The acquisition of "optional" movement
Zuckerman, Shalom

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Chapter 6

Auxiliary+Infinitive Structures in Child Dutch

1. Introduction

This chapter investigates auxiliary+infinitive (aux-inf) structures in child Dutch. At first glance, these structures do not fall into the same category as the cases of “optionality” presented in previous chapters. These seem to be cases in which children fail to perform an obligatory V2 operation the target grammar requires; consequently, they produce an illegitimate aux+inf structure. Nonetheless, this is relevant to this investigation because it shows that a misanalysis of input data can produce structures that learners see as optional. In the first part of this chapter, I will describe the data and the previous accounts of it; later I will relate it to the current discussion. In the second part, I present experimental data that supports the main proposal of this work and claim that auxiliary + infinitive constructions in Dutch are considered by children as optional.

1.1 The phenomenon

It has been observed (e.g.: Jordens 1990, Roeper 1991, Evers and van Kampen 1995, Hollebrandse and Roeper 1996, van Kampen 1997) that Early Dutch includes sentences such as (1) below, which are ungrammatical in the adult language:

(1) Ik doe ook verven       (Niek 3;10.2, CHILDES, Wijnen Corpus)
    I   do  also paint(inf)

In principle doen ‘do’ is not an auxiliary verb in Dutch except in specific contexts such as VP-topicalization, (see Reuland 1983). The correct form of (1) is:

(2) Ik verf                 ook
    I  paint (V-finite) also

The use of such ‘doen’ constructions is said in the literature to constitute a stage in child grammar, roughly characteristic of ages 2-4, during which children use both
the correct finite form as well as ‘doen’ constructions with a nonfinite verb. Several authors point out that children of these ages make use of other auxiliaries (or modals) in the same manner, such as ‘gaan’ (= go), as shown in (3) below.

(3) Ik ga kleuren (Niek 3;10.2, CHILDES, Wijnen Corpus)
    I go draw(inf)

The fact that children produce sentences such as (3) is not surprising of course, since (3) is grammatical in Dutch under a future-modal reading (= “I’m going to draw”). The claim however, and this will be the claim in this chapter as well, is that children often don’t produce (3) under the modal reading but rather as a description of an ongoing event (= “I’m drawing”). That is, the ‘gaan’ constructions and the ‘doen’ constructions are considered to differ only in respect to the auxiliary that is used. Most existing accounts of this phenomenon relate it to the process of acquiring verb movement. Before turning to a review of existing analyses and to the current proposal, let us take a look at the properties of verb movement in Dutch relevant to the current discussion.

### 1.2 Verb movement in adult and child Dutch

Two asymmetries characterize verb movement in Dutch. The first is the matrix / embedded asymmetry, demonstrated in (4), below and the second is the finite/ nonfinite asymmetry, demonstrated in (5) below.

(4)a. De man leest een boek
    The man reads a book
    * De man een boek leest
    the man a book reads

    b. * dat de man leest een boek
    that the man reads a book
    dat de man een boek leest
    that the man a book reads

(5)a. De man leest een boek
    The man reads a book
    * De man een boek leest
    the man a book reads

    b. *De man wil lezen een boek
    The man wants read(inf) a book
    De man wil/ gaat een boek lezen
    The man wants/ goes a book read (inf)
The asymmetry in (4) concerns verb-movement rather than verb-finiteness, since the verb 'leest' (reads) is finite in both matrix and embedded contexts while only in the matrix clause it is also moved. The asymmetry in (5) reflects the relationship between verb-movement and verb inflection - when the verb in the matrix clause is finite, it moves to the second position and when it is non-finite it remains in situ. Research has shown that Dutch-speaking children master the asymmetry in (5) from the earliest recorded stages. Even in early two-words structures, children produce virtually no non-finite verb in a pre-object position and no finite verb in a post-object position. It might be concluded from this finding that Dutch-speaking children master verb movement from the earliest stages (and that the relevant parameter is either never mis-set or set to the correct value in a stage previous to the onset of speech). Nevertheless, examination of the two different asymmetries in (4) and (5) above shows that mastery of the movement-finiteness asymmetry does not tell the whole story. It has yet to be established that children do not fail to move the verb in matrix clauses when compared to embedded clauses. Two problems must be considered in order to understand whether this is in fact the case. The first is that most spontaneous speech corpora include only a small number of embedded clauses and a proper comparison of them to matrix clauses is not possible. The second is that if children use a 'gaan-insertion' structure in order to avoid movement in matrix clauses, it will only rarely be detected by the investigator, since these structures are identical to the grammatical modal structures. One can rarely establish the intention of the child when she utters a structure such as "ik ga kleuren" (= I go draw). Even if the child uses 'ga' as a dummy auxiliary and actually says: "I am drawing", and not: "I am going to draw", the investigator will likely miss that intention and judge the sentence as grammatical.

1.3 Previous accounts

Jordens (1990) observes the use of doen-inf and gaan-inf in the spontaneous speech of his 2-2;6 year old child. He analyses the use of aux-inf constructions and compares them to the production of lexical finite verbs in second position and to root non-finite verbs in final position. Based on this comparison, Jordens makes the observation that the use of a finite auxiliary cannot be taken to indicate the acquisition of V2, but rather indicates the acquisition of finiteness. He shows that
the increase in the production of aux-inf structures is not accompanied by an increase in the use of lexical verbs in second position (which remains stable during the ages of his study), but rather by a decrease in the use of root non-finite verbs in final position. By the time Jordens’ subject is 2;6 she produces 59.4% Mod/aux + inf structures and only 31.2 % lexical verbs in non-final position. Based on an analysis of the aux-inf structures, he claims that there is an increasing tendency to use the aux-inf patterns instead of the correct equivalent with verb movement. Jordens makes a distinction between the realization of a finiteness feature and the realization of it through verb movement. The children already know that the finiteness feature must be realized, but do not yet understand the associated verb movement. According to Jordens, the aux+inf phenomenon is thus an intermediate stage between the early stage, which shows no knowledge of finiteness at all (characterized by root infinitive clauses) and the final stage, which shows realization of both finiteness and movement.

Jordens further observes that ‘doen’ and ‘gaan’ structures also occur in the input, ‘doen’ as a part of (some) caregivers’ speech and ‘gaan’ as a structure with an aspectual meaning of ‘is going to’. This observation is crucial to the current discussion. Lalleman (1986) claims that caregivers make use of the ‘gaan’ structures to indicate present tense as well. Jordens offers a semantic account to postulate when children abandon the aux-inf structures and reach the final stage. “The periphrastic use of ‘doet’ and ‘gaat’ + inf will decrease in favour of systematic verb fronting as soon as the child acquires a sense of the semantic difference between a particular aux+inf pattern and its corresponding V-finite alternative" (Jordens 1990, p.1437).

Van Kampen (1997) reports similar findings with respect to doen/gaan + inf structures based on her investigation of the spontaneous speech of two children during the ages of 1;9 to 10;0 and 1;7 to 7;0.

The account van Kampen proposes for the aux+inf phenomenon is a 'least-effort' account. Her assumption is that children initially prefer to avoid V2 movement by the insertion of 'do' and modal constants as a 'least effort' performance strategy. This account views the aux+inf phenomenon as an intermediate stage that precedes the final stage in which the child realizes the full function of the C position in Dutch. It is when children clearly establish the V2 rule that the use of aux+inf structures will decrease (although they are not completely abandoned). Unlike Jordens (1990), van
Kampen assumes that the 'doen' and 'gaan' elements do not function as carriers of finiteness markings and treats them (following De Haan 1987) as modal constants, which are not yet identified as verbs. The reason the child allows these elements to appear in the C position, claims van Kampen, is that these elements do not have L-properties and are thus allowed in the C position. This is a crucial difference between the two accounts. According to Jordens (1990), children at this stage have already realised the relationship between the V2 position and finiteness while, according to van Kampen, this relationship has yet to be established.

Van Kampen embeds her least effort account within a larger view of the acquisition process (presented in van Kampen 1997) according to which the early stages of language acquisition are characterised by a tendency to avoid LF-PF discrepancy. By inserting an aux/modal directly into C, Van Kampen claims, the child creates a structure that is closer to the LF representation of the structure than the adult V2 option is.

Van Kampen notices that the least effort approach leads to a prediction: aux + inf structures should not occur in embedded clauses, since movement is not required in embedded clauses in Dutch. Van Kampen observes that in her spontaneous speech data embedded clauses in fact do not contain aux+inf structures. This prediction will be supported by the experimental data in this chapter. According to van Kampen's analysis the aux+inf phenomenon is not primarily input-related and the decrease in the occurrence of this structure is dependent on syntactic rather than semantic discoveries made by the child.

Hollebrandse and Roeper (1996) (H&R) propose an account for do-insertion in Dutch and English. Their data also includes cases of 'tense doubling' (see (6), below) but do not mention cases such as 'gaan'-insertion.

(6) I didn't broke this (Sarah 3;10:16, Stromswold 1990)

The analysis H&R propose to account for these data is based on the following assumption (and on children's knowledge of it):

(7) A tense domain has to be c-commanded by the tense morpheme.
Assuming that verbs are retrieved from the lexicon fully inflected, the correct strategy for satisfying the requirement in (7), H&R claim, is substitution, which involves movement and relabeling of the complex V as T. However, substitution is assumed to be problematic for children, and in order to prevent the derivation from crashing, they choose to spell out the tense morpheme and in this way fulfil the c-command requirement. The view of do-insertion as a phonological spell-out rather than as a syntactic insertion distinguishes H&R's analysis from Jordens’ (1990).

In one respect, H&R’s analysis is a 'least effort' analysis since it assumes that children prefer the spell out strategy because it is more economical than the relabeling required by the substitution option. Nevertheless, the H&R analysis leads to predictions different from van Kampen's. While van Kampen predicts an absence of do-structures in embedded clauses in child-Dutch, H&R predict that do-structures should appear in embedded clauses as well as in matrix clauses, since the demand for c-command, presented as the motivation for the do-structures, is valid in both embedded and matrix clauses.

To conclude, we have seen three attempts to account for the aux+inf phenomenon, all of which view it as characteristic of an intermediate stage in child grammar. Jorden's analysis can be described as semantically-based and related to the input. Van Kampen's account is not input-related and considers this stage to be driven by economy and by the need to reduce LF-PF discrepancy. H&R relate the phenomenon primarily to the need for a tense morpheme to c-command the tense domain and propose that the aux is not inserted but rather 'formed' as a spell-out of the tense morpheme.

The next sections propose a new account and present new findings.

1.4 The proposed account

The proposed account follows the main proposal made in chapter 3 of this dissertation for the acquisition of optional movement. According to this approach, children faced with word-order optionality in their input will tend to reject the existence of different word orders that carry the same interpretation, and will prefer the more economical option. The proposal here is that children mistakenly consider the gaan-structure to be identical in interpretation to the standard V-movement option, and thus consider it a grammatical option for describing an ongoing event. As for the doen-structure, the claim is that in this early stage children fail to properly
distinguish the dialect from the standard language. Children therefore face the same problem here as they do in the cases of optionality in the input discussed previously in other chapters of this dissertation. Children's solution to this problem is to reject the possibility of true optionality and to prefer the more economical structure, namely the aux+inf structure, which includes no verb movement. However, the case of aux+inf structures in Dutch is particularly relevant to the current discussion since the aux+inf structure is more economical than the standard structure only in matrix clauses (because in embedded clauses the verb remains in-situ). Children are aware of two available options and they prefer one of them in matrix clauses and the other in embedded clauses, following economy considerations. As proposed by Jordens (1990), when children understand the obligatory modal reading of the gaan structure in the standard language, they cease to produce the aux+inf structure. In principle, the account proposed here draws elements from each of the three existing accounts. Following Jordens, it assumes that the source of this phenomenon is the inability of children to distinguish the inchoative interpretation from one of an ongoing event. Following Van Kampen it assumes that economy plays a role in children's choices between the alternative and following H&R, it assumes that these structure are the result of phonological realization, rather than syntactic insertion.

1.5 Main claims

In this chapter new evidence from an experimental investigation of ‘aux+inf structures’ is presented, resulting in the following claims:

(i) Aux+inf structures appear in child Dutch only in matrix clauses and not in embedded clauses, (as predicted by van Kampen 1997).

(ii) The type of aux used by the child in these structures depends on input-related factors. That is, in environments where doen is allowed in the dialect, children will prefer doen-insertion and in environments of only standard Dutch input, the gaan-insertion will be preferred.

(iii) Aux+inf structures are characteristic of a stage in early Dutch. Older preschool children produce almost no aux+inf structures.
(iv) Dutch speaking children under 4 years of age view the gaan+inf structures ((3), above) that appear in their input as ambiguous ones that can have a present-ongoing event reading as well as the standard future-modal reading.

Claims (i) to (iii) above will be tested with a sentence completion experiment with children of two age groups from the northern and the southern parts of the Netherlands. Claim (iv) will be supported by results of a sentence-comprehension experiment.

2. Experiment 1: completion

Methods:

Subjects:
10 Dutch speaking children (5 from Limburg- in the south of the Netherlands and 5 from Groningen-in the north), ages 3;0 - 3;11, mean age: 3;5. The children from Limburg are all exposed to the Limburgs dialect at home and in their day-care center; they are productive users of both the dialect and standard Dutch. The children from Groningen are exposed only to standard Dutch. It is important to note that the experiment was conducted in standard Dutch for all children.

A second group of 14 Dutch speaking children (all from Limburg), ages 4;8 - 5, was used as a control group.

A note on the Limburgs dialect:
In the Limburgs dialect, spoken in the south-east of the Netherlands, 'doen'-structures (as in (8), below) are considered grammatical and are attested in adult language, although they are usually described as childish and are characteristic of child-directed speech. An observation crucial to our discussion here is that the Limburgs dialect also allows 'doen'-structures to occur in embedded clauses as demonstrated in (9) below. This fact is supported by speaker's judgements as well as the author's observations.

(8) Limburgs: Ik doon speulen
S. Dutch: *Ik doe spelen
English: I do play(inf)
(9) Limburgs: As dich duis valle .....  
S. Dutch: *Als je doet vallen......  
English: If you do fall(inf) .....  

Materials and Procedure  
A sentence completion test was used, in which the subject had to produce a finite verb and object. Two pictures were presented to the subject. The experimenter presented the pictures through a coordination structure in which the first conjunct was fully produced by the experimenter and the second conjunct was truncated. The subjects were asked to complete the sentence (that is, to produce the verb and the object). The sentences were divided into two conditions: matrix sentences (VO condition) for which the correct answer was verb-object, and embedded sentences (OV condition) for which the correct answer was object-verb.  

(10a) Experimenter:  
Dit is de man die het brood snijdt en dit is de man die de tomaat snijdt. Dus deze man snijdt het brood en deze man ... subject: snijdt de tomaat: VO  
This is the man who the bread cuts and this is the man who the tomato cuts. So, this man cuts the bread and this man..... subject: cuts the tomato: VO  

(10b) Experimenter:  
Deze man snijdt het brood en deze man snijdt de tomaat. Dus dit is de man die het brood snijdt en dit is de man die ....subject: de tomaat snijdt: OV  
This man cuts the bread and this man cuts the tomato. So, this is the man who the bread cuts and this is the man who ... subject: the tomato cuts: OV  

In the verb-object (VO) condition (10a), the verb has been moved (Verb Second), in the object-verb (OV) condition (10b) it is in its base-generated position. 34 picture-pairs were presented, half in the VO-condition and half in the OV-condition.  

Results:  
The results of the experiment are presented in table 1 below. A quotative analysis of the difference between children's responses to the matrix-VO condition and to the embedded OV condition reveals a significant difference. While in the OV condition children produced 126 correct responses out of 141 items (89%), in the VO condition they produced only 71 out of 145 items (49%) correctly. This
significant difference ($t=-5.734$, $df=18$, $p<0.05$) reveals that Dutch-speaking children ages 3-4 have problems with matrix clauses that include overt movement of the main verb (an ANOVA all responses comparing the matrix and embedded conditions results with $F=32.876$, $df=19$, $P<0.05$). The comparison between embedded and matrix clauses helps identify the problem children face as one of verb movement rather than verb finiteness (since the verb is also inflected in the embedded clauses, which were produced correctly in an almost adult manner).

Table 1. Responses of the individual children (younger group), $n=10$.

Matrix clause (VO condition)

<table>
<thead>
<tr>
<th>Age</th>
<th>Total</th>
<th>Good</th>
<th>$V_{\text{fin}}$</th>
<th>aux-</th>
<th>V-</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>final</td>
<td>insertion</td>
<td>omission</td>
<td></td>
</tr>
<tr>
<td>Rowin</td>
<td>3:10</td>
<td>17</td>
<td>11</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bo</td>
<td>3:6</td>
<td>9</td>
<td>2</td>
<td>6</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Nils</td>
<td>3:10</td>
<td>17</td>
<td>14</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teun</td>
<td>3:11</td>
<td>12</td>
<td>6</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Thom</td>
<td>3:2</td>
<td>9</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Total Limb.</td>
<td>64</td>
<td>37</td>
<td>1</td>
<td>10</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Justin</td>
<td>3:2</td>
<td>17</td>
<td>6</td>
<td>10</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Tessa</td>
<td>3:0</td>
<td>17</td>
<td>10</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jelle</td>
<td>3:7</td>
<td>17</td>
<td>5</td>
<td>4</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>Dagmar</td>
<td>3:9</td>
<td>13</td>
<td>3</td>
<td>2</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Lena</td>
<td>3:0</td>
<td>17</td>
<td>10</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Total Gron.</td>
<td>81</td>
<td>34</td>
<td>8</td>
<td>23</td>
<td>12</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>145</td>
<td>71</td>
<td>9</td>
<td>33</td>
<td>22</td>
<td>10</td>
</tr>
</tbody>
</table>

Embedded clause (OV condition)

<table>
<thead>
<tr>
<th>Age</th>
<th>Total</th>
<th>Good</th>
<th>$V_{2}$ (VO)</th>
<th>aux-</th>
<th>V-</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>insertion</td>
<td>omission</td>
<td></td>
</tr>
<tr>
<td>Rowin</td>
<td>3:10</td>
<td>17</td>
<td>16</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bo</td>
<td>3:6</td>
<td>8</td>
<td>6</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nils</td>
<td>3:10</td>
<td>17</td>
<td>16</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teun</td>
<td>3:11</td>
<td>11</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thom</td>
<td>3:2</td>
<td>9</td>
<td>6</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total Limb.</td>
<td>62</td>
<td>55</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Justin</td>
<td>3:2</td>
<td>17</td>
<td>16</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tessa</td>
<td>3:0</td>
<td>17</td>
<td>15</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jelle</td>
<td>3:7</td>
<td>17</td>
<td>16</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dagmar</td>
<td>3:9</td>
<td>11</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lena</td>
<td>3:0</td>
<td>17</td>
<td>13</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Total Gron.</td>
<td>79</td>
<td>71</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>141</td>
<td>126</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>6</td>
</tr>
</tbody>
</table>
Apart from correct responses, the children produced 3 types of errors:

Word order error: the child produces a word order opposite to the expected one. An OV order in the embedded clause is labeled a $V_{\text{fin}}$-final error. A VO in the matrix clause is labeled as V2 error. As stated above, both these errors are considered marginal or non-existent in spontaneous speech of Dutch children.

Aux+inf structures error: The child produces a finite auxiliary in second position and a non-finite main verb in final position. This error, which is the topic of this chapter, occurred 33 times (22% ) when the matrix order was the target, and 3 times (2%) when an embedded clause was the target. Two forms of auxiliary were used: the auxiliary 'doet' and the modal 'gaat'. 'Doet' was used exclusively by the Limburg children, and 'gaat' was used exclusively by the Groningen children.

Verb-omission error: The child produces only an object, without the verb as demonstrated in (13):

This error occurred 22 times (15%) with a matrix clause target and 2 times (2%) with an embedded clause target. Omission of the verb in the second conjunct of a coordination is grammatical in Dutch matrix clauses (as it is in English and many other languages) as demonstrated in (11) below; these structures are referred to as 'gapping' structures (Ross 1967):

(11) Gapping:

John studies chemistry and Bill e physics.

Since gapping is grammatical in Dutch, the decision to count these responses as incorrect is questionable but will be justified in the discussion section.

Cases in which children did not respond or responded irrelevently, were classified as 'other'.

Table 2 and 3, presented below, shows the distribution of the aux+inf responses for the younger and the older children, respectively.

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Aux+Inf structures responses in matrix and embedded clauses in younger children group (n=10)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Limburg</td>
</tr>
<tr>
<td>Embedded</td>
<td>1 / 62</td>
</tr>
<tr>
<td>Matrix</td>
<td>10 / 64</td>
</tr>
</tbody>
</table>

$t=2.583, df=18, p<0.05$ for difference between matrix and embedded, $t=-1.149, df=18, p>0.5$ for difference between Limburg and Groningen
Table 3  
**Aux+inf structures / total older children  n=14**

<table>
<thead>
<tr>
<th></th>
<th>Older children (4:8-5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Embedded</td>
<td>0 / 210</td>
</tr>
<tr>
<td>Matrix</td>
<td>6 / 210</td>
</tr>
</tbody>
</table>

### 3. Discussion

#### 3.1. Aux+inf structures

Table 2 above presents the aux+inf responses for the younger children from the two different regions. Note that responses with *doet* and with *gaat* as the auxiliary are both inappropriate in the context created in this experiment. The *doet* cases are ungrammatical because the experiment was conducted in standard Dutch in which these structures are ungrammatical. The *gaat* cases are inappropriate because all the pictures presented to the children described activities clearly taking place in the present (for example, a picture of a man cutting bread with the knife actually in the bread and one slice already cut; a picture of a cat scratching a boy with the cat’s paw actually touching the boy’s leg and so forth); thus, a future-modal interpretation with the adult usage of *gaan*-structures would have been inappropriate.

Table 2 reveals that children produced far more aux+inf responses in matrix clauses than in embedded clauses. This difference shows that children’s use of aux+inf structures does not simply parallel the adults’ use, nor does it reflect the need for a C-command relation as proposed by Hollebrandse and Roeper (1996). The difference also rules out the possibility that the ‘*gaan*’ structures are adult-like structures with a future-modal reading (since this is allowed also in embedded clauses). The difference makes clear that the use of the aux-inf structure has to do with economy, as proposed by van Kampen (1997). That is, the children see the aux-inf structure as a legitimate alternative to the V2 structure and choose it because it is more economical (as it involves no V-movement) than the adult option. In the embedded clause, the relationship of the options changes. The adult structure, which involves no V-movement, is more economical than the aux+inf structure, which involves insertion or realization of an extra element. Therefore, the adult structure is chosen and the aux+inf structure does not appear in embedded clauses.

A second finding is that there is a difference between the children of the two regions, with respect to the auxiliary being used. The children from Limburg, who
had been exposed to a dialect that allows 'doen' structures, used 'doen' in all the cases of aux+inf, while the children from Groningen, who had not been exposed to a dialect, used 'gaan' exclusively as the auxiliary in these structures. This difference indicates that there is an input-related factor playing a role in this phenomenon. Children do not simply insert or realize a dummy element, but rather they base their production on similar structures of aux+inf that appear in their input. Furthermore, table 3 shows that the older children produced only 6 cases of aux+inf out of a total of 210 responses. This finding supports the claim that the aux+inf structure is characteristic of a stage in child language that disappears by the age of 4.

3.2. V-Omission

Recall that V-omission responses were counted as errors in the original classification and analysis of the data. Should the V-omission responses be counted as correct, as if they were grammatical 'gapping' responses, or as incorrect, as if they reflected a simple omission of the verb from the second conjunct (without a basis on an antecedent relation with the verb of the first conjunct as assumed for 'gapping')? Below are five reasons to believe V-omission responses are not gapping:

- First, gapping-structures are considered more complex than the full coordination structures and children of the tested ages are claimed not to use them spontaneously. Tager-Flusberg, de Villiers and Hakuta (1982) and Lust, Pinhas and Flynn (1980) report, based on experimental studies, that children fail to produce, to correctly imitate, and to understand such structures.
- Second, the results from the older children show a significant decrease in the use of this V-omission response (16% for Group 1 and 3% for Group 2).
- Third, the V-omission response and the aux+inf structure response seem to disappear at the same time (the older children produce a non-significant number of both of these errors), again indicating that these responses represent an early stage of trying to avoid overt movement and not an adult-like behavior.
- Fourth, one child from group 1 and two children from group 2 omitted the verb in the embedded clause (dit is de man die het brood snijdt en dit is de man die... de tomaat: this is the man who cuts the bread and this is the man who ... the tomato), an ungrammatical response that would not be expected under the assumption that these are gapping structures.
Fifth, note in table 1 that the aux-inf responses and the V-omission responses are in complementary distribution. It seems that children tend to choose one of these two options as their strategy for avoiding V-movement.

The claim that these structures are V-omission rather than gapping gives rise to a new prediction: in a language that has V-movement but shows no asymmetry between matrix and embedded clauses, V-omissions will occur equally in matrix and embedded clauses. In order to test this prediction the same experiment was conducted with 15 Hebrew speaking children. Hebrew is claimed to be an SVO language with verb movement (V to I) in both matrix and embedded clauses, as demonstrated in (12,13), below. In addition Hebrew resembles Dutch in that gapping is allowed only in matrix clauses. Hebrew, therefore, qualifies as a suitable language for testing the prediction above.

(12) ha-ish ha-ze xotex t lexem
     the-man the-this cuts       bread
     ‘this man cuts bread’
(13) ze ha-ish she xotex t lexem
     this the-man that cuts       bread
     ‘this is the man who cuts bread’

Results: only 7 out of the 15 children made any errors, all of which were V-omission errors. These errors are presented in table 4 below:

<table>
<thead>
<tr>
<th>Table 4</th>
<th>V-omissions in Hebrew speaking children</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hebrew speaking children (3-4), n=7</td>
</tr>
<tr>
<td>Embedded</td>
<td>9/145</td>
</tr>
<tr>
<td>Matrix</td>
<td>8/148</td>
</tr>
</tbody>
</table>

As is clear in table 4, Hebrew speaking children produce V-omission errors in equal numbers whether the target is a matrix clause or an embedded clause. Since gapping is ungrammatical in Hebrew embedded clauses, as it is in Dutch, this result is consistent with prediction above and supports the conclusion that the V-omission responses in the experiment with Dutch children were not grammatical gapping structures but rather ungrammatical responses that omitted the verb in contexts in
which the verb had to undergo movement. This justifies the decision to count these responses as incorrect.

The V-omission responses, like the aux+inf responses, support an economy-based approach since they occur only with the less economical target in matrix clauses. However, the type of economy that the V-omission errors support seems to be a 'local' one. Recall that, in the first part of this dissertation, we adopted a 'global' approach to the economy characterizing child language, claiming that children would fail to produce a less-economical structure only in the presence of a more-economical alternative. The current V-omission errors, like the aux-omission errors in chapter 4, seem to support a 'local' approach, according to which any movement operation is a possible subject for errors in child language, even without the presence of an alternative in the input. However, as suggested in the discussion of the aux-omission errors reported in chapter 5, it might be that (some) children think that omitting the verb is a legitimate alternative in this structure and thus opt to do so. This analysis depends on the assumption that omitted (or null) elements are more economical than overt ones. The fact that children seem to produce either the aux+inf structure or the V-omission structure, but not both, instead of the V2 structure, supports this analysis, suggesting that (presumably depending on input factors) the child will analyze one of these structures as a legitimate alternative for the V2 option.

We can support the 'global' approach by showing that, in the absence of gaat-structures in the input, children will not use the aux+inf structures in their early language, but will perform V-movement. This observation is made by Peter Jordens (personal communication), who observes that in German, which does not allow gaat-structures as inchoative in the adult grammar, children do not produce structures of the aux+inf type. Furthermore, an experiment in progress at the University of Groningen (Reitsma 2001) shows that also in Frisian, another Germanic language that does not have an inchoative-gaat, the aux-inf stage seems to not appear.

3.3. Conclusions

The data and discussion above allow a number of conclusions to be drawn. Although Dutch-speaking children seem to understand the relationship between finiteness and syntactic position from early ages, they do not acquire V-movement
instantly. Rather, they go through a stage in which aux+inf structures are used as a substitute for V2 structures. This stage seems to be resolved around age 4. Children allow such structures due to the misinterpretation of ‘gaan’-structures in their input as describing an ongoing event, and of ‘doen’-structures as part of the standard language rather than the dialect. In this respect, the current account is an input-based account. The relationship of children’s productions to their input is also supported by the choice of auxiliary (‘doen’ or ‘gaan’), which depends on the level of exposure to a dialect. Children do not produce this structure in embedded clauses because in embedded clauses these structures are not more economical than the adult form, and thus are not preferred. In this respect the current account is an economy-based account.

The main conclusions of the discussion above are dependent on an assumption that still needs empirical support. This assumption is that children see the ‘gaan’ structures in their input as (optionally) describing an ongoing event. Experiment 2, presented below, investigates this assumption through a comprehension experiment.

4. Experiment 2: comprehension

Research hypothesis: Dutch-speaking children ages 3-4 do not know the obligatory future-modal interpretation that the auxiliary verb ‘gaan’ carries in their target grammar and might interpret it to indicate present tense.

Methods:
Subjects:
Children of two age groups participated in the experiment; all were from Groningen:

- 28 Dutch speaking children ages 2;9 - 3;10, mean age: 3;6
- 19 Dutch speaking children ages 7;0 - 8;3

Procedure:
A picture selection task was used to determine children’s interpretation of the investigated structures. The children were shown a set of three pictures, each on one sheet of A4 paper. The three pictures represented an action in three different time aspects: present, future and past. For example, one set of pictures portrayed
the action of sawing. One picture showed a man walking with a saw in one hand and a whole piece of wood in the other, thus indicating a future-modal reading (the man is going to saw). A second picture showed the man in the process of sawing, thus indicating a present tense reading (the man saws or the man is sawing). The third picture showed the man with the saw and the wood cut into two pieces, thus indicating a past tense (the man sawed). A pre-test training session included two sets of pictures and the main session included ten sets of pictures. The experimenter asked 3 questions about each set of pictures: one question referred to a present-tense reading (see 14a, below), one referred to a future reading (14b) and a control question that referred to either a past-tense reading (14c) or to a present-progressive reading, which in Dutch takes the aan het form (14d).

(14) a. welke man zaagt?
   which man saws?

b. welke man gaat zagen?
   which man goes saw(inf)
   ‘Which man is going to saw’?

b. welke man heeft gezaagd?
   Which man has sawn (part.)
   ‘Which man has sawn’?

d. Welke man is aan het zagen?
   Which man is on the saw(inf)
   ‘Which man is sawing’?

The child presented with the stimulus question was asked to point to the picture that represents the correct answer.

Notice that although there were four possible questions, there were only three possible answers (the three pictures) since the present simple question (a, above)

37 The test used in this experiment is based on an experiment used in Bastiaanse and Prins (1984) and Prins (1987) to test comprehension of tense of aphasic patients. I thank these authors for their permission.
38 The 3 questions for the same set of pictures were not presented one after the other. First the 10 sets of pictures were shown and one question was asked about each. Then they were shown a second time and a different question was asked about each set. They were then shown a third time, and the final question was asked.
39 In Dutch the use of simple present in this case is acceptable and productive, unlike the English parallel for which a progressive form sounds much more natural.
40 In Dutch the use of past participle is much more common than the simple past for both children and adults and therefore it was used in the questions.
and the present progressive question (d, above) were both correctly answered by the same picture.

The first two sets of pictures were presented as training trials, accompanied by an explanation of the difference between the different pictures. In this trial the child was corrected if she gave a wrong answer. Thus there were 2 pre-test trials and 30 test trials.

One experimenter presented the stimulus questions and a second wrote down the responses of the child. The sessions were recorded with an audio tape recorder as well. In cases in which the child changed his mind before the experimenter turned to the next picture, the last response of the child was counted.

Results and discussion:

The results are shown in table 7

<table>
<thead>
<tr>
<th>Table 7</th>
<th>general responses of the 28 children</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>present</td>
</tr>
<tr>
<td>Response</td>
<td></td>
</tr>
<tr>
<td>Stimulus</td>
<td></td>
</tr>
<tr>
<td>Present</td>
<td>(n=9)</td>
</tr>
<tr>
<td></td>
<td>160 (63%)</td>
</tr>
<tr>
<td>Future</td>
<td>(n=10)</td>
</tr>
<tr>
<td></td>
<td>148 (53%)</td>
</tr>
<tr>
<td>Past</td>
<td>(n=6)</td>
</tr>
<tr>
<td></td>
<td>33 (20%)</td>
</tr>
<tr>
<td>Aan het</td>
<td>(n=5)</td>
</tr>
<tr>
<td></td>
<td>100 (71%)</td>
</tr>
</tbody>
</table>

Figure 1 below illustrates the same results separated to correct and incorrect responses.

Figure 1 Correct and incorrect of the younger children

![Correct responses %](image1)

![Error analysis %](image2)

Each bar in figure 1 represents the percentage of each response to each stimulus. For example: pr>f means that the stimulus was present and the response future. Pa stands for past and ah for aan-het structures.
The first column in table 7 shows the stimulus (the questions presented by the experimenter) together with the number of items for each of them. The next three columns show the responses of the children; the last column shows the total of items that were answered for each stimulus category. The figures are the raw numbers with their percentages in brackets. The cells that represent the correct answers are bolded.

Except for two questions in the pre-test trials, all questions presented received an answer. Only in few cases did children change their minds after choosing an answer. There were no significant differences between the responses of the individual children.

The data presented in Table 7 and figure 1 reveal two clear findings: first, the children made significantly more errors when the stimulus is a 'gaan' structure (future interpretation) than in all other categories. They answered 68% of the 'gaan' questions incorrectly while they answered the present, past, and 'aan het' questions incorrectly only 37%, 36% and 29% of the time, respectively. (ANOVA of the correct responses: F=18.3, df=3, p=0.000, an LSD post-hoc test shows that the future category differs from each of the other three categories.)

Second, within the incorrect responses to the 'gaan' questions, the children chose the pictures that represented the present–ongoing event tense (148 out of 189 responses, or 78%, were incorrect; many more than with the past tense, where only 41 out of 189 responses, or 22%, were incorrect. (ANOVA of the incorrect responses: F=18.10, df=7, p=0.00, an LSD post-hoc test shows here as well that the future category differs from each of the other categories)

These two findings together support the prediction made in the previous section that Dutch-speaking children ages 3 to 4 optionally interpret sentences of the 'gaan+inf' structure as indicating an ongoing event counter to its obligatory future-inchoative interpretation required in the target grammar.

The older children performed significantly better than the younger group. However, even the older children had problems with the 'gaan'-structures and pointed to the correct picture in only 75% of their responses to 'gaan'-questions. A comparison of the responses to the future ('gaan') stimuli of the two age groups is presented in figure 2, below:
Figure 2 shows that the two age groups differ from one another in two respects. First the older children, although they did not perform 100% correctly, can be said to understand the inchoative-future meaning of the gaan-structures since they pointed to the correct picture 75% of the time. Secondly, looking at the two error types, future interpreted as present (henceforth: f>pr) and future interpreted as past (henceforth f>pa), we see a significant difference between the two age groups: while the younger children produced more f>pr errors than f>pa errors, (53% vs. 14%; t=7.74, df=54, p<0.05) the older children showed similar rates for the two errors (14% for f>pr, 11% for f>pa; t=0.711, df=34, p>0.05). This suggests that the older children who failed with this structure did not do so because they mistakenly judged gaan-structures to indicate the present tense, contrary to what we have concluded for the younger children.

A second difference between the two age groups lies in the responses of the individual subjects. While the younger children did not differ from each other in their responses, the older children did. This is demonstrated in figure 3, where the relative number of f>pr errors is shown for each subject.
Figure 3 shows that while younger children make similar numbers of f>pr errors, only three of the 19 older children are responsible for the majority of these errors in their group. A similar pattern is revealed in an item analysis comparing the f>pr errors that were made for each of the ten pictures presented with a future stimulus. This is presented in figure 4.

**Figure 4** Item analysis of the f>pr errors for the two age groups

We see here as well that for the younger children, each question-item received a similar numbers of errors, while for the older children, there seemed to be three pictures that were more misleading then the others, and consequently received higher error rates.

The subject and the item analyses above therefore contribute to the conclusion that, for the younger children, the interpretation of gaat-structures as present-tense (manifested by the f>pr error) is inherent and represents a genuine phenomenon, while for the older children such an interpretation is not characteristic and is, rather related to specific children (who might be ‘slower’ than their peers) and to specific items (which might be more misleading than others).

**Conclusion.**

The general conclusion of experiment 2, therefore, is that children misinterpret ‘gaan’ structures in their input and allow them to have a present tense reading as well as future-modal reading characteristic of adults’ speech. This misinterpretation represents a stage in child-Dutch and disappears in later stages. This conclusion supports the hypothesis made above and therefore supports the proposed analysis of the aux+inf phenomenon in child Dutch.
5. General Discussion:

Based on the evidence presented in this chapter, the following analysis is proposed: Dutch-speaking children misinterpret the gaan structures in their input as indicating present-ongoing events. The children are, at this point, therefore in virtually the same situation discussed previously, which is the locus of investigation of this dissertation: they find themselves facing two structures differing in syntactic representation but apparently similar in their interpretation.

The economy-based approach proposed in this dissertation predicts that in such situations the child will prefer to produce the structure that requires fewer movement operations, since it is more economical. Recall that in the other cases of optionality discussed previously, the two options the child faced were different only in word order; one option reflected the base order and the other an order derived by movement.

The case discussed in this chapter seems to be somewhat different, since the two structures the child faces here are not equal with respect to their elements; one of them includes an extra auxiliary. If we assume that this auxiliary was selected from the lexicon in the numeration process, then the two structures are not competitors with respect to economy principles, just as “a man is in the garden” and “there is a man in the garden” are not competitors and are both allowed in English.

In order to view these structures as competitors, I shall adopt Hollebrandse and Roeper’s (1996) claim that the aux + inf structures are not the result of insertion of an auxiliary from the lexicon but rather the result of the realization of finiteness features. In this way the current phenomenon becomes similar to the other cases of optionality: the two structures are equal with respect to their elements only in that in one of them the finiteness feature is realized through a dummy element and in the other it is realized through the lexical verb. Based on this analysis, we can include the phenomenon of aux + inf under the general rule of Merge over Move (Chomsky 1995) and justify the claim that the aux + inf (Merge) structure is more economical than the V2 (Move) structure in the matrix clause, while in the embedded clause the Merge structure is less economical than the base-generated structure.

The aux + inf structures, which appear in child Dutch, thus, are relevant to our discussion of the acquisition of “optional” movement operations. The data reported in this chapter not only show a similar pattern of preference for the more
economical option, they also contribute two important points to our discussion: first, this phenomenon shows that the notion of “optionality” in the input, which at first seemed to be a rather marginal phenomenon, is in fact more central to language acquisition. We have seen that children, as a result of misanalysis of input items, bring themselves into situations of “optionality” that are uncharacteristic of the target grammar. A second contribution this chapter makes to the general discussion is the strengthening of the economy-based approach. The fact that children are shown to prefer the aux+inf structures in matrix clauses but to disfavor them in embedded clauses indicates that the mechanism used to make the comparison is indeed similar to the computational notion of economy of derivation rather than to some other notion of simplicity or “canonisity”. It further shows that the role the input plays in acquisition is limited, as both for the doet and the gaat structures aux+inf is also allowed in embedded clauses in the input, a fact that children ignore in their acquisition of the target grammar.