Language development in children with psychiatric impairment.
Blankenstijn, C.; Scheper, A.R.

Citation for published version (APA):

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6 The ability to realize correct lexical categories: prepositions, adverbials and word order

Annette Scheper

6.1 Introduction
As stated in Chapter 5, PI-children frequently leave lexical categories implicit compared to N-children: they have too many missing lexical verbs, obligatory subjects and direct objects, prepositions and adverbial phrases of place, of time and of other types, especially of manner. There is striking evidence that the restricted ability to fill lexical categories in PI-children contributes substantially to the ungrammaticality described in Chapter 4. The kind of ungrammaticality caused by an error in the realization of a lexical category is the core issue of this chapter. The production of an error has a different impact on the understanding of the message than the occurrence of an empty lexical category (Chapter 5), although we might expect that word order errors have a greater negative impact on intelligibility than, for example, errors in the use of adverbials.

The main goal of this chapter is to examine whether PI-children show a normal ability with respect to the realization of correctly formed lexical categories. With a grammatical error we mean incorrect use of a lexical element in the T-unit. In this chapter we will investigate whether errors with respect to lexical categories exist and how they can be characterized. First, the use of prepositions in prepositional phrases is analysed (6.2). Second, the use of spatial, temporal and other adverbial expressions is investigated (6.3). Finally, the order of words is considered to be related to the placement of nouns, verbs or adjuncts (6.4). Finally, this chapter ends with a general conclusion with regard to errors in lexical categories (6.5).

6.2 Errors in the lexical choice of Prepositions

6.2.1 Research questions, definitions and operationalisations
As stated in 5.6.1, prepositions are essentially relational elements, connecting verbs to the argument or adjunct nominals associated with prepositions within the T-unit (Haegeman, 1991). Prepositional phrases (PP's) provide information as to the place, time or manner of the event expressed in the sentence. In this section we are not interested as to whether errors are made with respect to the realization of place, time and manner (see next section 6.3), but only in semantic errors in the choice of an obligatory preposition within a realized PP, named preposition selection errors. These errors reflect morphological/ syntactic impairments, since in Dutch the selection of correct prepositions is strongly restricted by the meaning of the verb. The verb frame that has to be stored in the lexicon additionally contains a specific selection of prepositions. We want to determine whether PI-children produce more preposition selection errors in their interviews than N-children. And, is there a comparable development with age?
In order to determine the rate at which selection errors with prepositions are made, the total number of Prepositional Phrases within 50 T-units are selected with a preposition in first position mostly followed by a noun phrase (Van Zonneveld, 1994; Haeseryn et al., 1997:915). In order to judge the semantically correct use of the preposition, often information of the preceding or next T-unit(s) had to be consulted. In a T-unit more than one prepositional phrase can occur, so more than one prepositional selection error per T-unit is possible. Example 1 shows a preposition error in a PP that marks an adverbial relation of place between an event and the subject.

**Example 1** Preposition selection error in a PP, which marks an adverbial relation of place between the event ‘zitten’ (to sit) and the subject in Dutch (PI-child; age 6:5)

**Interviewer:** wat doen ze [de muizen] dan?
(what-do-they [mice]-then?)

**Leander:** en eerst in de avond (eh toe) toen zat mijn muis met dat molentje.

**Paraphrase:** en s'avonds zat mijn muis <in> dat molentje.
(and in the evening my mouse sat in that little wheel).

**Leander:** (ging die) sprong die uit de boog [molentje].
(went he) jumped-he-out-of-the-wheel.

Example 1 illustrates the choice of the wrong preposition to express the relation of 'zitten' (to sit) with an agent 'mijn muis' (my mouse) in a certain place 'in een molentje' (in a little wheel). The correct preposition is deduced from the following context in which the mouse has to be *in* the wheel to be able to jump *out* of the wheel. In the analysis with respect to the preposition selection errors PI-children of four, six and eight year old are compared with N-children in the same age-groups.

### 6.2.2 Results: Preposition Selection Errors

As we have seen in 5.6.2, the numbers of prepositional phrases (PP) in the PI-children was the same compared to the N-children. It was therefore not necessary to use the PP's as covariate in the preposition selection error analysis.

In Table 6.1, the upper part of the Table shows the mean total number of selected PP's used in this analysis, whereas the lower part also shows the number of preposition selection errors within a PP in both groups. The results demonstrate that PI-children show significantly more errors in the correct use of prepositions within a PP than the N-children (F(1,99)=13.777; p<.0001).

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1 ANOVA with total number of Realized prepositional phrases as dependent variable and age (4-6-8yrs) as independent variable is used in the N- and PI-children.

2 ANOVA with total number of Preposition errors as dependent variable and age (4-6-8yrs) as independent variable is used in the N- and PI-children. No significant age or group*age interaction effect was observed.
Table 6.1  
Mean total number and standard deviation realized prepositional phrases in 50 T-units and mean total number, percentage (related to 50 T-units) and standard deviations of preposition errors in 45 N-children and 60 PI-children in the conversational genre

<table>
<thead>
<tr>
<th>Preposition errors</th>
<th>N-children (n=45)</th>
<th>PI-children (n=60)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>x</td>
<td>%</td>
</tr>
<tr>
<td>Realized PP's</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 yrs</td>
<td>16.06</td>
<td>-</td>
</tr>
<tr>
<td>6 yrs</td>
<td>18.00</td>
<td>-</td>
</tr>
<tr>
<td>8 yrs</td>
<td>18.33</td>
<td>-</td>
</tr>
<tr>
<td>Total mean</td>
<td>17.47</td>
<td>-</td>
</tr>
<tr>
<td>Preposition errors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 yrs</td>
<td>0.67</td>
<td>4%</td>
</tr>
<tr>
<td>6 yrs</td>
<td>0.93</td>
<td>5%</td>
</tr>
<tr>
<td>8 yrs</td>
<td>0.60</td>
<td>3%</td>
</tr>
<tr>
<td>Total mean</td>
<td>1.63</td>
<td>4%</td>
</tr>
</tbody>
</table>

Figure 6.1 shows the development with age in the N- and the PI-children. The number of preposition errors does not substantially decrease from the youngest N- and PI-children to the oldest N- and PI-children: both groups of children show almost comparable paths.

Figure 6.1  
Development with age of preposition selection errors (related to mean total number of realized prepositional phrases) in 45 N-children and 60 PI-children in the conversational genre
6.2.3 Conclusion: Preposition Selection Errors

The results confirm a problem in PI-children with the realization of the correct preposition within a realized PP. PI-children do have the ability to realize PP's, but they make significantly more preposition selection errors within these PP's than N-children. The preposition selection errors confirm that the PI-children have difficulties in expressing proper relations between the verbal predicate and the argument or adjunct nominals associated with the preposition. The PI-children not only have problems in realizing prepositions (see 5.6.2), but also in selecting the right one in relation to the verb frame.

6.3 Errors in the lexical choice of Adverbial phrases

6.3.1 Research questions, definitions and operationalisations

The semantic notions space and time are fundamental categories of orientation in the world, as we emphasized in 5.7, and can be morphologically/syntactically expressed (e.g. Hickmann, 2003). From the early age of two years children use adverbials in Dutch (Bol and Kuiken, 1988). Around the age of three children can combine two adverbials in a single clause in addition to the verb and its arguments (Verhulst-Schlichting, 1987). Children first have to learn to provide spatial and temporal information inside the clause frame before they can use more integrated spatial and temporal information between clauses.

Initially, normally developing children make overextension errors in the production of adverbials, especially in the adverbials of place and time (Schaerlaekens and Gillis, 1987). Overextension means that children go beyond the boundaries of a concept and therefore overextend the meaning of it. For example, young children first use the adverbial 'gisteren' (yesterday) universally for referring to any time moment except the real time 'nu' (now). Gradually, children have to learn the correct semantic use of different type of adverbials (Gillis and Schaerlaekens, 2000). From the developmental literature, we know that Dutch-speaking four-year-olds can use only few obligatory adverbials, mostly of the type of place and sometimes of the type of time. It is assumed that when children become able to express more complex meanings, they have to diversify their use of obligatory adverbials (Gillis and De Houwer, 1998).

We want to examine whether PI-children make more form errors in adverbials or adverbial phrases of place, time or other types compared to their age-matched N-children. We also want to determine whether the P and the N-children show a comparable development with age. In order to determine the rate at which adverbial errors that contribute to ungrammaticality occurred, four different types of adverbial errors were counted, also specified according to the type of adverbials or adverbial phrases that was erroneously used, such as place, time or other types (manner, degree, negation etc.) (Haeseryn et al., 1997:905; see also 5.7).
The ability to realize correct lexical categories

The four different types of adverbial errors that cause ungrammaticality are shown in Table 6.2.

Table 6.2  Different types of adverbial errors

<table>
<thead>
<tr>
<th>Types of adverbial errors</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) adverbials that contradict each other in meaning</td>
<td></td>
</tr>
<tr>
<td>(2) redundant adverbials within one type</td>
<td></td>
</tr>
<tr>
<td>(3) erroneous word selection in adverbial phrase</td>
<td></td>
</tr>
<tr>
<td>(4) semantically conflicting selection error of the adverbial of time related to the correct tense expressed by the verbal predicate (e.g. ‘toen gaat hij weg’ (then he goes away))</td>
<td></td>
</tr>
</tbody>
</table>

Only error type (4) occurs exclusively in adverbials of time, whereas error type (1) to (3) may occur in the three different adverbial types, such as of place, time and other. Each type of error will be explained in more detail below, illustrated by some examples. However, simple examples were difficult to find, as often these types of adverbial errors – that were also identified based on intonation cues – do not occur independently, but mostly within a cluster of language errors, not only related to semantic/pragmatic difficulties, but also to other morphological/syntactic problems.

First, the use of two adverbial phrases of the same type (time, place or other) that contradict each other semantically within the same T-unit were coded as an adverbial error, so that the T-unit was judged as ungrammatical in Dutch (Example 2 and 3).

Example 2  Contradicting adverbials of time (PI-child; age 6;0)

Richard:  en nu strakjes dat het avond is, dan gaan wij naar de tuin.
Paraphrasis: (and now in a moment when the evening comes, we will go to the garden)

In Example 2, ‘nu’ (now) and ‘strakjes’ (in a moment) are conflicting adverbials of time with respect to the starting point of the event the child wants to express. This makes the T-unit ungrammatical.

Example 3  Contradicting adverbials of degree (PI-child; age 8;3)

Jeffrey:  dus dat was een beetje heel zielig.
Paraphrasis: (so that was a little bit very sad).

In Example 3, ‘een beetje’ (a little bit) and ‘heel’ (very) are conflicting adverbials of degree with respect to the intensity of the event the child wants to express. This makes the T-unit ungrammatical.

The ability to realize correct lexical categories
In Example 3, the adverbials 'een beetje' (a little bit) and 'heel' (very) are contradictory. Although this example also shows a problem of evaluating the proper degree of an event, the conflicting semantic information not only negatively influences the understanding of the listener, but also makes the T-unit not well-formed in Dutch.

Second, the use of two redundant adverbial phrases of one type (time, place or other) in the same T-unit were coded as an adverbial error, causing that the T-unit can be judged as ill-formed in Dutch (Example 4).

Example 4  
Redundant adverbials of place (PI-child: age 6;5)

Interviewer:  oh en wat doet ze [moeder] dan met de kom [vissenkom]?
Mere1:  nou die gaat ze wassen.
Mere1:  (well she starts to wash it).
Mere1→  #1 en dan (eh) doet ze *der* ander water *in* en *der* weer takjes *erin* doen, waar ze van ook kunnen eten.
         and-then-does-shethere-different-water-in-and-therereagain-twigs-therein-done-
         which-theyalso-can-eat.
Paraphrasis:  (and then she puts different water in and again twigs in which they also can eat).

Example 4 shows too many, redundant adverbials of place 'der..in' (there..in) and 'der..erin' (there..therein): when two successively expressed adverbials have the same meaning, the last one is redundant. The place is already clear from the main clause, so the explicit markers of the place in the reduced clause is a burden of information that not only confuses the listener, but also causes the T-unit to be ill-formed.

Third, erroneous word selection in adverbial phrase of one type (time, place or other) was coded as an adverbial error, causing the T-unit to be judged ungrammatical in Dutch (Example 5).

3 Note that conjunction reduction constructions as in Example 3 are considered as one T-unit, according to STAP (Van den Dungen and Verbeek, 1994, 1999).
Example 5  Erroneous word selection in adverbial of time (PI-child; age 6.3)

Robert:  
Paraphrasis: 

*teacher-get-a-baby-for*(eh)*another time*.  

In Example 5, the combination of the preposition, the adjective and the noun in the adverbial phrase of time is not only semantically inappropriate, but – more importantly here – is grammatically incorrect, since 'een ander keer' (for another time) should have been 'een andere keer'.

Fourth, a selection error in the adverbial of time as related to the tense expressed by the verbal predicate was coded as an adverbial error, causing that T-unit to be judged as ungrammatical (Example 6).

Example 6  Semantically conflicting selection error of adverbial of time (PI-child; age 6.5)

Leander:  
Paraphrasis: 

In Example 6, the adverbial of time 'dan' (then; present tense) is incorrectly used (instead of the adverbial 'toen' (then; past tense)) in combination with the correctly used past tense of the verbal predicate 'gingen' (went).

6.3.2 Results: Adverbial Errors

From Table 6.3, we see that the PI-children make significantly more adverbial errors than the N-children (F(1,99)=3.934; p<.050). However, also a significant group*age interaction effect is found (F(2,99)=5.167; p<.007), indicating that the developmental change with age is different in the P-group compared to the N-group. The significant interaction effect motivates a post-hoc analysis using one-way ANOVA.

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4 The use of the past tense was judged as correct, since the preceding and following T-units all were expressed in the past tense.

5 ANOVA with total number of Adverbial errors as dependent variable and age (4-6-8yrs) as independent variable is used in the N- and PI-children.

6 A one-way ANOVA/ANCOVA is used to examine the linearity of the age effects in both groups. A linear age effect indicates the influence of development.
Table 6.3  

Mean total number, percentage (related to 50 T-units) and standard deviation of adverbial errors in general in 45 N-children and 60 PI-children in the conversational genre.

<table>
<thead>
<tr>
<th>Adverbial errors</th>
<th>N-children n=45</th>
<th>PI-children n=60</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>x</td>
<td>%</td>
</tr>
<tr>
<td>4 yrs</td>
<td>0.93</td>
<td>4%</td>
</tr>
<tr>
<td>6 yrs</td>
<td>0.53</td>
<td>1%</td>
</tr>
<tr>
<td>8 yrs</td>
<td>1.33</td>
<td>3%</td>
</tr>
</tbody>
</table>

Total mean 1.27 3% 1.70

From Figure 6.2, it is clear that in both populations - unexpectedly - no linear age-developments with regard to adverbial errors were found, but quadratic developments reflecting a turned U-curve in the N-children and a U-curve in the PI-children.

Figure 6.2  

Development with age of the production of adverbial errors (related to 50 T-units) in 45 N-children and 60 PI-children in the conversational genre.

These results are mainly caused by the eight-year-old N-children that unexpectedly behave relatively worse than the six-year-old N-children, whereas the four-year-old PI-children make relatively few adverbial errors, mainly due to the relatively low production of adverbials compared to the same aged N-children. Thus, the chance to find errors is relatively reduced in the four-year-old PI-children.

When we differentiate between the adverbial errors related to different types of adverbials, Table 6.4 shows that in both populations comparably adverbials of other

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7 One-way ANOVA with total number of Adverbial errors as dependent variable and age (4-6-8yrs) as independent variable is used in the N-children. One-way ANOVA with total number of Adverbial errors as dependent variable and age (4-6-8yrs) as independent variable is used in the PI-children.
types are the most difficult to use morphologically/syntactically appropriately, followed by adverbials of time and place.

Although PI-children produced as many *adverbial errors of place*\(^8\) as the N-children, the PI-children produced significantly more *adverbial errors of other types* \((F(1,98)=6.647; p<.011)\)\(^9\) than the N-children. Surprisingly, the PI-children showed significantly fewer problems with the correct use of *adverbials of time* than the N-children \((F(1,98)=3.626; p<.030)\)\(^10\). However, the PI-children use very few different adverbials of time and they do not show the ability to vary the use of certain forms.

### Table 6.4

<table>
<thead>
<tr>
<th>Different adverbial error</th>
<th>N-children (n=45)</th>
<th>PI-children (n=60)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adverbial errors of place</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4yrs</td>
<td>0.00 0%</td>
<td>0.25 16% 0.64</td>
</tr>
<tr>
<td>6yrs</td>
<td>0.00 0%</td>
<td>0.20 7% 0.41</td>
</tr>
<tr>
<td>8yrs</td>
<td>0.13 10% 0.52</td>
<td>0.05 3% 0.22</td>
</tr>
<tr>
<td>Total mean</td>
<td>0.04 3% 0.30</td>
<td>0.15 9% 0.42</td>
</tr>
<tr>
<td>Adverbial errors of time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4yrs</td>
<td>0.93 48% 1.44</td>
<td>0.50 32% 0.76</td>
</tr>
<tr>
<td>6yrs</td>
<td>0.13 25% 0.35</td>
<td>0.45 16% 0.69</td>
</tr>
<tr>
<td>8yrs</td>
<td>0.67 50% 0.72</td>
<td>0.15 10% 0.49</td>
</tr>
<tr>
<td>Total mean</td>
<td>0.58 41% 0.98</td>
<td>0.37 19% 0.66</td>
</tr>
</tbody>
</table>

From Figure 6.3, we see that adverbial errors of time linear decrease in the P-population \((F(2,98)=3.626; p<.030; \text{Eta squared .06; R squared .05})\)\(^{11}\) in contrast to

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8 ANCOVA with adverbial errors of place as dependent variable, total number of adverbial errors as covariate and age (4-6-8yrs) as independent variable is used in the N- and PI-children. The total number of adverbial errors differs significantly in both populations, so this variable is used as covariate. The group*age interaction effect is insignificant.

9 ANCOVA with adverbial errors of other types as dependent variable, total number of adverbial errors as covariate and age (4-6-8yrs) as independent variable is used in the N- and PI-children. The group*age interaction effect is insignificant.

10 ANCOVA with adverbial errors of time as dependent variable, total number of adverbial errors as covariate and age (4-6-8yrs) as independent variable is used in the N- and PI-children. There is an insignificant group*age interaction effect.

11 One-way ANOVA with Adverbial errors of time as dependent variable, total number of Adverbial errors as covariate and age (4-6-8yrs) as independent variable is used in the N-children. Oneway ANOVA with Adverbial errors of time as dependent variable, total number of Adverbial errors as covariate and age (4-6-8yrs) as independent variable is used in the PI-children.
the N-population. In order to explain this result, we use the same argument as above: N-children seem to be experimenting more with different forms of adverbials of time and make therefore more errors in comparison with PI-children who have a less differentiated use of temporal expressions.

Figure 6.3  

*Development with age of adverbial errors of time (related to the total number of adverbial errors in general)* in 45 N-children and 60 PI-children in the conversational genre.

From Figure 6.4, we see that, unexpectedly, PI-children show a linear increase with age of adverbial errors of other types (F(2,98)=3.515; p<.034; Eta squared .13; R squared .02) in contrast to the N-children who improve after six years of age. Since we are interested in clusters of morphological/syntactic errors (see 4.3), we checked whether adverbial errors of place co-occurred with adverbial errors of time and of other types, etc. We observed that in the PI-children adverbial errors of time significantly co-occur with adverbial errors of other types (r=-.277; p<.016) comparable to the N-children (r=-.283; p<.030) (see Appendix 6a). These results suggest that there seems to be a developmental order: adverbials of time seem to be acquired before adverbials of other types, since errors in adverbials of time seem to predict adverbial errors of other types.

12 One-way ANOVA with Adverbial errors of other types as dependent variable, total number of Adverbial errors as covariate and age (4-6-8yrs) as independent variable is used in the N-children. One-way ANOVA with Adverbial errors of other type as dependent variable, total number of Adverbial errors as covariate and age (4-6-8yrs) as independent variable is used in the PI-children.

13 Pearson's product-moment-correlation (pmc) coefficient is used with variables percentage errors of place, time and other type (related to the total number of adverbial errors) in the interview of 50 T-units in 60 PI-children of four, six and eight-year-old. Correlation is significant at the .05 level (1-tailed).

14 Pearson's pmc coefficient is used with variables percentage errors of place, time and other type (related to the total number of adverbial errors) in an interview of 50 T-units in 45 N-children of four, six and eight year old. Correlation is significant at the .05 level (1-tailed).
6.3.3 Conclusion: Adverbial Errors

Overall, the PI-children as a group produce significantly more adverbial errors than N-children, contributing to the ungrammaticality (see 4.2 and 4.3). PI-children produce more redundant adverbial phrases that have the same semantic content; these influence the intelligibility of informational exchange in the interview negatively. As a consequence, using too many adverbial phrases indicates focussing on optional information, rather than focussing on the kernel of the sentence, that is the verbal predicate and its arguments.

Since the development with age with respect to the production of adverbials errors show rather diverse patterns, we might assume that there is great individual variation within the N- and the PI-children due to a relatively high degree of optionality of adverbial phrases.

However, a limited adverbial lexicon in the PI-children decreases the chance to observe adverbial errors. This may be an explanation for the non-linear age effects observed. Nevertheless, the results showed that adverbials of place are the least problematic, whereas adverbial errors of time often co-occur with adverbial errors of another type in the PI-children comparably to the N-children. These results suggest a developmental order of complexity, although it still is an issue of future research whether Dutch-speaking children acquire the correct use of adverbials of place before the correct use of adverbials of time and adverbials of other types.
Chapter 6 Morphological/Syntactic conversational development

6.4 Errors in Word Order

6.4.1 Research questions, definitions and operationalisations
Word order in a language is closely related to the typological properties of that language. Languages are classified according to a basic word order with the most important constituents of a sentence, namely the Subject (S), the Verb (V) and the Object (O). Linguistic theories describe word order as the result of movement of these lexical categories to their functional positions. For example, the position determines the morphological/syntactic function of a lexical category. It is also a standard observation in the acquisitional literature, that in languages where word order is fairly fixed, children rapidly use this word order with very few errors. This was first noticed by Brown (1973) and by many other researchers since. For languages where word order is more flexible, there are differing reports. Children can first systematically use non-dominant SOV order before switching to the proper SVO order and vice versa (e.g. Slobin, 1982; Mills, 1985; Hickey, 1990). Undoubtedly, it seems that there is variation cross-linguistically.

Dutch constituent order in main clauses is quite variable. Constituent order is linked to the type of clause (main versus subordinate clause), mood (declarative versus interrogative) and topicalization processes (De Houwer and Gillis, 1998). Declarative main clauses in Dutch exhibit SVO word order and declarative subordinate clauses have SOV order. From the perspective of generative grammar, the latter is seen as the underlying order, meaning that for Dutch the verb phrase is in final position (Koster, 1975). In subordinate clauses, the constituent order is less variable than in main clauses: the relative order of Subject, Object and Verb is nearly always the same, namely SOV. In main clauses the finite verb occurs in second position, as Dutch is a Verb Second language (Haegeman, 1991). The subject is often in first position, although topicalization of a constituent such as an object or an adverbial replaces the subject after the finite verb, i.e. subject-verb inversion (see this chapter). The place of the object is the most variable of the three: in first position, after the inverted subject or after the finite verb (Koster, 1975). Adjuncts, like adverbial phrases, are structure-neutral constituents that can be placed variably in first position or after the finite verb or object (Van Zonneveld, 1994) (6.3).

In early two-word sentences, primary grammatical relations are already ordered in an adult-like way, such as subject-predicate or head-complement, although their morphological realization is still underspecified. The expression of these grammatical relations through word order mostly precedes the development of marking specific morphological distinctions between grammatical relations (Van Kampen and Wijnen, 2000). During the early stages of acquisition the verb in infinitival form is in final position. Children have to learn that the verb must move into the second position of the sentence and be finite. At this point in the acquisition order problems can appear in verb second languages (Haegeman, 1991). The period during which children seem to freely alternate finite and non-finite lexical verbs is called the 'Optional Infinitive' (OI) stage (Poeppel and Wexler, 1993; Wexler, 1994). The finite and non-finite verbs appear with a different word order: sentence-second position and sentence-final, respectively. Wexler claims that in this stage tense is
The ability to realize correct lexical categories

underspecified. In Dutch, for example, this period may last until approximately the age of 3:6 (Wijnen and Bol, 1993). SLI-children will need more time to escape from the OI stage and even have an 'Extended Optional Infinitive' (EOI) stage that is characterized by the predominance of verb forms that are not feature-marked (Rice, Wexler and Cleave, 1995). During this stage SLI-children do not regard the marking of finiteness on the verb as obligatory and show significantly more difficulties in establishing proper word order than their normally developing same-aged peers. Even after the acquisition of the placement of the finite verb, children with SLI still show word order errors independent of incorrect verb morphology (Leonard, 2002). Thus, normally developing Dutch children have to acquire the proper rules for the order of the constituents in their specific language. In this section, therefore, we want to examine whether the PI-children show more word order errors compared to the age-matched N-children and whether there is a comparable development with age.

We define word order errors as any problem with the word order pattern of a T-unit, concerning mostly nouns, verbs or adverbials, following STAP (Van den Dungen and Verbeek, 1994:46, 1999; Haeseryn et al., 1997:1225). Although an error of this kind often results in changing the position of more than one constituent in a T-unit, this is counted as a single word order error per T-unit. Word order errors concern mostly difficulties related to specific inversion rules, for example in topicalized T-units, but also concern difficulties related to the verb-second rule. It is not quite clear at what point in development Dutch-speaking children start to use fronted constituents in sentence-first position in clauses that clearly contain a finite verb and a subject (Wijnen and Verrips, 1998). By the time children are three years old, they seem to be using a fair number of clauses with a subject and a finite verb in which there is a fronted constituent (e.g. Verhulst-Schlichting, 1985; De Houwer, 1990). Since Dutch is a verb-second language, the fronted element should be followed by a verbal element in second position. If an object or an adverbial is topicalized, these main clauses usually show appropriate adult-like inversion, in which the subject is moved to post verbal position. In this type of topicalization the same movement can be observed as in question inversion, namely postverbal movement of the subject. Although question inversion, both yes/no questions and WH questions where the interrogative pronoun is not the subject, seems to be acquired by the age of three years (e.g. Haegeman, 1991), other types of inversion seem to be still in development. Thus, in the development of Dutch word order in N-children, we might expect word order errors (Example 7) and even more so in the PI-children.

Example 7  Subject-verb inversion error (PI-child; age 4:5)

| Bas:        | dan we doen verstoppertje spelen.  
|            | then we do hide-and-seeking. |
|            | (then we are hiding) |
| Paraphrase: | dan <gaan we> verstoppertje spelen.  
|            | then go <we > hide-and-seeking. |
|            | (then we play hide-and-seek) |
Example 7 shows an error in the word order in the form of a non-inverted subject. If a fronted element, like the adverbial of time 'dan' (then; present tense) is used in sentence-first position, consequently the second position of a sentence must be filled with a verbal element (Haegeman, 1991) and the subject 'we' (we) should have been moved to postverbal position.

Example 8 shows the incorrect placement of an auxiliary verb that should be in second position.

**Example 8**

**Interviewer:** en wat nemen jullie dan allemaal mee?

**Paraphrasis:** Verbal order error: no verb second (PI-child; age 4;8). Topic of the conversation is staying with Marco's grandfather and grandmother.

**Interviewer:** en wat nemen jullie dan allemaal mee?

**Marco:** (eh) ik nam vroeger altijd speelgoed mee.

**Paraphrasis:** (I always took toys with me before)

**Marco:** maar ik had.

**Paraphrasis:** (but I had)

**Marco:** maar ik met de computer ga spelen.

**Paraphrasis:** (but I play with the computer)

In Example 8, the coordinate conjunction 'maar' (but) connects a T-unit with the previous one (see also 13.3). So the conjunction is not part of the syntactic scope of the T-unit. In this example, the conjunction 'maar' (but) is followed by a subject in first position, but the expected finite verbal element in second position is not realized. The auxiliary 'ga' (go) is placed in prefinal position, which implies an error in word order for Dutch.

Another example of a wrong placement of verbal elements, although not related to verb-second, is shown in Example 9.

**Example 9**

**Gary:** die moet mama nog maken gaan.

**Paraphrasis:** (those have first to be made by mamma)

In Example 9, the two verbal parts 'maken' (to make) and 'gaan' (to go) are in wrong sentence position and should be reversed.

Finally, the placement of adverbials can be wrong, like in Example 10.
In Example 10, the adverbial of time 'vanavond' (tonight) is placed in the right position of the object instead of in the left position. These examples show typical word order errors in Dutch, although other types exist. Nevertheless, all different types of word order errors found in the data are included in our analysis. Contrary to the analysis of preposition and adverbial errors where we compared 60 PI-children with 45 N-children (Roelofs, 1998), with respect to the analysis of word order errors we compare 120 PI-children of all ages with 240 N-children from the STAP-population (Van den Dungen and Verbeek, 1994, 1999).

### 6.4.2 Results: Word Order Errors

First, from Table 6.5 we see that a significantly high number of PI-children \((p<.000)^{15}\) represent the marked category with a \(z\)-score equal or below minus 2 (first column), producing too many word order errors, as 62% of the PI-children show severe and 12% shows slight problems with word order. Overall, 74% of the PI-children show a real problem with word order.

<table>
<thead>
<tr>
<th>Word order errors</th>
<th>PI-children (n=120)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(z)-scores</td>
<td>(z \leq -2)</td>
</tr>
<tr>
<td>Normal distribution</td>
<td>23%</td>
</tr>
<tr>
<td>4 yrs</td>
<td>16  80%</td>
</tr>
<tr>
<td>5 yrs</td>
<td>11  55%</td>
</tr>
<tr>
<td>6 yrs</td>
<td>14  70%</td>
</tr>
<tr>
<td>7 yrs</td>
<td>9   45%</td>
</tr>
<tr>
<td>8 yrs</td>
<td>13  65%</td>
</tr>
<tr>
<td>9 yrs</td>
<td>11  55%</td>
</tr>
<tr>
<td>Total children%</td>
<td>74  62%</td>
</tr>
</tbody>
</table>

---

15 Binomial test was used in PI-children to measure the differentiation in severe problems \((z \leq -2\) and \(z > -2\)) and slight problems \((z < -1\) and \(z > -1\)) on the variable Word order error according to the STAP-values (Van den Dungen and Verbeek, 1994, 1999).
Second, from Table 6.6, we see that there is no clear age development in the number of word order errors in the PI-children\(^{16}\) comparable to the N-children.

**Table 6.6**  
Mean total number, percentage (related to 50 T-units) and standard deviations of word order errors in 240 N-children (STAP, 1994) and 120 PI-children in the conversational genre

<table>
<thead>
<tr>
<th>Word order errors</th>
<th>N-children n=240</th>
<th>PI-children n=120</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>x</td>
<td>%</td>
</tr>
<tr>
<td>4 yrs</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>5 yrs</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>6 yrs</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>7 yrs</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>8 yrs</td>
<td>1*</td>
<td>2%</td>
</tr>
<tr>
<td>9 yrs</td>
<td>1*</td>
<td>2%</td>
</tr>
<tr>
<td><strong>Total mean</strong></td>
<td>1</td>
<td>2%</td>
</tr>
</tbody>
</table>

*values extracted by extrapolation

Although it is suggested that the youngest N-children seem to have overcome the real problems with order of constituents in the syntactic frame, the PI-children seem to have problems with word order even in the oldest age groups (Figure 6.5). A more detailed study of the order problems showed that 25% of the order errors in PI-children were subject-verb inversion errors (see Example 7). Despite a fronted element, like an adverbial, the subject was not moved into postverbal position, but stayed in second position. These subject-verb inversion errors lead to ungrammaticality of the T-unit (see 4.2 and 6.4.1).

**Figure 6.5**  
Development with age of word order errors (related to 50 T-units) in 240 N-children and 120 PI-children in the conversational genre

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\(^{16}\)ANOVA with word order error as dependent variable and age (4-5-6-7-8-9yrs) as independent variable is used in the PI-children.
6.4.3 Conclusion: Word Order Errors
It is obvious from the results that the PI-children show significantly more problems with the order of constituents in a sentence than the N-children. Problems with word order are closely related to the typological properties of a language, especially verb second languages like Dutch (Haegeman, 1991). In Dutch SLI-children word order problems were not found (De Jong, 1999) as opposed to Swedish SLI (e.g. Hansson and Nettelbladt, 1995; Hansson and Nettelbladt, 2001). These Swedish SLI-children often maintain the subject-verb order in an obligatory context for inversion. Similar problems are found in the PI-children: they show too many order problems, especially with subject-verb inversion. Dutch PI-children differ from Dutch SLI-children relating to order problems. Thus, the fact that 74% of all the PI-children deviate significant from the norm, indicates that word order errors are one of the key problems that contribute to the ungrammaticality we already observed (see 4.2 and 4.3).

6.5 General conclusions: the ability to realize correct lexical categories
It is obvious from the results that PI-children show significantly more problems with the realization of the semantically correct lexical categories of all the different types measured than the N-children, resulting in morphologically/syntactically incorrect T-units (4.2). The PI-children not only make significant preposition selection errors and adverbial errors, but also significantly more word order errors (Table 6.7).

Table 6.7 An overview of errors in lexical categories: errors in lexical categories: preposition selection errors, adverbial errors (adverbials errors of place, of time and other types) and word order errors in the specific obligatory context for each category

<table>
<thead>
<tr>
<th>Errors lexical categories</th>
<th>N-children</th>
<th>PI-children</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n=45/240</td>
<td>n=60/120</td>
</tr>
<tr>
<td>Preposition selection errors</td>
<td>4%</td>
<td>10%</td>
</tr>
<tr>
<td>Adverbial errors</td>
<td>3%</td>
<td>4%</td>
</tr>
<tr>
<td>Place</td>
<td>0.1%</td>
<td>0.4%</td>
</tr>
<tr>
<td>Time</td>
<td>1.2%</td>
<td>0.8%</td>
</tr>
<tr>
<td>other types</td>
<td>1.7%</td>
<td>2.8%</td>
</tr>
<tr>
<td>Word order errors</td>
<td>2%</td>
<td>6%</td>
</tr>
</tbody>
</table>

These results indicate problems in the PI-children with expressing the proper semantic relations by means of a preposition between the predicate and the argument or adjunct nominals associated with prepositions within the T-unit. Similarly, they also have difficulties in producing correct expression of adverbials of manner, degree, negation, etc. that have a negative impact on the ability to explicate detailed information about actions and events (see 12.5).
Finally, the results suggest that word order errors are typical for PI-children compared to N-children, as opposed to Dutch SLI-children (De Jong, 1999), since threequarters of all 120 PI-children have problems in this area, reflecting greater difficulties in acquiring hierarchical grammatical relations even in the oldest age groups. These PI-children often seem to be incapable to escape from the preference for sequential grammatical relations.

To conclude, the analysis of errors in lexical categories confirms the presence of an uneven profile in PI-children (e.g. Leonard, 1996): the oldest nine-year-old PI-children resemble the youngest four-year-old N-children in making more errors in the selection of prepositions, adverbials and in word order. A subgroup of PI-children shows twice as many preposition selection and word order errors as the N-children, although we have not observed this for the adverbial errors (see Table 6.6).

Overall, PI-children show a delay in using grammatical rules for the realization of lexical categories compared to the N-children.