groups of children. There are a few other positions (V2), and some exceptional structures in the input to the deaf children. In general the structures here resemble the SLN input.

In Table 9.16 we present the SC utterances with only a spoken verb (Vsln-Vnl+).

<table>
<thead>
<tr>
<th>SC INPUT: to deaf children</th>
<th>to hearing children</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. and % of Verb position in Vsln-Vnl+ (spoken verbs)</td>
<td>n=35</td>
</tr>
<tr>
<td>Verb only</td>
<td>0</td>
</tr>
<tr>
<td>Verb initial</td>
<td>15 (43)</td>
</tr>
<tr>
<td>Verb second</td>
<td>14 (40)</td>
</tr>
<tr>
<td>Verb final (Vf2+Vf3)</td>
<td>6 (17)</td>
</tr>
<tr>
<td>other</td>
<td>0</td>
</tr>
</tbody>
</table>

We see in Table 9.16 that only a few spoken Vonly are used with the hearing children. If a spoken verb is used, it is thus usually in utterances consisting of two or more other spoken words.

The verb positions differ in the input: most frequently V2 position with the hearing children, while with the deaf children verb initial and verb second positions are equally used. With the deaf children the spoken verbs in initial position are all finite but only two occur in an imperative sentence; thus, the majority of initial verbs are in ungrammatical positions (n=11, 73%). Of the verbs in V2 position 87% is finite and so grammatically correct, while the remainder has the wrong form (either infinitive form, stem-form or past participle). The verbs in final position are correct. Altogether 46% (n=16) of the spoken verbs in these SC utterances have the wrong position.

Looking at the input to the hearing children we see that V2 is the preferred position. Of these verbs in second position 95% are finite and correct, 5% is grammatically incorrect because they have the wrong form (infinitive or past participle). Of the verbs in initial position 37% occur in imperative sentences with correct finite or non-finite form, but 14% of these finite initial verbs should have occurred in second position. This is related to missing arguments (see section 9.3.1). Of the final verbs (n=9) 44% occurs in ungrammatical sentences, for instance in a sentence like: *wat is* 'what is' where the subject has been omitted. In total 15% of the verbs in SC utterances with only a spoken verb have ungrammatical positions.
We see that in the SC utterances with the hearing children mainly NL order is followed, while with the deaf children more grammatically incorrect spoken verb positions occur.

In most of the SC utterances with a verb there is a verb both in the signed part and in the spoken part (Vsln+Vnl+). Table 9.17 displays the data on these utterances.

Table 9.17 INPUT DC+HC : Number and (%) of signed and spoken verbs in SC utterances of the mothers

<table>
<thead>
<tr>
<th>SC INPUT: Signed verbs</th>
<th>to deaf children n=243</th>
<th>to hearing children n=416</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vonly</td>
<td>41* + 47* (36)</td>
<td>51* + 81* (32)</td>
</tr>
<tr>
<td>Vinitial</td>
<td>46 (19)</td>
<td>87 (21)</td>
</tr>
<tr>
<td>V2</td>
<td>30 (12)</td>
<td>57 (14)</td>
</tr>
<tr>
<td>Vfinal (Vf2 + Vf3)</td>
<td>75 (31)</td>
<td>138 (33)</td>
</tr>
<tr>
<td>Other</td>
<td>4 (2)</td>
<td>2 (-)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SC INPUT: Spoken verbs</th>
<th>DMDC</th>
<th>DMHC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vonly</td>
<td>41* + 72* (47)</td>
<td>51* + 42* (22)</td>
</tr>
<tr>
<td>Vinitial</td>
<td>63 (30)</td>
<td>96 (23)</td>
</tr>
<tr>
<td>V2</td>
<td>15 (6)</td>
<td>138 (33)</td>
</tr>
<tr>
<td>Vfinal (Vf2 + Vf3)</td>
<td>51 (21)</td>
<td>88 (21)</td>
</tr>
<tr>
<td>Other</td>
<td>1 (0)</td>
<td>1 (0)</td>
</tr>
</tbody>
</table>

*a this figure refers to those utterances that consist of a signed verb only and a spoken verb only, without other constituents present

b this figure refers to signed (or spoken) verbs only that occur in a SC utterances, where in the other part ≥ 2 constituents are present

From Table 9.17 it is clear that in general the deaf and hearing children receive more or less the same input as far as the signed parts of the SC utterances are concerned. The percentages verbs occurring in the different verb positions are strikingly similar: there are many signed signs which occur alone, most of the signed verbs are in final or initial position (with subject drop).

However, the spoken input is quite different. The deaf children are offered more SC utterances with a spoken part consisting of a verb-only than the hearing children. Also a much larger proportion of verbs in second position (V2) is offered to the hearing children than to the deaf children. Example (11) gives an impression of an ungrammatical spoken part. In this example the second verb geeft 'give' is in the finite form, while it should have been in the infinitive form geven after the modal verb moeten 'must'.

(11) [MS 3;0-utt. 48]

KAART GEVEN
kaartje moet geef
TICKET GIVE
ticket must give(finite)
We have already seen in section 9.3.1 (Table 9.12) that the deaf children receive ungrammatical spoken input in 45% of the SC utterances with a signed and spoken verb, compared to 19% with the hearing children. The findings here support the idea that the hearing children are offered mainly Dutch grammatical rules in SC utterances, whereas the deaf children are offered either SLN-like SC utterances, or grammatically incorrect Dutch utterances.

9.4.2 Positions of verbs in the output

Position of verbs in SLN and NL output

In Table 9.18 we present the number and percentages of different verb positions in SLN and NL utterances of the deaf and the hearing children. The data are pooled over time.

<table>
<thead>
<tr>
<th>SLN OUTPUT</th>
<th>Deaf children</th>
<th>Hearing children</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n = 90</td>
<td>n = 71</td>
</tr>
<tr>
<td>Vonly</td>
<td>34 (38)</td>
<td>21 (84)</td>
</tr>
<tr>
<td>Vinitial</td>
<td>8 (9)</td>
<td>2 (8)</td>
</tr>
<tr>
<td>V2</td>
<td>11 (12)</td>
<td>0</td>
</tr>
<tr>
<td>Vfinal2</td>
<td>29 (32)</td>
<td>2 (8)</td>
</tr>
<tr>
<td>Vfinal3</td>
<td>8 (9)</td>
<td></td>
</tr>
<tr>
<td>NL OUTPUT</td>
<td>Deaf children</td>
<td>Hearing children</td>
</tr>
<tr>
<td></td>
<td>n = 0</td>
<td>n = 71</td>
</tr>
<tr>
<td>Vonly</td>
<td>17 (24)</td>
<td></td>
</tr>
<tr>
<td>Vinitial</td>
<td>24 (34)</td>
<td></td>
</tr>
<tr>
<td>V2</td>
<td>10 (14)</td>
<td></td>
</tr>
<tr>
<td>Vfinal2</td>
<td>17 (24)</td>
<td></td>
</tr>
<tr>
<td>Vfinal3</td>
<td>2 (4)</td>
<td></td>
</tr>
<tr>
<td>exceptions</td>
<td>1 (2)</td>
<td></td>
</tr>
</tbody>
</table>

As we expected from the MLU data in section 9.1.2, the deaf children produce more verbs in SLN utterances consisting of ≥ 2 signs/constituents (41%) than the hearing children (8%). The hearing children produce mainly signed verbs occurring alone. In the input to the deaf children the mothers produced 22% of the verbs in utterances consisting of ≥ 2 signs/constituents (see Table 9.14), compared to 14% with the hearing children. The signed verbs in the output of the deaf children occur predominantly in final position, and sometimes in initial position (with subject drop). The deaf children also produce verbs in second position (see examples (12) and (13)), although these were hardly ever offered to them in the SLN input.

(12) [Laura 2:6-utt. 17]
POINTboek NAAIEN POINTlaura
POINTboek SEW POINTlaura
(object verb subject)
(I have sewn that)
The hearing children mainly produce signed verbs without other signs/constituents present. There are four occurrences of multi-utterances with a verb, in initial or final position, which are correct positions in these utterances.

In the NL output of the hearing children the verb is not predominantly in second position, despite their apparent focus on Dutch. Verbs occur most often in initial position (see (14) and (15), which reflects the input, or in final position, like in example (16) and (17). These are typical for Dutch monolingual children at this age (see Gillis and De Houwer 1998). The verb is acquired in final position (non-finite) first by monolingual Dutch children and later in second position (finite) are acquired. Auxiliaries and modals first appear in second position, lexical verbs later.

(14) [Jonas 2;0-utt.2]  
\[ kan niet \]  

The subject is dropped here. The utterance should have been *dat kan niet* 'that's not possible'.

(15) [Alex 2;0-utt. 1]  
\[ zal ik die? \]  

In example (15) the lexical verb is left out, but the auxiliary is in the right position in an interrogative sentence, which should read *zal ik die pakken?* 'shall I fetch that one?'

(16) [Alex 2;0-utt.11]  
\[ mama lezen \]  

non-finite form is used,  
\[ mommy read \]  

no auxiliary – "mama moet lezen"  
(mommy must read)

(17) [Alex 2;0-utt.63]  
\[ met oma praten \]  

[ik wil (I want)] is left out  
\[ with granny talk \]  

We found one typical example for word order in a subordinate clause (see (18)).
In this example the utterance should be *even kijken of de laatste man goed is 'let's see if the last man is alright'. The conjunction *of 'whether' is left out in this sentence, the verb is in last position. This is the correct position in a subordinate clause.

In sum we can say that in SLN the deaf children adhere to SLN verb positions, and so do the hearing children in the few SLN utterances they produce. In NL the hearing children have many verbs in initial position as a result of incorrect subject drop. But they produce many correct verbs in second position. The NL input they receive is also mostly correct. The hearing children are no different from monolingual Dutch children in their production.

### Position of verbs in SC output

The 7 SC verbs produced by the deaf children were either signed alone (n=5) or in final position. We will not further discuss the SC output of the deaf children, but of the hearing children only. As we saw earlier (section 9.2.2) the hearing children show a predominance of spoken verbs in their output. 95% of the SC utterances with a verb have spoken verb. This mirrors the input and emphasized the importance of the spoken modality.

In category Vsln+Vnl- (n=6) two of the verbs occur by themselves, two in initial position and two in final position. These numbers are actually too small to warrant further discussion. In the input to the hearing children this category was also quite small (see Table 9.15), where most of the signed verbs were offered in isolation. In the few SLN utterances and SC utterances there were altogether 31 signed verbs. The hearing children show only a little evidence that they are learning the rules of SLN order.

Category Vsln-Vnl+ in the output of the hearing children is presented in Table 9.19.

<table>
<thead>
<tr>
<th>Table 9.19 OUTPUT HC: Number and (%) of spoken verb position in SC utterances of the hearing children</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SC OUTPUT:</strong></td>
</tr>
<tr>
<td>No and % Verb position</td>
</tr>
<tr>
<td>Vsln-Vnl+ (spoken verbs)</td>
</tr>
<tr>
<td>Verb only</td>
</tr>
<tr>
<td>Verb initial</td>
</tr>
<tr>
<td>Verb second</td>
</tr>
<tr>
<td>Verb final (Vf2+Vf3)</td>
</tr>
</tbody>
</table>
When spoken verbs occur without accompanying signed verbs, the verbs are predominantly in initial position (90% correct in interrogatives or imperatives, or with topic subject drop) or in second position - NL verb positions. A small percentage of spoken verbs occurs in final position.

There are a few exceptional utterances, such as example (19):

(19) [Jonas 2;0 - utt. 17]

     neg
nee, zegge jij
     neg
no, say you

(don't say: what are you saying)

Jonas' mother could not see her son's face because he was looking down and she was often asking him what he was saying, to which he was objecting.

In Table 9.20 we present the number of utterances in the different categories in SC utterances with a verb in both parts (Vsln+Vnl+) in the output of the hearing children.

Signed verbs occur more often in isolation than spoken verbs. This confirms our findings that the hearing children focus more on the spoken forms. Initial signed verbs are rare, but spoken verbs occur in initial position more often – and four of these are ungrammatical. Compared to the verb position in NL utterances, the spoken verbs in these SC utterances occur more often in final position, and less often in second position. This suggests some influence of SLN on the spoken parts of these SC utterances.

In the input we found that the mothers tend to put the spoken verbs in second position or in final position, but sometimes with these verbs incorrect inflection was used (see section 9.4.1 example (11)). This is not found in the output of the children, they use second or final positions with the correct grammatical forms, i.e. finite forms in second and non-finite forms in final position.

To summarize the output of the children we can conclude that the deaf children mainly produce verbs in SLN utterances, these occur predominantly in final position or initially with subject drop. In general SLN rules are followed, which we also concluded for their SLN input.
Table 9.20 OUTPUT HC: Number and (%) of signed and spoken verbs occurring in SC utterances

<table>
<thead>
<tr>
<th>SC OUTPUT Signed verbs</th>
<th>Hearing children n=54</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vonly</td>
<td>28 (52)</td>
</tr>
<tr>
<td>Vinitial</td>
<td>2 (4)</td>
</tr>
<tr>
<td>V2</td>
<td>3 (6)</td>
</tr>
<tr>
<td>Vfinal Vf2</td>
<td>15 (28)</td>
</tr>
<tr>
<td>Vf3</td>
<td>5 (9)</td>
</tr>
<tr>
<td>Other</td>
<td>1 (2)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spoken verbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vonly</td>
</tr>
<tr>
<td>Vinitial</td>
</tr>
<tr>
<td>V2</td>
</tr>
<tr>
<td>Vfinal Vf2</td>
</tr>
<tr>
<td>Vf3</td>
</tr>
<tr>
<td>Other</td>
</tr>
</tbody>
</table>

The hearing children produce a few signed verbs, which occur by themselves and were thus coded as SLN. However, these on their own provide no evidence that the children are acquiring the verbal system in SLN. The signed verbs that are produced in SC utterances occur in final position, which indicates that the children are aware of the correct verb position in SLN being final. In the NL utterances produced by the hearing children the spoken verbs are either in initial (20% incorrect) or correct final and second position. This is similar to output by monolingual Dutch children. The NL input of the mothers also showed correct verb positions, although some ungrammaticalities occurred.

The spoken verbs in SC utterances produced by the hearing children occur often in second and initial position and some in final. These SC utterances then seem to follow Dutch rules for verb position, and are similar to the NL utterances. In the SC utterances where both a signed and a spoken verb occur, we can detect a small influence of SLN rules, in that spoken verbs occur more often in final position than in the NL utterances, or in SC utterances with only a spoken verb.

9.5 Verb Inflection

In this section we will look at the production of inflection in signed and spoken verbs, in particular we will consider if the inflection is appropriate for the signed and spoken verbs in SLN, NL and SC utterances (see question 25 in section 3.5). Based on the literature (see Chapter 2), we expect agreement and spatial morphology on the verbs as well as classifier use in the SLN input at all points in time, and in the output from age 2;0 onwards (Woll 1998). For Dutch we might expect the deaf mothers to offer fewer morphological markers than native speakers would use (Scherm 1990; Ebbinghaus and Hessmann 1990; 1996). We cannot predict what pattern the deaf children will show; their development in a spoken
language is always delayed (see section 2.3.1). Monolingual Dutch hearing children of hearing parents produce infinitive forms of verbs from the beginning of word production. Finite singular forms can be expected to be produced 100% correct between the ages of 2;0 and 2;6 (2nd and 3rd person singular); 1st person singular between 3;0 and 3;6 (Bol and Kuiken 1988:59). The period 2;0-3;0 is an important period for the acquisition of the inflectional verb system in both Dutch and SLN.

Method

We look at all signed and spoken verbs as they occur in all utterances (see section 9.2) in the three language modes.

For signed verbs we looked at whether or not the verbs were inflected in various categories (see Padden 1988; Bos 1993, 1994)

1) The verb is in citation form (no inflection)
   The citation form of a sign is understood to be the least complex form that represents the whole paradigm and from which the other forms can most directly be derived (Appel et al. 1992:78)

   • Citation form
     PAKKEN BOEK (take the book)
     TAKE BOOK

2) The verb is marked for location
   • Location
     POINT tij PAKKEN boek (you take that book)
     POINT you TAKE book

   The sign PAKKEN 'TAKE' is made on the book.

3) The verb is marked for subject or direct or indirect object
   • subject/object
     2KIJKEN1 (you look at me)
     2LOOK1
     Subject (2=you) and object (1=me) are marked on the verb

   • subject/indirect object
     BOEK 1GEVEN2 (I give you the book)
     BOOK 1GIVE2
     Subject (1=I) and indirect object (2=you) are marked on the verb

4) The verb has classifier incorporation
   • classifier-incorporation
     BAL 1GEVEN(C-CL)2 (I give you the ball)
     BALL 1GIVE(C-CL)2
     The C-classifier is incorporated into the verb, and represents the direct object. The handform is a realization of a phoneme in sign languages. The unmarked handform of the
verb GIVE is changed into a C-handform, which is the classifier that represents the ball (or direct object) in the example above.

5) The verb is inflected for manner or aspect

- manner
  
  * OPEN-ALS-BEER (he walked like a bear)
  
  WALK-LIKE-BEAR
  
  The movement of the verb is changed into an imitation of the walk of a bear. Body movement can also play a part here.

- aspect: durative
  
  KIJKENvoortdurend (to keep looking)
  
  LOOKcontinuously

- frequentative
  
  KIJKENsteeds-opnieuw (to look again and again)
  
  LOOKagain-again

6) Negative verbs

It is doubtful whether or not these negative verbs can be considered as morphologically marked. Negative verb incorporation, of which only a few forms exist, seems not to be not productive in SLN. These forms are probably lexically encoded as negatives (Bos pc).

For spoken verbs we distinguished the following five categories:

1) The verb is in the infinitive form (non-inflected)

We include here the CDS imperative form, which is quite common in mother-child interaction.

- CDS imperative
  
  * Mark bal pakken (Mark fetch ball)
  
  Mark ball fetch

2) The verb is in imperative form. This is usually the verb-stem, as is shown in the following examples

- imperative
  
  * pak (take)
  
  hou op from the verb 'ophouden' (stop)

3) The stem of a verb is used, e.g. zit 'sit'. From the context it is clear that these forms are not imperatives but stem-forms as described by Ebbinghaus and Hessmann (1996) (see also section 9.4). They do not give a definition, but paraphrase "unmarked forms […] are often identical to the stems" (1996:35).
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4) CDS forms. In Dutch typical Child Directed Speech (CDS) forms are found that in form resemble imperatives or stem-forms. These forms are used as a comment on an action.

- CDS form  
  * CDS form  
    aai aai (stroke) while stroking a cat,
    spring spring (jump) while jumping up and down.

5) The verb is in finite form (inflected)
Finite forms can occur with main verbs, auxiliaries and copulas
- 2nd/3rd person singular -t (or irregular forms)
- plural: correct form is used (plural form is often identical to infinitive
  -en)
- past tense -de(n) or -te(n), or irregular forms

5) Past participle of a verb (inflected, non-finite)

9.5.1 Verb inflection in the input
Based on what we have already found (Chapters 7, 8 and 9) on the SLN and NL input, we might expect that the signed verbs will be similarly inflected in the input to the deaf and hearing children, whereas the NL input will contain more finite forms with the hearing children. We can expect this to be also the case in the signed and spoken parts of the SC utterances.

Figures 9.VIa and 9.VIb shows the percentages of the various forms of all signed verbs in the SLN and SC input of the mothers. The data are pooled for the mothers with the deaf children and with the hearing children because little change could be observed over time. Where development is observed, this will be discussed.
The signed input to the deaf and hearing children appears to be very similar, in both language modes. Signed verbs in citation form are used in more than 72% of the SLN utterances and in 85% of the signed parts of SC utterances with the deaf and hearing children respectively. There is hardly any change over time in the use of citation forms in either language mode.
Verbs are marked for location and manner/aspect similarly in the SLN and the SC input to both groups of children. Slightly more classifier incorporation occurs in the SLN input to the hearing children (7%) than to the deaf children (3%). With the hearing children we also observe some subject/object marking on the signed verbs, which does not occur with the deaf children yet. More negative verbs are used with the deaf children than with the hearing children. There is no consistent development the use of inflections in the input of the mothers with most children, except with Laura (D) at age 3;0 where we observe an increase in the use of verbs inflected for manner.
In section 9.1.1 we found that the mother of Mark showed a decreasing SLN-MLU after age 2;0. Earlier we suggested that this may be caused by the use of fewer signs, but more morphology per utterance. However, this turns out not to be the case. In general we find only very few morphological markers on verbs in the signed input. Since we have found no literature on the structure of signed input we cannot
compare the input of the deaf mothers to input in other sign languages. The mothers offer the children mainly the citation form of verbs, which is perhaps a characteristic of Child Directed Signing. We think there may be a connection between the lack of morphology in the input and the language level of the children. We will come back to this issue in the next section.

In section 9.3.1 we found more subject drop in the SLN of the deaf mothers (57%) than Bos' had found for adult signers (39%). One explanation would have been that the deaf mothers use more inflected verbs than the adults. However, the signed verbs in the input are so seldom inflected that this cannot explain the difference. The fact that the mothers drop more subjects can only possibly be explained by the here-and-now character of the interaction.

The various forms of spoken verbs in NL and SC input to the deaf and hearing children are shown in 9.VIIa and 9.VIIb respectively. In the input of the deaf children the three verbs in NL utterances are not presented here (see section 9.2.1), only the spoken verbs in the SC input are shown.

![Figure 9.VIIa INPUT DC: Spoken verb forms in SC input of the deaf mothers to the deaf children (NL too few to be analyzed)](image-url)
Verbs in the non-inflected form hardly occur in the NL input to the hearing children. Most of these occur by themselves or in imperatives like even *kijken* 'let's look'. They occur more often in the SC input. A clear difference between the NL and spoken SC input is the occurrence of many imperative forms in NL with the hearing children (see section 8.2.1), whereas these forms occur less often in the SC input to the deaf and hearing children. This can be attributed mainly to the mother of Alex (H), who uses more imperative forms with her son until the age of 2;6 than the other mothers (see also Chapter 8).

Stem forms and non-inflected forms are used slightly more often with the deaf children in SC than with the hearing children. This might suggest more sign-like structures (see sections 2.2 and 9.6) according to Ebbinghaus and Hessmann (1996). They described these forms in the German Sign Language (GSL) production between deaf partners in conversation. Ebbinghaus and Hessmann remark that 57% of the verbs in their sample consisted of infinitives and stem-reduced forms - in our data we found 56% with the deaf children and 34% with the hearing children. The input to the deaf children resembles the findings for GSL. The fact that with the hearing children these forms occur less often again is an indication that more NL-like structures are used with them compared with the deaf children.

CDS forms like *aai* 'stroke' are only used with the hearing children, but occur rarely.

Finite forms are offered in SC to both the deaf and the hearing children, but to a much larger degree to the hearing children. They are also offered finite forms in NL utterances, but much less so. The percentages for finite forms include auxiliaries and copulas. Over time the mothers show an increase in the use of finite forms with Jonas, Alex and Sander, although at 3;0 there is a decrease with Sander.
Auxiliaries and copulas are not used to the same extent with the deaf and with the hearing children. Figure 9.VIII shows the percentages of auxiliaries and copulas of all SC spoken verbs offered to the deaf and hearing children, and of the NL verbs with the hearing children. More auxiliaries and copulas are used with the hearing children in SC, which supports the idea that more Dutch-like SC is used with them, and more SLN-like SC with the deaf children.

Past participles occur to the same extent in the input to the deaf and to the hearing children. Wijnands (forthcoming) found the following percentages for finite verbs and past participles in the Dutch input of two hearing mothers to two hearing children between the ages of 1;9 and 2;5 (8 recordings of approx. 45 minutes). These verb forms also included copulas and auxiliaries. We include Wijnands' data in Table 9.21 together with data of our deaf mothers with the deaf children and with the hearing children.

<table>
<thead>
<tr>
<th>Mothers of:</th>
<th>finite verb % in NL</th>
<th>finite verb % in SC</th>
<th>past.part. % in NL</th>
<th>past.part. % in SC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bram</td>
<td>51</td>
<td>-</td>
<td>5</td>
<td>-</td>
</tr>
<tr>
<td>Sarah</td>
<td>62</td>
<td>-</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>DC</td>
<td>0</td>
<td>28</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>HC</td>
<td>24</td>
<td>53</td>
<td>0</td>
<td>6</td>
</tr>
</tbody>
</table>
The percentages of finite verbs in the spoken SC input of the deaf mothers to the deaf children are clearly lower than those found for hearing mothers with their hearing children. With the hearing children in our study the percentages are similar. The percentages for past participles are small at this age and similar for all mothers and occur in our data only in SC utterances.

In sum we found that the deaf mothers use a high percentage of uninflected signed verb forms at all ages with both groups of children. Signed verbs are occasionally inflected spatially and for manner, and also some subject/object marking and classifier use can be observed. With the deaf children spoken finite verbs are used only to a small extent, which supports the findings in section 9.2.1 that the SC input to the deaf children is more SLN-like than Dutch. We can see no development over time either in signed or spoken verbs with regard to more complex morphology being used with the deaf children.

With the hearing children much more inflection on spoken verbs is offered than with the deaf children, indicating a more obvious use of Dutch syntactic rules. The use of finite forms increases as the children grow older.

In general then we see the beginning of SLN verb inflection in the input to both groups of children, and convincing evidence of NL verb morphology and syntax only in the input to the hearing children and on a level comparable to input in hearing families.

9.5.2 Verb inflection in the output

The percentages of the various forms for all signed verbs in the SLN and SC output of the deaf and hearing children are presented in Figures 9.IXa and 9.IXb respectively.
The deaf children produce mainly signed verbs which are in citation form (89%). They start producing all the different verb-inflections from age 2;0 onwards, which is according to expectation (Woll 1998). These inflections occur only in SLN, but it must be remembered that they produce very few SC utterances (see section 5.3.2). First location is marked on the verb (2;0) then at 3;0 subject/object marking and manner appear, as well as some classifier incorporation. They produce a few negative verbs at age 3;0. Mark at age 3;0 produces one auxiliary *OP1 'ACT-ON'* as described by Bos (1995). All the different verb forms are present in the SLN and SC input (compare Figure 9.Vla).

The hearing children produce 92% of uninflected signed verbs in SLN, and 87% in SC. In SLN and SC they produce some verbs marked for location (at age 2;0), and in SC we see also some subject/object marking (from age 2;6). Sander produces one auxiliary (citation form) at age 2;6: *HALEN KOPEN 'FETCH BU'* , meaning "I will go and buy it". the can be expected at this age. The input also included classifier incorporation and manner marking which the hearing children do not seem to produce. Assuming no sampling error, the hearing children seem therefore to lag behind a little compared to the deaf children in their acquisition of the (signed) verb inflection system.

In the next Figure 9.X we show the different spoken verb categories produced by the hearing children, pooled over time. The deaf children produce no spoken verbs.
The hearing children produce many non-inflected forms, more than appeared in the NL and SC input. Many infinitives occur alone or in imperative sentences (e.g. *even kijken* 'let's look'), but the majority is correctly used with an auxiliary in the finite form. They seem to make fewer mistakes than the mothers, although some incorrect forms are imitations of the forms used by the mothers.

Imperative forms occur rarely in the output of the three hearing boys. Stem-reduced forms are only produced by Jonas. There is one cds-form produced (Alex). Past participles are produced from the age of 2;6 on by Jonas and Sander (5%), comparable to Wijnands' data (forthcoming). Finite forms occur slightly more proportionally than in the NL input, but the children produce a higher percentage of finite forms in SC than their mothers (compare Figure 9.VIIb). Two children in the Wijnands' study, Bram and Sarah produced 47% and 57% of finite verbs respectively, at ages between 1;9 and 2;5. We see a steady increase in the use of finite forms as they grow older, although this is not so clear with Jonas. On the whole then, the spoken verb production of the hearing children in interaction with their mother is comparable to that of monolingual hearing children.

Figure 9.XI shows the distribution of main verbs, auxiliary verbs and copulas over all spoken verbs in the NL and spoken SC output of the hearing children.
The children produce more auxiliaries and copulas in the SC utterances than their mothers. This indicates more influence of NL rules in the SC production of the hearing children than in their mothers' input of SC.

Summarizing we can say that the deaf and hearing children mainly use uninflected signed verbs, but that the beginning of spatial and subject/object inflection can be observed in the output of all children. The deaf children show also the other forms of inflection. The input to the deaf and hearing children was comparable, but the deaf children seem to be further in their development. Compared to children acquiring BSL or ASL the inflection is age-appropriate.

The hearing children use age-appropriate inflection for the spoken verbs, comparable to the language production of monolingual Dutch hearing children. They produce a higher proportion of auxiliaries and copulas in SC than their mothers. They show more influence of Dutch syntactic rules in their SC production. The percentages of finite forms are comparable to the NL input but higher again in the SC output and seems to develop in the same way as with monolingual Dutch hearing children. We can conclude that the SC output of the hearing children strongly resembles their Dutch output, but that more verb forms are presented in SC. This confirms the findings reported in section 9.1.2, that the most complex language is produced in the spoken parts of the SC utterances of the hearing children.
9.6 Use of sentence and morphological marking

In the previous section we considered morphological marking on the verb. In this section we will consider morphological markers in the noun phrase and sentence markers. Firstly we will consider the non-manual grammatical interrogative markers \( q \), \( wh-q \) and the negation marker \( neg \) used in SLN and signed SC utterances, in input and output (research question 26 in section 3.5).

In Dutch the morphological marking in the noun phrase is quite complex and it is known that generally deaf adults have problems with morphology in spoken languages. During the filming sessions and in interaction with the mothers we observed that the mothers used hardly any diminutive markers in Dutch, whereas hearing mothers use many diminutives with their children during the early years (Schaerlaeken and Gillis 1987). It has also been observed that deaf adults have problems with the production of inflection on adjectives. Here we will consider plural and diminutive markers, and markers on adjectives used (correctly) in NL and SC utterances, both in the input and the output (question 27).

**Method**

**Sentence markers in SLN and SC**

In SLN the following non-manual sentence markers have been described by Coerts (1992):

- **yes-no-question** \( (q) \): eyebrows up, head forward (o.c.: 109)
- **wh-question** \( (wh-q) \): eyebrows down, chin up (o.c.: 112)
- **negation** \( (neg) \): side-to-side headshake (o.c.: 116)
- **topicalization** \( (t) \): eyebrows up (o.c.: 117)

We will describe the use of the non-manual markers \( q \), \( wh-q \) and \( neg \). Because of the age of the children the non-manual marker \( t \) for topicalization was not to be expected in either input or output, and indeed was not observed in our data. We will therefore not discuss it further.

From a study by Schnitzer-Reilly and Bellugi (1996) we know that mothers start using non-manual markers in ASL in a grammatical way with their children from the age of 2;0 on. Schnitzer-Reilly and Bellugi describe the conflicting roles that the face plays in early interaction between mothers and children: "not only do facial signal affective and communicative information, but specific facial behaviors also function as obligatory grammatical markers." (1996:219).

We also know from descriptions of contact signing (Lucas and Valli 1992) that non-manual markers are often left out during simultaneous signing and speaking. Under the influence of voice with speech, the non-manual markers (especially facial expressions and oral components) are suppressed, because these are not used in spoken language. For these reasons we wish to look at the occurrence of grammatical non-manual markers in the input of the deaf mothers in SLN and SC.
During the transcription process we noted whether or not the appropriate non-manual features were produced during the relevant structures by the mothers. No narrow transcription was made, however. In general we coded whether or not the characteristics, as described below, were present. We looked at all interrogative and all negated sentences (see also Chapter 8) in the following way:

**Interrogative**
- a) yes/no-question
  - is q-marker present?
- b) wh-question
  - is wh-q marker present?

**Negation**
- a) lexical negation
  - is a lexical negation sign present?  
    e.g. *NIET* 'NOT', *NOOIT* 'NEVER'
- b) non-manual negation
  - is the negative non-manual marker present (head shake)?

**Morphological markers in Dutch and SC**
From studies done on contact signing (Schermer 1990; Lucas and Valli 1992; Ebbinghaus and Hessmann 1996) we know that many morphological markers in the spoken modality are omitted by deaf adults. We expect this to be true also for the spoken input to the deaf children. However, it is not clear what occurs in the input to the hearing children and therefore no prediction can be made. For the output of the deaf children we expect no morphological markings, and for the hearing children age-appropriate markings.

We coded all nouns, adjectives and adverbs in analyzable NL and spoken SC utterances in the following way:

**Nouns:**

<table>
<thead>
<tr>
<th>Form</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>uninflcted noun</td>
</tr>
<tr>
<td>N-en</td>
<td>plural -en</td>
</tr>
<tr>
<td>N-s</td>
<td>plural -s</td>
</tr>
<tr>
<td>N-dim</td>
<td>diminutive marker</td>
</tr>
<tr>
<td>N-dim-s</td>
<td>special form: stem-reduced</td>
</tr>
</tbody>
</table>

Deaf adults can produce an ungrammatical singular form of a noun (in Dutch), where the endings '-en' or '-je' of a lexeme are mistakenly interpreted as a plural marker -en or a diminutive marker -je. It could also be the case that such endings as -en and -je are more difficult to pick up in speech-reading. See example (20)

\[(20) \textit{kui}k \text{ in stead of kuik}nen \quad \text{(chicken)} \]
\[\textit{meis} \text{ in stead of meis}je \quad \text{(girl)} \]

**Adjectives:**
Adjectives have inflection according to the gender of the noun and type of article. This results in correct inflected forms (21) and inflected forms (22). We have observed that deaf adults often produce incorrectly inflected forms as in (21a) or incorrectly uninflcted forms as in (22a).
A

uninflected adjective

(21)  *dat is een mooi pak
that is a *nice suit

(21a)  *dat is een mooi-e pak
that is a *nice suit

A-e

inflected adjective

(22)  *dat is een mooi-e boom
that is a *nice tree

(22a)  *dat is mooi boom
that is *nice tree

If the morphological markers we have described are infrequent in the input, they will be acquired by the children later and with more difficulty. Moreover, if the deaf mothers omit these markers and thus produce 'ungrammatical' Dutch, the children receive wrong evidence for the application of these markers. We will look at the frequency of these markers in the NL and spoken SC input of the mothers, and whether or not they are grammatically used.

9.6.1 Morphological markers in the input
Sentence markers in SLN and signed SC input

We will first present the occurrence of the interrogative non-manual markers q and wh-q in SLN and SC utterances. Table 9.22 shows the data for the realization of these markers pooled over time.

<table>
<thead>
<tr>
<th></th>
<th>Deaf mothers</th>
<th>SLN</th>
<th>SC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Deaf children</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mother of Carla</td>
<td>7 (50)</td>
<td>19 (59)</td>
<td></td>
</tr>
<tr>
<td>Mother of Laura</td>
<td>14 (56)</td>
<td>48 (74)</td>
<td></td>
</tr>
<tr>
<td>Mother of Mark</td>
<td>24 (73)</td>
<td>44 (92)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hearing children</td>
<td>50 (51)</td>
<td></td>
</tr>
<tr>
<td>Mother of Jonas</td>
<td>4 (57)</td>
<td>50 (51)</td>
<td></td>
</tr>
<tr>
<td>Mother of Alex</td>
<td>1 (100)</td>
<td>32 (46)</td>
<td></td>
</tr>
<tr>
<td>Mother of Sander</td>
<td>2 (50)</td>
<td>66 (51)</td>
<td></td>
</tr>
</tbody>
</table>

The numbers of interrogatives in SLN are so much smaller than in SC it is difficult to make strict comparisons using percentages.

For the mothers of Carla (D) and of the hearing children the percentages of non-manual markers are more or less similar in SLN and in SC. The mother of Laura
(D) and Mark (D) seems to have a higher percentage in SC, and with Mark also in SLN. In the input to the deaf children there is a general increase in sentence markers. Altogether with Laura and Mark the proportion is always quite high. With Jonas (H) the occurrence of markers is inconsistent, at age 2;0 his mother offers him non-manual markers with 39% of the interrogative utterances, at age 2;6 with 66% but this percentage drops to 54% at age 3;0. With Alex (H) there is a high percentage at age 2;0 (73%) but afterwards it drops to 30%. Only with Sander (H) we see a consistent increase in the use of interrogative sentence markers, up to 78% at age 3;0.

Schnitzer-Reilly and Bellugi (1996) found that before the age of two of their child, deaf mothers produce markers with approximately 20% of interrogative utterance, and after the age of two 80%. They explain these findings as follows.

It appears that mothers consider affect to be the primary communicative system for the face up until the end of the child's second year. Then, at two, a dramatic shift occurs in the role of facial expression to include not only affect, but linguistic information as well. (Schnitzer-Reilly and Bellugi 1996:229)

So before age 2;0 of the child the mothers stick to a uni-functional facial expression (affect and communication). Schnitzer-Reilly et al. furthermore state that the use of wh-q markers by the mothers occurs sometime after their child demonstrates productive competence with manual wh-signs. We will discuss this further in section 9.6.2.

In our data we do not find clear evidence for a shift in the input at age 2;0. With Carla there is a shift at age 3;0 but with Laura after age 1;6. With Mark we find a consistent use of the markers at all ages. With the hearing children we see an increase at age 3;0 with Sander, but no consistent use with Alex and Jonas. It is clear that the use of markers is less with Carla and the hearing children. With Carla (D) and the hearing children we found that the spoken parts of the SC input were with voice (see section 6.1.1). With Laura and Mark this was not the case, or much less. The use of voice might interfere with the use of the face for grammatical markers. However, at age 3;0 Carla's (D) and Sander's (H) mother do not use their voice less often but they do show an increase in the use of markers. We have no explanation for this fact at this point.

The non-manual negation marker is mostly used with the hearing children simultaneously with a negation sign or word. With the deaf children the mothers also use the neg marker as sole negator. The few instances when no neg marker was used were all utterances where the verb KUNNEN-NIET 'CAN-NOT' was used; this verb is negative in itself, but simultaneous use of the neg marker is obligatory (see also section 9.3.1). We have no explanations for these exceptions, except for the fact that in three out of four occurrences the child was shaking its head and simultaneously signing while looking at the mother. The fourth example of the sign KUNNEN-NIET 'CAN-NOT' was dislocated into the visual field of the child by the
mother, as the child was looking at a picture in a book so the child could not see the nonmanual negation.

Morphological markers in NL and spoken SC input

We found very few instances and percentages of morphological markers in NL and spoken SC. We therefore decided to pool the data of the two language modes. We present the results for the morphological markers in NL and SC utterances of the mothers in Table 9.23.

<table>
<thead>
<tr>
<th>INPUT</th>
<th>to deaf Children</th>
<th>to hearing Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>500 (96)</td>
<td>861 (93)</td>
</tr>
<tr>
<td>N-en</td>
<td>13 (3)</td>
<td>57 (6)</td>
</tr>
<tr>
<td>N-s</td>
<td>2 (-)</td>
<td>3 (-)</td>
</tr>
<tr>
<td>N-dim</td>
<td>3 (-)</td>
<td>4 (-)</td>
</tr>
<tr>
<td>N-dim-s</td>
<td>0</td>
<td>2 (-)</td>
</tr>
<tr>
<td>N-stem</td>
<td>0</td>
<td>4 (-)</td>
</tr>
<tr>
<td>Total N</td>
<td>522</td>
<td>931</td>
</tr>
</tbody>
</table>

Both with the deaf and with the hearing children most nouns in NL and spoken SC utterances are in the singular and correct form. That means that the mothers do not often talk about a number of referents from the environment. The reason for this is unclear, but since it is found in all four mothers it is unlikely that it is a sampling error. Plural noun forms do not occur very often, but are used correctly in 76% of the cases with the deaf children, and in 88% with the hearing children. With the deaf children there are 4 singular forms incorrectly used where plural forms should have been used and with the hearing children 8 incorrect forms. These are given below.

**Input to deaf children:**

Mother of Laura:  
- veel pop  (many doll) indicating various dolls  
- veel auto  (many car) indicating various cars  
- schoen uit (shoe off) meaning both shoes  

Mother of Carla:  
- vier hoed (four hat)
Input to hearing children:

Mother of Sander:  
veel konijn  (many rabbit)
zes kuiken  (six chicken)
veel gekookt ei (many boiled egg)
nog meer pop (more doll)  indicating more dolls

Only 3 to 6% of the nouns in the spoken input of the deaf mothers are inflected, mainly for plurality. There are hardly any diminutives. These figures confirm the findings of Ebbinghaus and Hessmann (1996:35) that no more than 4% of all nominal forms were inflected in their data. They state that "the unmarked forms of nouns and adjectives are often identical to the stems". They defined 56 (3%) out of their 2035 nouns as stem-reduced, where we found 4 out of 1508 (0.3 %). It is not known to what extent these stem-forms occur as the non-manual component in SLN as used between deaf adults (but see Schermer 1990), so we cannot compare the input in our study. Two mothers in our study used such stem-forms with the hearing children. These are presented below.

<table>
<thead>
<tr>
<th>Mother of Jonas (2;0)</th>
<th>kleer instead of kleren 'clothes'</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother of Sander (1;6)</td>
<td>toor instead of toren 'tower'</td>
</tr>
<tr>
<td></td>
<td>kuik instead of kuiken 'chicken'</td>
</tr>
<tr>
<td></td>
<td>meis instead of meisje 'girl'</td>
</tr>
</tbody>
</table>

Table 9.23 shows that only 2% and 3% of the adjectives are morphologically marked. Ebbinghaus and Hessmann found 3% of inflected adjectives in their GSL data, which is comparable to the findings here. With the deaf children the mothers produce 9 uninflected forms that should have been inflected, e.g. ander vrouw 'another woman' instead of ander-e vrouw or mooi ketting instead of mooi-e ketting 'nice necklace'. With the hearing children adjectives like these occurred 18 times. This means that the morphology for adjectives was presented not only infrequently, but also incorrectly in 50% of the cases with the deaf children, and in 39% with the hearing children.

We can draw the conclusion that the deaf mothers hardly use morphology for spoken nouns and adjectives. These findings confirm earlier studies on these aspects in other languages (Lucas 1990; Lucas and Valli 1992). Apparently the deaf mothers do not adapt their spoken Dutch for these aspects to the hearing status of their child: the use of morphological markers on nouns and adjectives/adverbs is strongly reduced in the input to both groups of children. The lack of such markers can thus be considered to be a characteristic of their language production, which is also sometimes incorrect in this respect according to Dutch rules.

Summarizing our findings on the use of sentence markers in the input we see that non-manual markers q, wh-q and neg are used in a grammatical way from the age of 2;0 onwards with the deaf children Laura and Mark. With Carla (D) and the
hearing children no increase in the use of these markers can be observed. This may be attributed to the overall characteristics of the input to these children: the mothers use voice with them while signing, and this factor may prevent the use of non-manual grammatical markers more in SC utterances than when no voice is used. For Dutch we found that spoken nouns only incidentally carry plural or diminutive markers. With spoken adjectives mainly the stem form is used. Inflected forms are thus not offered often to the children, and in the input to the deaf children half of the adjectives is incorrectly used, with the hearing children less. The little evidence of these forms in their spoken input may influence the production of these forms in the children.

9.6.2 Morphological markers in the output
Sentence markers in SLN and signed SC output

Table 9.24 shows the results for the realization of non-manual markers q and wh-q in the SLN and SC interrogative utterances of the children.

<table>
<thead>
<tr>
<th>Children</th>
<th>SLN</th>
<th>SC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deaf</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carla</td>
<td>5 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Laura</td>
<td>2 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Mark</td>
<td>12 (0)</td>
<td>1 (0)</td>
</tr>
<tr>
<td>Hearing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jonas</td>
<td>0 (0)</td>
<td>1 (33)</td>
</tr>
<tr>
<td>Alex</td>
<td>1 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Sander</td>
<td>2 (0)</td>
<td>2 (40)</td>
</tr>
</tbody>
</table>

The deaf children and Alex (H) produce no interrogative markers, even though they produce interrogative sentences with wh-question signs or words (see also Chapter 8 and below). Sander produces two yes/no markers at age 2;0 and Jonas one wh-q marker also at age 2;0. Schnitzer Reilly and Bellugi (1996) found that deaf mothers' use of grammatically correct wh-q markers occur some time after their child demonstrates productive competence with interrogative manual signs. We found the following number of manual wh-q signs (like WHAT, WHERE etc.) in the SLN and signed SC production of the children (see Table 9.25).
Carla's (D) and Sander's (H) mothers begin using the markers when their children are 3;0, which seems consistent with the children's use of signs like *WHERE* and *WHAT*. Jonas (H) and Alex (H) hardly produce manual question signs, and their mothers show no increase in the use of non-manual markers. Laura (D) and Mark (D) start producing wh-q signs from age 2;0 and in their mother's input interrogative sentence markers were always present, so we find no explanation here for the non-production of the non-manual markers. We see that the findings of Schnitzer and Bellugi (1996) are only supported by the results of Carla (D) and Sander (H). However, more data of the children at smaller time intervals between the ages of 2;0 and 2;6 and between 2;6 and 3;0 need to be studied in order to confirm their findings.

Negative markers are used by the deaf children and somewhat less by the hearing children (see Table 9.26). However, the way the negative marker is used differs greatly between the deaf and the hearing children. The deaf children mainly negate utterances by using the non-manual negation marker, but they also produce manual negation signs with a simultaneous marker. This reflects their input. Carla and Mark produces negative signs like *NIET* 'NOT' from age 2;0 on, Laura from age 1;6. Mark produces one negative verb with the appropriate headshake at age 2;6. There were no negation signs produced without a negation marker.

The hearing children, however, almost always produce a negation word while shaking their head, more like hearing speakers when shaking their heads together with a negative spoken sentence. Words like *nee* 'no' and *niet* 'not' or *geen* 'no'
appear in the SC language production of Jonas at 2;0, and with Alex and Sander at 2;6. Only Jonas at age 3;0 produces one negative sign NIEF 'NOT' together with the negation marker. No other negation signs are produced by the hearing children. They do produce some spoken negation words in NL utterances, Jonas from age 2;0, Alex from age 2;6 and Sander from age 3;0. These were all produced without an accompanying head shake. Since no negation markers as sole negators (so without a negation sign) were observed in their signed input, the children's output resembles the input in this respect.

In sum we can say that the children begin to produce wh-q signs from age 1;6 (Mark (D) and Jonas (H)) from age 2;0 onwards, but these appear without the appropriate non-manual sentence marker. In the input we saw individual variation with regard to the presence of these markers, and only with Laura (D) and Mark (D) were they consistently present with the interrogatives. In research with ASL these markers appear around age 2;6 in the language production of children. It is not clear that the lack of consistency in the input is the reason why the children do not produce these markers yet. Further studies at a later age of the children should reveal more information.

Negation markers are produced by the deaf children from age 1;6 or 2;0 on, and in a way similar to their input. The hearing children, however, do not use negation markers — they do produce head shakes, but these are always linked to spoken negation words. Their mothers always linked the negation marker to either a negation sign or a negation word, they were not offered as sole negators. In this respect the hearing children do reflect the input of their mothers, and they show once again that they seem to be focused on the rules for spoken language, even in their SC utterances.

Morphological markers in NL and spoken SC output
The results for the morphological markers in NL and spoken SC produced by the deaf and hearing children are presented in Table 9.27.

<table>
<thead>
<tr>
<th></th>
<th>Deaf children</th>
<th>Hearing children</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>52 (98)</td>
<td>325 (90)</td>
</tr>
<tr>
<td>N-en</td>
<td>1 (2)</td>
<td>14 (4)</td>
</tr>
<tr>
<td>N-s</td>
<td>0</td>
<td>5 (1)</td>
</tr>
<tr>
<td>N-dim</td>
<td>0</td>
<td>12 (3)</td>
</tr>
<tr>
<td>N-dim-s</td>
<td>0</td>
<td>4 (1)</td>
</tr>
<tr>
<td>N-stem</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total N</td>
<td>53</td>
<td>360</td>
</tr>
</tbody>
</table>
It is clear that the deaf children use no morphology in their spoken output, but produce uninflected nouns and a few adjectives only. Since these forms hardly occurred in the input either, these findings are not surprising, but access is also of course a condition for acquisition.

The hearing children do produce different morphological markers; these occur from the age of 2;6 onwards. They produce plural markers on nouns from the age of 2;0 on, and diminutive markers only at age 1;6 (Alex) and 2;0 (Jonas and Sander). Diminutive markers were not present in their input. These must have been encountered in interaction with persons other than their mother. The use of the e-inflection on adjectives is especially interesting. They occur at age 2;0 (Sander) and later (all hearing children). These findings are comparable to those found for monolingual hearing children (Bol and Kuiken 1988). We see that the language output of the children is actually a little more complex than that of the mothers. Also, we find no stem-forms in the output of the children such as found in the input of the mothers, which is considered a characteristic of deaf persons' speech.

In sum we find that the deaf children produce no morphological markers at all in NL and in the spoken parts of SC utterances. The hearing children are starting to produce spoken plural markers, diminutive markers and inflection on nominals and adjectives from the age of 2;0 onward, which is the normal age for these markers. The children produce morphological markers that were not present in the input (diminutives), but of course they may have encountered these in the interaction with hearing persons speaking Dutch with them.

9.7 Use of different sign and word types

Lucas and Valli (1992) and Ebbinghaus and Hessmann (1990;1996) described how the spoken language of deaf people is reduced in morphology and syntax (see also Mogford and Bishop 1988). We have shown that this reduction can also be observed in the language used by deaf mothers with their deaf and hearing children. We do not know whether or not deaf adults in the Netherlands also produce such reduced spoken Dutch, but we may assume that the same phenomena occur as have been established in Germany and the USA. Especially in language contact situations

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26 All hearing children have other hearing members in their family. Jonas' father is hearing. Alex and Sander both have hearing older siblings (see section 4.1).
where contact signing is used (Lucas and Valli 1992), or as we call it, Simultaneous Communication, we can expect that word types that are usual in spoken language are not usual or are used differently. In previous sections we have examined verb morphology, noun phrase and sentence markers. In this section we want to describe the use of other sign and word classes such as different types of function words, both in the input and the output (see research question 28 in section 3.5).

**Different sign types in SLN signed SC**

**Method**
The following classes of signs in all analyzable SLN and signed SC utterances are examined and defined as follows:

- **Deictic signs:**
  - personal pronouns: a point directed towards or made on a person
  - possessive pronouns: no distinction on formal grounds from personal pronouns, only on contextual grounds
  - demonstrative pronouns: a point directed towards an object or indicating direction or place

- **Finger-spelled signs:** all use of finger-spelled signs as described in the Dutch finger alphabet (Janssen 1986)

- **Numerals:** ONE, TWO, etc. or FIRST, SECOND etc.

- **Conjunctions:** the occurrence of conjunctions in SLN has not been studied so far, but under the influence of Dutch signs for NL omdat 'because', en 'and', want 'for' etc. are sometimes used

- **Discourse markers:**
  - LET-OP: a raised 1-hand to draw attention
  - OH: an open hand before an open mouth, with eyes opened wide and eyebrows up (surprise)
  - POINTto-person: in form undistinguishable from a pronoun, but contextually clearly identifiable as a discourse marker; the meaning is something like 'right-you-are'.

**Different word types in NL and spoken SC utterances**

We looked at the use of function words and numerals in the NL and spoken SC utterances in the input to the deaf and to the hearing children.

**Method**

We considered the following function words:

- personal pronouns: ik, jij, zij/hij, wij, jullie, zij (I, you, she/he, you, they)
- possessive pronouns: mijn, jouw, haar, zijn, ons, jullie, hun (mine, your, her, his, our, you, their)
- demonstrative pronouns: deze, dit, dat, die (this/these, that/those)
- articles: de, het, een (the, a)
Structural aspects in input and output

- prepositions: *bij, met, op, tussen, van* (near, with, on, between, of) etc.
- numerals: *een, twee, drie* etc. (one, two, three etc.);
  *eerste, tweede, derde* etc. (first, second, third etc.)
- conjunctions: *en, maar, omdat, want*, etc. (and, but, because, for)
- discourse markers: *hé, oh, nou ‘well’, zeg ‘say’ eh*, etc.

We analyzed and counted the words in all analyzable NL and spoken SC utterances and pooled the data over time. Words like *ja, nee, boem* etc. were excluded from this analysis.

### 9.7.1 Different sign/word classes in the input

#### Different sign classes in SLN and signed SC input

In section 7.1.1 we discussed the use of deictic signs or *POINTS* in relation to the use of representational signs. We found that the mothers use a higher percentage of deictic signs with the deaf children than with the hearing children. In this section we want to pay attention, among other things, to the function of these Points - they can be used as personal pronouns, as possessives or as demonstrative pronouns. Table 9.28 presents the data for the different types in NL and spoken SC utterances in the input of the mothers.

**Table 9.28 INPUT DC+HC: Number of various sign types in the SLN and signed SC input of the deaf mothers.**

<table>
<thead>
<tr>
<th>SLN input</th>
<th>to deaf children</th>
<th>to hearing children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstrative pronouns</td>
<td>114</td>
<td>11</td>
</tr>
<tr>
<td>Personal pronouns</td>
<td>30</td>
<td>5</td>
</tr>
<tr>
<td>Possessive pronouns</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Fingerspelling</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Numerals</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Conjunctions</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Discourse markers</td>
<td>22</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>170</strong></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>signed SC input</th>
<th>to deaf children</th>
<th>to hearing children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstrative pronouns</td>
<td>401</td>
<td>658</td>
</tr>
<tr>
<td>Personal pronouns</td>
<td>162</td>
<td>153</td>
</tr>
<tr>
<td>Possessive pronouns</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Fingerspelling</td>
<td>14</td>
<td>22</td>
</tr>
<tr>
<td>Numerals</td>
<td>45</td>
<td>85</td>
</tr>
<tr>
<td>Conjunctions</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Discourse markers</td>
<td>38</td>
<td>64</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>661</strong></td>
<td><strong>984</strong></td>
</tr>
</tbody>
</table>

---

27 In section 7.1.1, POINTS alone were also included. Here we analyzed all analyzable utterances (see Chapter 4).
Overall the signed input to the deaf and hearing children looks very similar both in SLN and in signed SC with respect to these various sign types. In signed SC personal pronouns (i.e. POINTto-me or POINTto-you) seem to occur proportionally slightly more often with the deaf children than with the hearing children. When the total number of deictic signs is considered (demonstrative and personal pronouns) the proportion of personal pronouns in signed SC is larger with the deaf children (29%) than with the hearing children (19%). This difference reflects probably the emphasis on signing with the deaf children.

Of the other categories analyzed finger-spelled signs (predominantly proper names) and conjunctions occur only rarely in the input to the children. Numerals and discourse markers occur proportionally to the same extent with the deaf and with the hearing children.

On the whole we find no difference in the use of sign classes between the input to the deaf and to the hearing children, except that for the deictic signs the ratio of personal pronouns versus demonstrative pronouns is larger with the deaf children than with the hearing children.

**Different word classes in NL and spoken SC input**

Table 9.29 shows the occurrence of function words and numerals in the input to the deaf and hearing children. The percentages of the different categories of function words are from the total number of function words.

For NL we cannot make a comparison between the input to the deaf and to the hearing children. We can compare the NL input of the hearing children to the spoken SC input and we see quite different percentages for the different categories in the two language modes. Proportionally we see more personal pronouns, prepositions and numerals in SC, and more conjunctions and discourse markers in NL.

The spoken SC input to the deaf children differs from that offered to the hearing children, in that the mothers realize fewer articles, demonstrative pronouns and conjunctions, but more personal pronouns, prepositions and numerals to the deaf children. These last three categories are also larger in the spoken SC to the hearing children than in the NL utterances. Spoken personal pronouns may well be 'linked' to Points in SC utterances – we saw in the previous discussion that in SC the mothers used slightly more Points (personal pronouns) in the signed parts of the SC utterances to the deaf children. The simultaneous use of signed Points and spoken personal pronouns may explain the higher percentage of spoken personal pronouns in the SC input to the deaf children.
Prepositions may be used more often as predicates (e.g. tafel op as in ‘put it on the table’) in spoken SC with the deaf children than with the hearing children, and more in SC than in the NL utterances. We have not further looked into this matter. Conjunctions like *en* ‘and’, *maar* ‘but’ or *of* ‘or’ are used far more in NL with the hearing children than in spoken SC. This may be an effect of SLN in the SC utterances. Although we do not know whether or not conjunctions occur in SLN, we know from some studies that sign languages employ other means than lexical conjunctions to co-ordinate or sub-ordinate clauses. In SLN sign conjunctions do exist (e.g. *OMDAT* ‘BECAUSE’ but these are usually loan-signs from Dutch and are used in sign supported Dutch to represent the spoken conjunctions. This might explain the slightly higher percentage of conjunctions in the spoken SC input to the hearing children.

We can conclude that the spoken SC input to the deaf and hearing children differs a great deal with regard to the realization of function words and numerals.

### 9.7.2 Different sign/word classes in the output

**Different sign classes in SLN and signed SC output**

In section 7.1.3 we described how the deaf children produced more deictic signs than the hearing children. We see in Table 9.30 that in SLN the deaf children produce both more demonstrative and personal pronouns in comparison to the hearing children.

---

#### Table 9.29 INPUT DC+HC: Number and (%) of function words in analyzable utterances in NL and spoken SC input of the deaf mothers

<table>
<thead>
<tr>
<th>NL Input</th>
<th>to the deaf children</th>
<th>to the hearing children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Articles</td>
<td>0</td>
<td>9 (13)</td>
</tr>
<tr>
<td>Demonstrative pronouns</td>
<td>0</td>
<td>11 (16)</td>
</tr>
<tr>
<td>Personal pronouns</td>
<td>0</td>
<td>6 (9)</td>
</tr>
<tr>
<td>Possessive pronouns</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Conjunctions</td>
<td>0</td>
<td>28 (40)</td>
</tr>
<tr>
<td>Prepositions</td>
<td>0</td>
<td>4 (5)</td>
</tr>
<tr>
<td>Numerals</td>
<td>0</td>
<td>2 (3)</td>
</tr>
<tr>
<td>Discourse markers</td>
<td>2</td>
<td>10 (14)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2</strong></td>
<td><strong>70</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spoken SC Input</th>
<th>to the deaf children</th>
<th>to the hearing children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Articles</td>
<td>5 (3)</td>
<td>147 (17)</td>
</tr>
<tr>
<td>Demonstrative pronouns</td>
<td>24 (14)</td>
<td>174 (21)</td>
</tr>
<tr>
<td>Personal pronouns</td>
<td>46 (28)</td>
<td>137 (16)</td>
</tr>
<tr>
<td>Possessive pronouns</td>
<td>3 (2)</td>
<td>1 (-)</td>
</tr>
<tr>
<td>Conjunctions</td>
<td>3 (2)</td>
<td>67 (8)</td>
</tr>
<tr>
<td>Prepositions</td>
<td>48 (27)</td>
<td>151 (18)</td>
</tr>
<tr>
<td>Numerals</td>
<td>36 (20)</td>
<td>104 (12)</td>
</tr>
<tr>
<td>Discourse markers</td>
<td>12 (7)</td>
<td>69 (9)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>177</strong></td>
<td><strong>850</strong></td>
</tr>
</tbody>
</table>

* These percentages are from the total of function words
The deaf children produce 21% of personal pronouns within the group of deictic signs. This is higher than the percentage in the SC output, and in the output of the hearing children. It may be that they use Points differently in SLN from the hearing children, and are really acquiring the pronominal system. In contrast, the hearing children seem to use Points more like hearing people do, that is to support their spoken language. However, because the number of these sign types are so few in the SLN output of the hearing children, we have to be careful in interpreting these figures. Pronouns are increasingly produced in SLN from age 2;6 on by the deaf children, as are numerals. Compared to the input the deaf children show very similar percentages of these various sign types.

In signed SC we find no differences between the output of the deaf and hearing children except that the hearing children produce signed discourse markers which the deaf children do not. There were no differences in the input which might explain this. Fingerspelling does not occur in the output. Use of the finger alphabet is connected to the spelling of Dutch words, which we would not expect children to be able to do at this age.

In sum we find little difference between the signed SC output of the deaf and hearing children with regard to the use of these sign types. In the input also we found similar SC regarding these aspects to both groups of children. But in the SLN output there is an indication that the development of the hearing children is different from that of the deaf children, with respect to these sign classes. It will be interesting to follow their development at later ages.

Table 9.30 OUTPUT DC+HC: Number and (%) of various sign types in the SLN and signed SC output of the children. Percentages are of total of these types.

<table>
<thead>
<tr>
<th>SLN output</th>
<th>deaf children</th>
<th>hearing children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstrative pronouns</td>
<td>191 (69)</td>
<td>5 (42)</td>
</tr>
<tr>
<td>Personal pronouns</td>
<td>50 (18)</td>
<td>1 (8)</td>
</tr>
<tr>
<td>Possessive pronouns</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Fingerspelling</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Numerals</td>
<td>25 (9)</td>
<td>5 (42)</td>
</tr>
<tr>
<td>Conjunctions</td>
<td>2 (-)</td>
<td>0</td>
</tr>
<tr>
<td>Discourse markers</td>
<td>10 (4)</td>
<td>1 (8)</td>
</tr>
<tr>
<td>Total</td>
<td>278</td>
<td>12</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Signed SC output</th>
<th>deaf children</th>
<th>hearing children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstrative pronouns</td>
<td>38 (88)</td>
<td>176 (82)</td>
</tr>
<tr>
<td>Personal pronouns</td>
<td>2 (5)</td>
<td>14 (6)</td>
</tr>
<tr>
<td>Possessive pronouns</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Fingerspelling</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Numerals</td>
<td>3 (7)</td>
<td>15 (7)</td>
</tr>
<tr>
<td>Conjunctions</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Discourse markers</td>
<td>0</td>
<td>10 (5)</td>
</tr>
<tr>
<td>Total</td>
<td>43</td>
<td>215</td>
</tr>
</tbody>
</table>
Structural aspects in input and output

Different word classes in NL and spoken SC output

We present the number and percentages of function words and numerals in the NL and spoken SC output of the deaf and hearing children in Table 9.31.

The deaf children do not produce any function words (yet), so we may assume that it is characteristic of their spoken output that they only use nominals and verbs at these points in time, as we might expect from their MLU (see sections 9.1 and 9.2).

In the output of the hearing children we find that articles are occasionally present from age 1;0 on – this seems early compared to the average age of 2;1 found by Schaelaeken and Gillis (1987:124). These early forms are, however, often proto-articles like a schwa-sound before a noun instead of a fully pronounced een 'a' (indefinite pronoun). The children proportionally produce fewer articles than their mothers, both in NL and in spoken SC. Demonstrative pronouns are in the output form age 1;0 on and are used more in NL than in SC, and also more than in their input. However, Sander does not produce any in NL, only in SC. Personal pronouns appear around age 2;0. No possessive pronouns are produced by the hearing children, and these were also absent in the input. There are no conjunctions in NL, but they do occur in SC and in the same percentage as in the input; they appear from age 2;6 on. Prepositions and discourse markers first appear after age 1;6 and numerals occur around age 2;0. Prepositions occur to the same extent in NL and spoken SC, but numerals are more often produced in SC. This can be explained by the fact that the children are usually pointing at different objects while counting; such utterances would be considered SC.

Table 9.31 OUTPUT DC+HC: Number and (%) of function words in analyzable NL and spoken SC utterances of the deaf and hearing children.

<table>
<thead>
<tr>
<th></th>
<th>Deaf children</th>
<th>Hearing children</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NL output</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Articles</td>
<td>0</td>
<td>8 (8)</td>
</tr>
<tr>
<td>Demonstrative pronouns</td>
<td>0</td>
<td>36 (36)</td>
</tr>
<tr>
<td>Personal pronouns</td>
<td>0</td>
<td>30 (29)</td>
</tr>
<tr>
<td>Possessive pronouns</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Conjunctions</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Prepositions</td>
<td>0</td>
<td>15 (15)</td>
</tr>
<tr>
<td>Numerals</td>
<td>0</td>
<td>6 (6)</td>
</tr>
<tr>
<td>Discourse markers</td>
<td>0</td>
<td>6 (6)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>0</td>
<td>101</td>
</tr>
<tr>
<td><strong>spoken SC output</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Articles</td>
<td>0</td>
<td>16 (8)</td>
</tr>
<tr>
<td>Demonstrative pronouns</td>
<td>0</td>
<td>53 (26)</td>
</tr>
<tr>
<td>Personal pronouns</td>
<td>0</td>
<td>32 (16)</td>
</tr>
<tr>
<td>Possessive pronouns</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Conjunctions</td>
<td>0</td>
<td>19 (9)</td>
</tr>
<tr>
<td>Prepositions</td>
<td>2</td>
<td>27 (13)</td>
</tr>
<tr>
<td>Numerals</td>
<td>4</td>
<td>44 (21)</td>
</tr>
<tr>
<td>Discourse markers</td>
<td>0</td>
<td>15 (7)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>12</td>
<td>206</td>
</tr>
</tbody>
</table>
Bol and Kuiken (1988:60) found the following ages for the acquisition of the different word types in monolingual Dutch children:

- **articles**: 1;6 – 2;0
- **possessive pronouns**: 2;6 – 3;0
- **demonstrative pronouns**: 1;6 – 2;0
- **conjunctions (and)**: 2;6 – 3;0
- **personal pronouns**: 1;6 – 2;0
- **prepositions**: 2;0 – 2;6

The hearing children in our study acquire the different types at the same ages as monolingual hearing children do. Unfortunately we have no information on the amount of these function words in the output of hearing children of hearing parents, so we cannot compare the quantities.

We can conclude that the acquisition of the hearing children with respect to these word types is similar to that of Dutch hearing children of hearing parents. It is, however, different from the spoken input of their mothers – the children produce fewer articles, and more demonstrative and personal pronouns and prepositions.

There is again evidence that the spoken part of their SC output is influenced to some extent by signing. In the SC output of the hearing children they produce fewer demonstrative and personal pronouns than in NL. This could be an influence of the use of POINTS in the signed parts of SC, because the need to explicitly name an indicated object or person is then smaller.

### 9.8 Summary

In this chapter we have looked at many different aspects of structure of input and output in the three language modes. When considering the general complexity (MLU and MLUL10) of the signed input we see both an increase in the SLN input and in the signed part of SC for all children. The signed SC has a higher MLU than the SLN for all children. This suggests that this is the main form of communication, but it may also be a result of influence on Dutch in that words are also translated into signs where they would be omitted in SLN. The MLU in Dutch input does not increase over time, nor does the MLU of the spoken part of SC; for the hearing children it even decreases. The MLU of the spoken input for the deaf and hearing children is lower than would be expected in hearing families. The MLU of the SC utterances is greater than the MLU of SLN or NL.

The deaf children show an increase in their MLU in SLN so that it reaches 1.8 to 2.3 signs at age 3 years. The hearing children show almost no increase except Sander. Development takes place between 2 and 3 years. The signed part of SC also develops for all children. The deaf children do not develop their spoken output - it stays at the level of one word. The hearing children on the other hand develop rapidly. Their NL output has a smaller MLU than would be expected from Dutch monolingual children, this is not the case for the spoken part of SC.

In the acquisition literature it is usually seen that the input is slightly ahead in terms of complexity of the output. Here we see that the signed input is only clearly ahead of that of the children in the SC input. In the spoken part the mothers are ahead of
the deaf children; the deaf children show no progress over the two years which cannot be related to input only. They also have an access problem to the spoken input. The mothers' spoken input to the hearing children does not increase and yet the hearing children show a great increase in their spoken MLU. The mothers’ MLU is just greater than that of the children. The hearing children are clearly learning Dutch from other sources (for instance Jonas from his father, Alex and Sander from their older siblings), so the influence of the mothers’ input is not clear. The deaf and hearing children show clear differences in their MLU development, partly as a reflection of their input. The deaf children are clearly developing in sign: SLN and signed parts of SC, whereas the hearing children are showing the most development in Dutch and the spoken parts of SC. They develop less quickly in sign than the deaf children. This is again an indication, as we have already suggested, that the SC is different for the two groups of children in input and output. This differentiation seems to take place after the age of two years, which might be related to the development of visual attention as described in Chapter 6.

The analysis of verbs showed that there are many utterances which have no verb in all three language modes but these decrease over time. In SLN and the signed part of SC the absence of a verb does not necessarily result in an ungrammatical utterance. In Dutch and the spoken parts of SC the absence of a verb was only ungrammatical in about 5% of the cases. The spoken parts of SC miss auxiliaries or copulas, probably under the influence of SLN. In general the linguistic evidence about verbs to the children is limited. In SC utterances if a verb is present it is most often present in both the signed and spoken part. Then we see a clear distinction between the deaf and hearing children in that the deaf children have more utterances with a signed verb and no spoken verb and the hearing children have more often a spoken verb and no signed verb. The children produce an increasing number of signed verbs over time. 35% of utterances of the deaf children have a verb at age 3;0. The hearing children increase their production of spoken verbs; there are no clear differences with hearing children in hearing families.

The children have higher proportions of utterances without a verb than in the input. The hearing children have more SC utterances with a spoken verb and no sign verb than the mothers, which indicates their bias to the spoken language. The difference in the input in terms of use of verbs between the deaf and hearing children is reflected in the output. SC reflects the bias of the deaf children to signing and of the hearing children to the spoken language.

In those utterance with a verb the omission of subjects and objects were analyzed. In SLN both subjects and objects can be omitted whereas in Dutch this is only possible under very restricted circumstances such as in imperative utterances or with topic drop. In SLN the mothers dropped equal amounts of subjects and objects unlike the data reported for adult-adult SLN, where less subject drop occurs. This may be a result of the here-and-now character of the interaction. In Dutch and the spoken
parts of SC more subject and object drop occurred with the deaf children than with
the hearing children. This resulted in more ungrammatical Dutch (31%) for the deaf
children than for the hearing children (9%). In SC utterances where both verbs
where realized, the signed subject was often omitted. This emphasizes again that SC
is looking more SLN-like for the deaf children and more Dutch-like for the hearing
children.

In SLN the children drop subjects to a similar extent as in the input, although it
could be argued that this is related to general acquisition principles (see Chapter 2).
In Dutch the hearing children drop subjects to an extent which would be expected
for hearing children in hearing families at this age. The input does not clearly have
an influence here. The deaf children show similar proportions of subject and object
drop input in their utterances as in the input. The hearing children follow the Dutch
rules to some extent. Interestingly they drop more spoken subjects in SC where the
verb is expressed in both modes. This may indicate a slight influence of SLN on
their production in the simultaneous mode.

Dutch and SLN have different rules for verb position in utterances. There were a
large number of utterances in all three modes in which there was only a verb. In
those utterances which could be analyzed for verb position the verb was most often
in final position for SLN, as is to be expected in adult SLN. In Dutch the verb was
in first position, mostly grammatically, or in second position. There was little
ungrammaticality (13%). These results were reflected in the signed and spoken
parts of SC, except that the deaf children had more ungrammatical verb positions in
the spoken part than the hearing children.

All the children follow in general the order of SLN utterances as in the input in the
SLN utterances and SC utterances with a signed verb. The hearing children do not
follow the input order in their Dutch and spoken parts of SC utterances but behave
as monolingual Dutch children in hearing families in that they initially place the
verb in final position in an non-finite form and later produce the verb in second
position. The hearing children produce more verbs in final position in the SC
utterances that have both a spoken and signed verb than in other contexts, which
may reflect an influence of SLN in the simultaneous mode. This is unlike the input.
The form of the signed verbs produced is predominantly the citation form and in
this period there is no clear increase in morphological inflection of whatever type.
In Dutch the finite forms are common, although they are used more with the
hearing children as are auxiliaries and modals. The input to the hearing children is
similar to what hearing children in hearing families receive. The mothers produce
more stem forms with the deaf children. There is no clear development here either.

In the signed output the deaf children and hearing children both mainly produce
citation forms as in the input. They are starting to produce inflected forms around
two years but the deaf children have a greater range of types of inflection. The forms
that the deaf children produce were all present in the input. The input is not
different in the variety provided so that the slower acquisition of the hearing
children reflects their greater orientation on spoken language. The hearing children
produce spoken verb morphology as could be expected from children in hearing
families; the input was also not different. The output of the hearing children in their NL utterances is very similar to the spoken parts of SC utterances, although the SC utterances are more complex. This is their main communication mode with their deaf mothers.

In SLN non-manual markers are used as grammatical markers of questions and negatives. These all increased with time in the input. The increase in the use of the question markers did not occur with all children at age two years as might be predicted on the basis of the literature. There was no relation with the children's production of their first wh-question signs. The mothers used the non-manual negative marker on its own with the deaf children but only with a negative lexical sign with the hearing children, this is less SLN-like although not ungrammatical. The children produce almost no non-manual question markers despite the input. The deaf children produce non-manual negation markers. They also produce negative signs between age 1;6-2;6. They produce the non-manual markers without a manual sign as in the input; the hearing children do not. They also do not use negative signs.

The deaf children use negative words with a head-shake in SC but not in their Dutch output. This indicates an influence of SLN. The deaf children do not produce negative words at all.

A brief examination of other word classes showed that there were different forms present in the input such as fingerspelling or discourse markers but these were barely produced by the children. The deaf children produced more personal pronouns than the hearing children and these were also more present in the input they received.

For a consideration of all of these aspects we see that the input to the deaf and hearing children looks structurally different in that in SC, which is the main mode to both deaf and hearing children, the structure of SC utterances starts to look different as the children get older. This is reflected in the output: the hearing children are much more oriented to spoken language although they are also learning some SLN. The deaf children are solely oriented towards SLN.