The acquisition of reference: a cross-linguistic study
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9 Discussion and conclusion

9.1 Introduction

This study has examined the acquisition of the morphosyntax and pragmatics of person and object reference in Dutch, English and French children. The input language has also been investigated. In the adult grammars of these languages, the choice of a referential expression depends on the cognitive status of the referent, that is, on the assumed representation of the referent in the speaker and hearer’s memory and the extent to which the referent is active in their memory (§1.1). Morphosyntactic forms, such as nouns with different types of determiners or pronouns, convey information about the assumed cognitive status of the referent. In turn, the cognitive status of a referent is related to pragmatic factors, three of which are investigated in this study (§2.3): (1) the distinction between non-specific/specific reference, (2) the distinction between new/given in discourse and (3) for referents that are new to discourse, the distinction between not familiar/familiar to the hearer on the basis of no mutual knowledge (nmk)/mutual knowledge (mk) and physical absence (end)/physical presence (exp). These three distinctions operate in seven pragmatic functions: non-specific reference, labelling, discourse-new-nmk, discourse-new-mk-exp, discourse-new-mk-end, discourse-given-maintenance and discourse-given-shift. In the adult grammar and input of Dutch, English and French, there are strong associations and disassociations between these pragmatic functions and the use of nouns with different types of determiners, pronouns and proper names (§2.4).

In the acquisition of reference, children are faced with a double task.
They not only have to learn the relevant morphosyntactic forms, but also the pragmatic conditions under which these forms can or must be used as referential expressions. The challenge for language acquisition research is to find out how these two aspects of reference interact in development. The main goal of this study was to examine when young children start to show sensitivity to the three pragmatic factors in their use of different types of determiners, pronouns and proper names and how this sensitivity develops (Research Question A, §3.5). This was investigated in three-monthly spontaneous speech samples of three Dutch, three English and four French children between 2;0 and 3;3. The input was also analyzed (§4.2).

Three issues were examined in order to shed more light on the development of the morphosyntax and pragmatics of reference. Firstly, the longitudinal design of this study made it possible to investigate the influence of cross-linguistic and within-language differences in the speed of acquisition of determiners on the acquisition of the pragmatics of reference (Research Question B §1.2.1, §3.5). Secondly, two possible types of influence from the input were investigated (Research Question C, §1.2.2, §3.5). Children may show early sensitivity to language-specific patterns of form-function associations. In addition, if children use their general cognitive capacities in language acquisition, the frequency and consistency of form-function combinations in the input may impact on the speed at which children reach the adult level of form-function use. Current theoretical models of language acquisition attribute different roles to the input. There is, however, hardly any research on the influence of input in the area of pragmatics. This study aimed to fill this gap. An early role of the input is most consistent with a constructivist or usage-based theory of language acquisition (Tomasello, 2003). Thirdly, the children’s sensitivity to the pragmatic factors of new/given in discourse and familiarity was assessed in their use of different types of determiners on the one hand and in their use of pronouns as opposed to nouns and proper names on the other hand. This approach made it possible to examine whether children’s sensitivity to these factors, and the moment at which they reach the adult level of form-function use, develops in parallel for determiners and pronouns or whether acquisition proceeds in a more piecemeal or form-by-form fashion (Research Question D, §1.2.3, §3.5). This issue is connected to the assumed role of the input and the validity of the constructivist/usage-based theory of language acquisition. There is evidence for the usage-based position if children acquire form-function combinations in a form-by-form fashion that
can be connected to input differences in frequency and consistency. There is
evidence against the usage-based position however, if there are differences in
input frequency and consistency, but at the same time, the children show across-
the-board sensitivity to a pragmatic factor and reach the adult level of form use
with respect to this factor in parallel for determiners and pronouns.

The answer to the last research question will be discussed in §9.5. I will,
however, first summarize the acquisition of the morphosyntactic forms for
reference and the use of pragmatic functions (§9.2). This information forms the
necessary background to subsequently discuss the answers to the four research
questions. The development of children’s sensitivity to the pragmatics of reference
in their use of determiners and (different types of) pronouns is summarized in
§9.3. Section 9.4 focuses on the influence of the input. In the last section (§9.6),
I will discuss the implications of this study for theories of language acquisition
and modularity and offer suggestions for further research.

9.2 Background on the acquisition of forms and functions
9.2.1 Acquisition of determiners and pronouns
It was necessary to first establish whether the subjects actually had acquired the
morphosyntactic forms under investigation (Chapter 5). First, the productive use
of different types of determiners, different types of pronouns and proper names
was established (§5.2). From 2;0 to 3;3, there are no large differences between
the children acquiring Dutch, English or French in the age at which they have
the morphosyntactic forms available for productive use (Table 9.1). The most
frequently occurring pronominal forms, namely personal and demonstrative
pronouns, are already used productively at 2;0 or shortly afterwards (§5.4.1). The
most frequently occurring determiner types, namely the indefinite, definite and
demonstrative determiner, are used productively before 2;6 (§5.3.1). This indicates
that the children have the opportunity to work on the associations between
morphosyntactic forms and pragmatic functions in language production from a
very early age, and in comprehension of course even earlier.

Table 9.1. Overview of age range of earliest productive use of pronouns, determiners and
proper names in child Dutch, English and French

<table>
<thead>
<tr>
<th>Forms</th>
<th>Dutch</th>
<th>English</th>
<th>French</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pronouns</td>
<td>2;0-2;6</td>
<td>2;0-2;3</td>
<td>2;0-2;3</td>
</tr>
<tr>
<td>Determiners</td>
<td>2;0-2;6</td>
<td>2;0-2;6</td>
<td>2;0-2;6</td>
</tr>
<tr>
<td>Proper names</td>
<td>2;0</td>
<td>2;0</td>
<td>2;0</td>
</tr>
</tbody>
</table>
Since there were no differences in productive use, this variable could not be used to study the influence of the speed of morphosyntactic acquisition on the children’s sensitivity to the pragmatics of reference. There were, however, differences in the use of morphosyntactic forms in obligatory grammatical contexts. Pronouns cannot be easily analyzed for this, but determiners can (§5.2, §5.3.2). The 90-percent-criterion (Brown, 1973) is reached in French between 2;6 and 2;9, in English between 3;0 and 3;3 and in Dutch after 3;3 (Figure 9.1, repeated from §5.3.2.4). These results confirm previous findings on the Romance-Germanic difference in determiner acquisition (cf. Chiercha et al., 2001). However, a difference between Dutch and English, that is, within Germanic languages, has not been reported before. It is important to note that the differences found here are not due to any of the subjects per language being extremely delayed or advanced in their overall linguistic level. On the basis of $mlu_w$, these children’s language levels are comparable to norm groups of children acquiring the same language (§4.2 and Appendix A).

Figure 9.1. Cross-linguistic comparison of the percentage of use of determiners and fillers in obligatory morphosyntactic contexts per age point in child Dutch, English and French

The differences in determiner development seem to be clearly related to the frequency of determiners in the input of the languages studied. Bare nouns are scarcely attested in the French input, whereas they are more frequent in the
Dutch than in the English input (§2.2.1 and §5.3.2.4). French children thus have a strong cue in the input about the necessity of an element that must precede nouns. In English and Dutch, this cue is less strong, and this seems to affect the speed of determiner development. The role of the input confirms earlier findings from Kupisch (2004) and extends this result to differences between Germanic languages. However, input may not be the only factor that is relevant to explain cross-linguistic differences in determiner acquisition. It is possible that the preferred metrical template and other morphological properties of the target language, as suggested by Llèo (2001) and Kupisch (2006a) respectively, also contribute. The cross-linguistic differences in determiner acquisition, but also within-language differences between the children studied, have been used to investigate the role of the speed of morphosyntactic acquisition on the development of the pragmatics of reference (Research Question B, §3.5).

On theoretical grounds, some researchers have proposed that children’s determiner omission can be explained by pragmatic factors (§7.4.1). For example, children may associate ungrammatical bare nouns with givenness in discourse, just as they do for dropped subjects and objects. This would lead to the use of ungrammatical bare nouns for discourse-given referents. Alternatively, children may use ungrammatical bare nouns mainly for non-specific reference or labelling. The empirical results from this study indicate that there is no relation between the children’s use of ungrammatical bare nouns and any of the pragmatic factors proposed in the literature (§7.4.1). Other factors, for example metrical template, are more likely candidates for explaining determiner omission.

9.2.2 Frequency of pragmatic functions of reference
In order to investigate form-function associations, it was necessary to establish whether the children and adults in fact use the pragmatic functions studied in the data (Chapter 6). From 2;0 onwards, all pragmatic functions are present in discourse between children and adults, but their frequency differs (§6.5). Over all age points, both the children and the adults most frequently use the pragmatic function of discourse-given-shift. There are also ample occurrences of discourse-given-maintenance, labelling, discourse-new-mk-exp and non-specific reference. Two of the pragmatic functions are infrequent.

References to entities that are not physically present (discourse-new-mk-end) do not occur very frequently, since discourse topics in conversations with young children revolve around the here-and-now (e.g. Ninio & Snow, 1996). A new
finding is that the frequency of references to entities that are not mutually known to the speaker and the hearer (discourse-new-nmk) is very low in the children’s speech over all age points (less than 5 percent of all referential expressions) and almost zero in the input. Conversations between familiar adults and children are apparently not conducive to the use of this pragmatic function, since the conversation participants have too much shared experience. Conversations with interlocutors with less shared experience might create a situation in which the child gets more evidence on how to refer to not mutually known referents: if breakdowns occur, the child has the opportunity to realize that form use was not appropriate (cf. Tomasello, Conti-Ramsden & Ewert, 1990). For these two infrequent pragmatic functions, the data in this study had to be pooled over age points to investigate the use of morphosyntactic forms.

9.3 The interaction of morphosyntax and pragmatics in the acquisition of reference

9.3.1 Associating determiners and pragmatics

In the adult grammars of Dutch, English and French, there are strong associations and disassociations between the use of nouns with different types of determiners and the pragmatic functions that are related to the pragmatics factors of specificity, givenness in discourse and familiarity of discourse-new referents on the basis of mk/nmk (§2.4). Important questions in this respect are when children start to show sensitivity to these pragmatic aspects of reference and what influence the acquisition of the morphosyntax has on this development (Research Questions A and B, §3.5). The analysis in Chapter 7 has focused on the most frequent and most contrasting determiner types: indefinite determiners and definite/demonstrative determiners for the pragmatic functions of labelling, non-specific reference, discourse-given (maintenance and shift combined), discourse-new-mk (exp and end combined) and discourse-new-nmk (§7.2).

In the input (§7.3), nouns with an indefinite determiner are strongly associated with labelling and non-specific reference. There is a dissociation of this form with discourse-given reference, which is, in turn, associated with definite/demonstrative determiners. For discourse-new-mk, there are no clear associations or disassociations but definite/demonstrative and possessive nouns are most frequently used. The pragmatic function of discourse-new-nmk could not be analyzed, since it occurred too infrequently in the input (§9.2.2).

The children show sensitivity to the non-specific/specific distinction in reference from the moment that they produce enough determiners to carry out statistical
analyses on form-function associations (2;3 for English and French, 2;9 for Dutch, Table 9.2). There is a strong, adult-like association of indefinite determiners with non-specific reference and labelling, whereas definite/demonstrative determiners are disassociated with these functions. This result confirms those from earlier studies on three-year-olds for English (Schaeffer & Matthewson, 2005) and extends this finding to Dutch and French and to younger children: two-year-olds.

<table>
<thead>
<tr>
<th>Factors</th>
<th>Dutch</th>
<th>English</th>
<th>French</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specificity</td>
<td>2;9</td>
<td>2;3</td>
<td>2;3</td>
</tr>
<tr>
<td>Givenness</td>
<td>2;9</td>
<td>2;3</td>
<td>2;3</td>
</tr>
<tr>
<td>Familiarity (MK/NMK)</td>
<td>after 3;3</td>
<td>emerging 2;9-3;3</td>
<td>emerging 2;9-3;3</td>
</tr>
</tbody>
</table>

The children are also sensitive to the new/given distinction in determiner use from the earliest age points for which associations can be determined statistically (Table 9.2). That is, they disassociate indefinite determiners and discourse-given referents, but they do use nouns with an indefinite determiner for discourse-new referents in all three languages. Young children's sensitivity to the new/given distinction has been found before in the area of full forms (e.g. nouns, pronouns) versus non-realized arguments in two-year-olds acquiring English (Guerriero, Oshima-Takane & Kuriyama, 2006). The current study, however, extends this finding by proving that children acquiring English, Dutch or French also apply this distinction to their use of determiners.

There is little evidence for the differential use of determiners according to the familiarity of the referent to the listener (mutual knowledge/no mutual knowledge). An NMK-referent requires the use of a noun with an indefinite determiner, but the Dutch children do not seem to distinguish between MK and NMK in determiner use at all between 2;0 and 3;3. The English and French children show some developing sensitivity. They associate indefinite determiners more strongly with NMK than with MK at the later age points (2;9-3;3). However, they still make many errors. These errors can be interpreted as the result of a lack of perspective taking skills, which are part of the developing Theory of Mind. Considering the remarkable lack of input on this function, it is, however, quite plausible that the children also need more evidence to build up their morphosyntactic insight into the use of determiners in relation to the familiarity of the referent to the hearer (see also §9.4).

The influence of the speed of determiner acquisition on the development of
sensitivity to the pragmatics of reference was also investigated (Research Question B, §3.5). In a non-modular model of language acquisition, a close association in development between the morphosyntax and pragmatics of reference is assumed. This assumption leads to two predictions. Firstly, for those pragmatic factors for which the cognitive basis is supposed to be present already (specificity and givenness, §3.3), the children are expected to start associating different types of determiners with the related pragmatic functions from the moment that these forms have become productive. Secondly, if the cognitive basis for a pragmatic factor is not yet present at the start of productive determiner use (familiarity, §3.3), earlier acquisition of the determiner might then stimulate the earlier (correct) pragmatic application of that form. The relevant question is therefore whether children with similar levels of determiner acquisition, assessed on the basis of the percentage of determiner use in obligatory contexts (§5.3.2.4), but different ages, make comparable form-function combinations. This was investigated both cross-linguistically (§7.5.1) and within languages (§7.5.2).

With comparable amounts of determiners, the children of different ages use determiners in a largely similar and adult-like way in relation to the pragmatic factors of specificity and givenness in discourse. This indicates that, regardless of age, the children start to associate determiners with these pragmatic factors as soon as they start to produce the form. The question is of course, whether children already start working on these associations before they start to produce determiners. More research is needed in this area (see §9.6). Since the sensitivity to specificity and givenness is already at such a high level in the early stages of determiner use, it was not possible to investigate the assumed close association in development between these two factors and determiners. This was, however, possible for the children’s sensitivity to familiarity, which develops later (§3.3). Errors in the use of determiners according to the listener’s perspective remain frequent, even if the children have reached the 90-percent-level of determiner production. However, the English and French children do show some developing sensitivity to mK and nMK at the later age points, whereas the Dutch children do not. As discussed before, the English and French children are ahead of the Dutch in determiner acquisition. This is an indication that earlier determiner development might indeed stimulate the appropriate pragmatic application of this form. Since there were only few nMK-references available for analysis in this age range, future research should gather more data in this age range and later to investigate this result further (see also §9.6).
9.3.2 Associating pronouns and pragmatics

Pronouns generally encode referents with a high cognitive status, that is, referents that are easily accessible to the speaker and the hearer because of (1) givenness in discourse or (2) familiarity of the referents to the listener on the basis of physical presence (§2.4). By examining the distinction between discourse-given-maintenance and discourse-given-shift (§2.3), it was possible to investigate whether children and adults also distinguish between different degrees of givenness in their use of pronouns as opposed to full lexical nouns and proper names. Pronouns can also be used felicitously for discourse-new referents that are physically present (discourse-new-mk-exp), but are generally not appropriate for discourse-new referents that are physically absent (discourse-new-mk-end).

In the input in all three languages, pronouns are strongly associated with discourse-given-maintenance. There is a disassociation of this form with discourse-new-mk-exp and discourse-new-mk-end. The use of nouns shows the opposite pattern. This form is strongly associated with both forms of discourse-new reference and disassociated with discourse-given-maintenance. There are no clear patterns of association or disassociation for referent shift, although proper names seem to be more frequently used for this pragmatic function than for others (§8.3.2). The adults distinguish between different degrees of givenness, pronouns being more frequently used for maintenance than for shift. As for different types of pronouns, personal pronouns are more frequent for discourse-given-maintenance and discourse-given-shift, whereas demonstrative pronouns are associated with discourse-new-mk-exp.

In the children’s language, adult-like patterns of pronoun use are evident from the early age points onwards for both givenness and familiarity (Table 9.3 and §8.4). In all three languages, the children appeared to take account of the pragmatic factor of familiarity in pronoun use from 2;0 onwards, since they hardly used pronouns to refer to referents that are new to discourse and physically absent (discourse-new-mk-end).

Table 9.3. Overview of the age of earliest sensitivity to pragmatic factors in pronoun use in child Dutch, English and French

<table>
<thead>
<tr>
<th>Factors</th>
<th>Dutch</th>
<th>English</th>
<th>French</th>
</tr>
</thead>
<tbody>
<tr>
<td>Givenness</td>
<td>2;6</td>
<td>2;0</td>
<td>2;3</td>
</tr>
<tr>
<td>Familiarity (exp/end)</td>
<td>2;0-2;6</td>
<td>2;0-2;6</td>
<td>2;0-2;6</td>
</tr>
</tbody>
</table>
This apparent early sensitivity to familiarity runs counter to evidence on this point from earlier studies (Küntay & Özyürek, 2006; Matthews, Lieven, Theakston & Tomasello, 2006). The early sensitivity is also radically different from what was found for determiner use, where the children only start to display some sensitivity around the age of three (§7.4 and §9.3.1). Early sensitivity in the subjects of this study is therefore unlikely.

Alternatively, the children may be using pronouns mainly for (discourse-new) referents on the basis of whether they themselves can see them or not, without taking account of the familiarity of the referent to the hearer (§8.6). In these data, it was impossible to distinguish between these two situations. The data could not be coded for joint visual attention, since there were no video-recordings available. The potential role of deixis is supported by the fact that the children favor demonstrative pronouns over personal pronouns for discourse-new reference. This interpretation is also compatible with Clark’s suggestion (2003) that demonstrative pronouns function as attention getters in early child language. On the basis of these considerations, I do not regard the children’s avoidance of pronouns for referents that are not physically present as a result indicating sensitivity to familiarity in pronoun use at age two.

The children are showing sensitivity to the new/given distinction in pronoun use from an early age (Table 9.3). Nevertheless, until age 2;9, the children are being over-explicit in reference in that they use more nouns and fewer pronouns than the adults for discourse-given-reference. This is especially evident for discourse-given-maintenance (Figure 9.2).
This result is in accordance with earlier research, which also points to the development of sensitivity to new/given in discourse between the ages of two and three. For example, Wittek and Tomasello (2005) found that around the second birthday, a group of German children was not sensitive to the previous discourse-context in their choice of referential forms, whereas groups of older two- and three-year-old children were. On the basis of the current longitudinal analysis, children’s developing sensitivity to the new/given distinction in pronoun use has been confirmed and laid out more clearly. It develops between 2;0 and 2;6 and adult-like use of pronouns for (degrees of) givenness in discourse appears around 2;6-2;9. It is possible that children’s initial over-explicitness is related to their developing Theory of Mind (Gundel, Ntelitheos & Kowalsky, 2007). That is, children must learn to assess the listener’s perspective in order

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1 There are also studies that report later adult-like use of pronouns with regard to givenness. For example, Bamberg (1987) found that up to five or six years-of-age, German children use more nouns for discourse-given-maintenance than adults do. This and similar findings might, however, be related to the cognitively complex narrative task that the children in these studies had to perform. This task may have influenced their choice for referential expressions (see also §3.4). The earlier adult-like use of pronouns for givenness found in this study, confirms the finding that children’s sensitivity to pragmatic factors is evident earlier in spontaneous conversation than in narratives (Roelofs, 1998).
to give the appropriate amount of information: not too little and not too much. However, input factors might also contribute. This will be further discussed in §9.4 and §9.5.

9.4 Influence of the input in the acquisition of reference
The role of the input in the acquisition of the interaction between morphosyntax and pragmatics in reference had not been investigated in detail in previous studies (§3.4). The current study aimed to fill this gap. Influence of the input has been investigated in two ways. Firstly, by examining whether language-specific form-function combinations in the input are also evident in the children's early language production, and secondly by studying the role of cue frequency and cue consistency in the input. From an input-driven account of language acquisition, it is expected that the more frequent and consistent a particular form-function combination is in the input, the earlier it will be acquired (§1.2.2).

9.4.1 Influence of language-specific patterns
The children's form-function associations are clearly influenced by language-specific patterns in the input. In determiner use, the French adults use more nouns with a definite/demonstrative determiner for labelling and non-specific reference than the Dutch and English adults (§7.3.2). This cross-linguistic difference may be related to the much wider range of definite nouns for generic reference in French than in English and Dutch (Lyons, 1999: 192 and §2.4.2). From 2;3 onwards, the French children also use more nouns with a definite/demonstrative determiner for non-specific reference and labelling than the Dutch and English children (§7.6.1). The Dutch adults use more demonstrative pronouns for discourse-given-maintenance than the English and French adults (§2.4.2, §8.3.2.2). The same pattern was found in the children's language already at the earliest age points (§8.5). The early language-specific patterns in both determiner and pronoun use are consistent with a usage-based account of language acquisition, which assumes that children acquire language largely on the basis of input experience. The current results provide first supporting evidence for this view in the area of reference and in the morphosyntax-pragmatics interface.

9.4.2 Influence of cue frequency and cue consistency
In the analysis of cue frequency and cue consistency, it is important to note that there are no one-to-one form-function combinations in the input. All
forms can be used for more than one function in all three languages studied (§2.4.1, §7.3.2, §8.3.2). Differences in cue consistency of form-function combinations are therefore difficult to establish. Moreover, differences between some pragmatic functions in terms of frequency in the input are small (§7.6.2, §8.5.2). A detailed investigation of the influence of these input cues would therefore have to make use of a computerized model. The investigation here did, however, make a start in exploring the role of cue frequency and consistency by comparing the extremes: the least frequent pragmatic function, discourse-new-nmk and the most frequent pragmatic function, discourse-given. These functions also have clear patterns of form use with regard to determiners: nouns with a definite/demonstrative determiner are inappropriate for discourse-new-nmk, whereas nouns with an indefinite determiner are inappropriate for discourse-given reference. Moreover, full nouns are not optimal for discourse-given-maintenance. (§2.4.1). The results provide first evidence for the influence of cue frequency and consistency on the acquisition of appropriate, adult-like use of both determiners and pronouns and consequently on the children’s developing sensitivity to the pragmatic factors of familiarity and givenness in discourse (Table 9.4).

Table 9.4. Overview of the influence of cue frequency and cue consistency on the acquisition of determiner use for discourse-new-nmk and determiner and pronoun use for discourse-given reference in child Dutch, English and French

<table>
<thead>
<tr>
<th>Functions</th>
<th>Cue frequency</th>
<th>Cue consistency</th>
<th>Adult-like use of form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discourse-new-nmk</td>
<td>low</td>
<td>no cue – for determiners</td>
<td>after 3;3</td>
</tr>
<tr>
<td>Discourse-given</td>
<td>high</td>
<td>strong – for determiners</td>
<td>D: 2;9 (parallel with sensitivity)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>E: 2;9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>F: 2;3 (parallel with sensitivity)</td>
</tr>
<tr>
<td>Discourse-given (-maintenance)</td>
<td>high</td>
<td>weaker – for pronouns</td>
<td>2;6-2;9</td>
</tr>
</tbody>
</table>

Notes. D = Dutch; E = English; F = French.

The input cue for discourse-new-nmk reference is weak, both in frequency and consistency. The adults’ use of discourse-new-nmk reference is less than 1% of all nominal references. Consequently, there are barely any cues at all as to the appropriate use of determiners for this function (§7.6.2). The children have not yet reached the adult level in taking account of the listener’s familiarity with discourse-new referents in determiner use by 3;3
Although some sensitivity is growing in the English and French subjects, the children in all languages still make the error of using nouns with a definite/demonstrative instead of a indefinite determiner for referents that are not mutually known. This finding could be expected on the basis of the development of Theory of Mind. Nevertheless, the input also seems to be highly relevant here. The children seem to receive hardly any evidence on how to use different types of determiners for this function.

The role of the input is also evident in children’s sensitivity to the new/given distinction. The input cue on how to use determiners for discourse-given reference is strong, both in frequency and consistency (Table 9.4 and §7.6.2). Discourse-given referents are very frequent overall (42%) and nouns with an indefinite determiner are infrequent for this function in the input (less than 6%). The Dutch and French children show an adult-like level of avoiding indefinite determiners in discourse-given reference as soon as determiner use has become frequent enough to establish sensitivity to givenness (2;9 in Dutch, 2;3 in French, §7.4.2). It takes the English children more time to reach the adult-like level. Sensitivity to givenness is evident from 2;3 onwards, but adult-like avoidance of nouns with an indefinite determiner discourse-given is only reached at 2;9. This finding might, however, be related to the impossibility of distinguishing a filler syllable before a noun from the indefinite determiner in English in coding the data (§4.4.1). The results on Dutch and French, where fillers and indefinites can better be distinguished, clearly indicate that children take advantage of the strong input cue to not use indefinites for this function.

The input cue for pronoun use in discourse-given reference is much weaker than for determiner use. The pragmatic function of discourse-given is very frequent in the input (42%). Cue consistency is, however, weaker. Nouns and pronouns are both used to considerable extents for discourse-given referents and also for discourse-new referents that are physically present. Children need some time in learning to appropriately apply this distinction in pronoun use. Although the sensitivity to givenness in pronoun use is already evident at the earliest age points (2;0-2;6, §8.4), it takes the children until 2;6-2;9 in all languages to reach the input level in using pronouns and nouns for discourse-new-mk-exp, discourse-given-maintenance and discourse-given-shift (§8.5.2).
both the early language-specific patterns and the role of frequency and consistency are in accordance with an input-based account of language acquisition, for example the usage-based model, which assumes that children acquire language largely on the basis of input experience (Tomasello, 2003). The current results show for the first time that these input factors also influence language acquisition at the morphosyntax-pragmatics interface.

9.5 Parallel sensitivity to pragmatic factors in determiner and pronoun use for reference

The pragmatic factors of givenness and familiarity influence both determiner and pronoun use. The interaction between morphosyntactic and pragmatic aspects of reference was studied in the same group of children. This offered the opportunity to investigate for the first time whether the children’s sensitivity and the adult-like use of forms develops in parallel for these pragmatic factors (Research Question D, §3.5). Two predictions have been formulated (§1.2.3). Firstly, the interaction between pragmatic factors and morphosyntactic forms may develop across the board, that is, in parallel for determiner and pronoun use. This would imply that, as soon as the cognitive distinction underlying the pragmatic factor is available, children apply this to all relevant morphosyntactic devices. Alternatively, children may acquire the pragmatics of reference earlier in the use of one form than in the use of another, implying more piecemeal acquisition. The latter prediction is in accordance with the usage-based model of language acquisition, especially if the pattern of form-by-form development can be related to cue frequency and consistency in the input.

The children’s use of determiners and pronouns will be compared for the pragmatic factor of new/given in discourse. As I showed in §9.3.2, there are arguments for interpreting the results with respect to familiarity differently. These results will therefore not be used here. Both the earliest sensitivity (§7.4.2 and §8.4) and the age at which the children have reached the adult level in restricting their use of inappropriate or non-optimal forms will be evaluated (Table 9.5, §7.6.2 and §8.5.2). The question then is when the children avoid indefinite determiners for discourse-given reference and full lexical nouns for discourse-given maintenance to a similar extent as the adults.
Table 9.5. Overview of the age of earliest sensitivity and age of adult-like avoidance of inappropriate forms for the pragmatic factor/function of new/given in child Dutch, English and French

<table>
<thead>
<tr>
<th>Forms</th>
<th>Earliest sensitivity</th>
<th>Adult-like avoidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determiners</td>
<td>D: 2;9 (as soon as form use is sufficiently frequent)</td>
<td>D: 2;9 (parallel with sensitivity)</td>
</tr>
<tr>
<td></td>
<td>E: 2;3 (as soon as form use is sufficiently frequent)</td>
<td>E: 2;9</td>
</tr>
<tr>
<td></td>
<td>F: 2;3 (as soon as form use is sufficiently frequent)</td>
<td>F: 2;3 (parallel with sensitivity)</td>
</tr>
<tr>
<td>Pronouns</td>
<td>D: 2;6</td>
<td>D: 2;6</td>
</tr>
<tr>
<td></td>
<td>E: 2;9</td>
<td>E: 2;9</td>
</tr>
<tr>
<td></td>
<td>F: 2;3</td>
<td>F: 2;9</td>
</tr>
</tbody>
</table>

Notes. D = Dutch; E = English; F = French.

The data of the Dutch and English children pose some problems for interpretation. The Dutch children show sensitivity to givenness in pronoun use from 2;6 onwards. The earliest age for which sensitivity in determiner production in Dutch can be established is 2;9. Before that age, the children use too few determiners. Earlier sensitivity to givenness might therefore be present, but cannot be established. Because of the slower acquisition of determiners compared to pronouns, a fair comparison of the age of earliest sensitivity and adult-like usage cannot be made in this language.

The earliest age at which sensitivity in determiner use can be established for the English children is 2;3. Before that age, the children produce too few determiners. Sensitivity in pronoun use is also already evident around this age (2;0). These data thus suggest a parallel development of sensitivity to givenness. The English children reach the adult level of form use at 2;9 for both determiner and pronoun use, again suggesting parallel development. However, in English, a filler cannot be distinguished phonetically from the indefinite determiner in coding (§4.4.1, §9.4.2). Therefore, the English children’s attempt to produce a determiner at all between 2;0-2;6 may have been inevitably analyzed as an indefinite determiner (and thus as inappropriate for discourse-given), leading to an underestimation of the moment at which they reach the adult level in determiner use.

The data of the French children offer the best possibility of investigating the issue of parallel development: determiners are acquired early and fillers can be better distinguished than in English. The French children show parallel sensitivity to the new/given distinction in determiner and pronoun use from 2;3 onwards. This is evidence for across-the-board application of cognitive attainments in
language. In terms of adult-like usage of appropriate and inappropriate forms, however, there is evidence for piecemeal development. Between 2;0 and 2;6, the French children are closer to the adult level in their determiner use than in their pronoun use. The children correctly avoid using nouns with an indefinite determiner for discourse-given reference already at age 2;3. In contrast, they use many more nouns for discourse-given reference (both maintenance and shift) than the adults and reach the adult level of pronoun use for discourse-given only at 2;9 (§7.6.2 and §8.5.2). The analysis of the input in terms of cue consistency can explain this difference. As was discussed in §9.4.2, the cue consistency in the input on how to use indefinite determiners, which are inappropriate in discourse-given reference, is strong. The consistency in the use of pronouns for discourse-given referents is, however, much weaker: pronouns, nouns and proper names are all used to a considerable extent. Because of the less systematic form-function associations of pronouns in the input, the French children seem to need more time to appropriately apply the new/given distinction in pronoun use than determiner use.

In sum, the French data suggest that sensitivity to the new/given distinction in the use of different morphosyntactic forms develops in parallel. That is, once a cognitive distinction is available (new/given), children apply it to different morphosyntactic forms. However, development in a more piecemeal fashion is evident from the speed with which children reach the adult level in using the appropriate or most optimal form. Input cues can explain the difference in the speed of development between determiners and pronouns. This is in accordance with the usage-based model of language acquisition. The current result needs to be investigated further for languages in which the determiner is also acquired early, for example Swedish or Italian (Bohnacker, 2003; Kupisch, 2006a).

9.6 Implications: the modularity debate and further research
The findings in this research have implications for linguistic theory and further research. Firstly, there are implications for the assumption of modularity within language and between language and cognition. In language acquisition theories, the nature of the interaction between different language modules and between language and cognition is rather unclear (§1.2.4). It has been demonstrated in this study that children show sensitivity to the pragmatic factors of specificity and givenness as soon as they start to use morphosyntactic forms productively. Previous work had indicated that the cognitive basis for non-specific/specific and
new/given is present before two years-of-age. This raises the question whether children might already start to link cognitive attainments with the pragmatics and morphosyntax of reference prior to productive determiner and pronoun use. This could be further investigated by conducting comprehension experiments with children under two years-of-age. In addition, the influence of the development in one module on the development in other modules is logically excluded under the assumption of modularity, since modules develop autonomously. However, the current study has demonstrated that mutual influence is possible. That is, the English and French children, who are ahead of the Dutch in terms of determiner acquisition, show earlier sensitivity to the familiarity of the referent to the hearer (MK/NMK) in determiner use. This finding is more consistent with a non-modular perspective of language acquisition. More research is needed on this topic. A future study should gather more data in which children communicate about not mutually known and/or not physically present referents. The current study has shown that spontaneous conversations with children lead to few references to NMK- and END-referents. In an experimental study of children’s language production, situations in which children must refer to NMK-referents and/or END-referents can be created, for example through the intervention of an investigator who asks the children about situations or objects that are not mutually known or not visible to the investigator. The children’s performance on this task in terms of determiner and pronoun use can then be compared to their general language level, which can be independently assessed in linguistic tasks. The cross-linguistic aspect of the current study can also be further developed. Performance on NMK-reference by children who acquire languages in which the determiner develops early, for example Italian, Spanish or Swedish, can be compared to the performance of children in languages with slower determiner development, for example German (Lléo, 2001; Bohnacker, 2003; Kupisch, 2006b).

An investigation of reference in children with Specific Language Impairment (SLI) may also be fruitful in order to further examine the interaction between morphosyntax and pragmatics in the acquisition of reference. Language develops more slowly in these children, but cognitive aspects are assumed not to. This can shed more light on the dependence or independence of language and cognition in general and morphosyntax and pragmatics in particular. If the cognitive capacities of children diagnosed with SLI are unaffected by the disorder, they should be able to apply pragmatic factors from the moment that morphosyntactic forms become available. Fewer errors in the use of determiners for NMK-reference would then
be expected in SLI-children, since their Theory of Mind is further developed once they start to use determiners. However, if SLI children experience difficulties with both the morphosyntax and pragmatics of reference, this would support the view that morphosyntax and pragmatics are closely related in development. First results from Puccini (2008) indicate that this is indeed the case. He investigated the development of reference in three English-speaking children with SLI using the same method as in the current study. The SLI-children in Puccini’s study follow a very similar course of development as the normally developing children. Most interestingly, the SLI-children make as much errors as the normally developing children in discourse-new-nmk, despite being on average one-and-a-half year older.

Secondly, the current study has shown that the input influences the acquisition of the morphosyntax and pragmatics of reference. These findings are in accordance with the input-based, constructivist theory of language acquisition. In this theory, children’s linguistic knowledge is assumed to be at first largely item-based. On the basis of the input, children learn concrete linguistic items or expressions via imitation, which they gradually learn to categorize and generalize (Tomasello, 2003). It is possible that the acquisition of the interaction between morphosyntax and pragmatics also fits in this item-based model. Pine and Lieven (1997) have found that the choice for an indefinite or definite determiner is partially lexically specific and also bound to specific syntactic environments. These syntactic environments of determiners (and possibly also pronouns) might in turn be linked to certain pragmatic functions. In the current study, the use of referential expressions was not analyzed in relation to syntactic context. It is, however, quite plausible that the use of indefinite determiners for discourse-new-nmk reference is frequently connected to the syntactic construction has got in English, as in example (1). In addition, the arguments in certain verbal constructions, such as got to or want, might be associated with non-specific reference as defined in this study (§2.3). This applies not only in English, but also in French and Dutch. In the Dutch examples in (2), the child refers to one item out of many that he wants to have with a numeral (2a) and with a filler-noun combination (2b). Finally, the use of demonstrative pronouns may be related to discourse-new reference in labelling constructions, in which children first introduce an item to subsequently label it, as in (3), or to discourse-new in questions or directives, as in (4). The possible influence of syntactic constructions in the input on the acquisition of determiner and pronoun use for pragmatic functions also needs to be investigated further.
Spontaneous data from a dense database are the best means to investigate this issue. Both the child's language and the input are extensively covered in dense databases, which offers the best opportunity to find frequent syntactic frames (Tomasello & Stahl, 2004).

(1) Use of indefinite determiner for discourse-new in has got-construction (Peter, 2;6, English)

inv: Oh, I see, which one's the daddy?
%act: Peter points to larger horse.
inv: Why.
chi: It's got a long neck.

(2) Use of numeral (a) and filler (b) for non-specific reference in want-construction (Matthijs, 3;0 and 3;3, Dutch)

a. chi: Ik wil nog een! (3;0)
   'I want another one'

b. chi: Ik wil # (manda)rijn! (3;3)
   'I want a tangerine'

(3) Use of demonstrative pronoun for discourse-new in labelling construction (Anne, 2;3, French)

chi: Ça, jus d’o(r)ange.
   'That, orange juice'

(4) Use of demonstrative pronoun for discourse-new in question (a) and directive (b) (Peter, 2;3, English)

a. chi: What's this.

b. chi: Look at that.

Thirdly, the data in the current study have shown that the topic of conversation influences the form-function associations of both children and adults. Certain discourse topics or activities lead to the use of particular form-function combinations. For example role-giving in pretend play appears to trigger the use of more nouns with a definite/demonstrative determiner for labelling in child language and in the input. The role of the discourse topic is an area that needs further examination. What exactly is the distribution of form-function combinations over different topics and how does this influence the children's language and the input? Are the form-function combinations in the input different from those in adult-to-adult language as a result of discourse topic? Do form-function combinations change as children grow older and the topic
of conversation changes? One of the most striking findings from this study is the virtual absence of reference to not mutually known entities in the children's language and, to an even larger extent, in the input. Both the children's and adult's references in the data are centered on the here-and-now. It has been suggested in §9.3.1, that the children's late acquisition of correct form use for \textit{nmk}-reference is related to this lack of input. This needs to be investigated further. Future research should track the expected increase of \textit{nmk}-references in child directed speech over time. At the moment, there is early evidence that the percentage of talk about the non-here-and-now in parent-child conversations clearly increases between 1;9 and 3;9 (De Blauw & Baker, 2008). This increase may very well lead to more \textit{nmk}-references in the input. The question is whether an increase of \textit{nmk}-references in the input directly influences children's acquisition of correct form use. Alternatively, it is known that parents closely follow up on the child's choice of discourse topics (Ninio & Snow, 1996). It may therefore also be the case that the increase of \textit{nmk}-references in the input merely follows the children's developing cognitive capacities and, as a result of that, their correct form use for \textit{nmk}-reference. A longitudinal investigation that covers data beyond the age of three, in combination with an assessment of children's developing cognitive capacities, is needed to answer these questions.