

Antisymmetry And The Lefthand In Morphology*

Frank Drijkoningen

Utrecht Institute of Linguistics-OTS. Department of Foreign Languages
Kromme Nieuwegracht 29. 3512 HD Utrecht. The Netherlands
Frank.Drijkoningen@let.uu.nl

Received: December 13th 1998

Accepted: March 17th 1999

Abstract

As Kayne (1994) has shown, the theory of antisymmetry of syntax also provides an explanation of a structural property of morphological complexes, the Righthand Head Rule. In this paper we show that an antisymmetry approach to the Righthand Head Rule eventually is to be preferred on empirical grounds, because it describes and explains the properties of a set of hitherto puzzling morphological processes —known as discontinuous affixation, circumfixation or parasynthesis. In considering these and a number of more standard morphological structures, we argue that one difference bearing on the proper balance between morphology and syntax should be re-installed (re- with respect to Kayne), a difference between the antisymmetry of the syntax of morphology and the antisymmetry of the syntax of syntax proper.

Key words: antisymmetry, Righthand Head Rule, circumfixation, parasynthesis, prefixation, category-changing prefixation, discontinuities in morphology.

Resum. *L'antisimetria i el costat esquerre en morfologia*

Com Kayne (1994) mostra, la teoria de l'antisimetria en la sintaxi també ens dona una explicació d'una propietat estructural de complexos morfològics, la Regla del Nucli a la Dreta. En aquest article mostrem que un tractament antisimètric de la Regla del Nucli a la Dreta es prefereix eventualment en dominis empírics, perquè descriu i explica les propietats d'una sèrie de processos fins ara morfològics —coneguts com afixació discontinua, circumfixació o parasíntesi. Considerant aquestes i altres estructures morfològiques més estàndards, proposem que una diferència que té a veure amb l'equilibri propi entre morfologia i sintaxi s'hauria de reprendre (re- respecte a Kayne), una diferència entre la antisimetria de la sintaxi de la morfologia i la antisimetria de la sintaxi de la pròpia sintaxi.

Paraules clau: antisimetria, Regla de Nucli a la Dreta, circumfixació, parasíntesi, prefixació, prefixació amb canvi de categoria, discontinuïtats en morfologia.

* The research reported here is part of the research program defined and financed by the Utrecht institute of Linguistics-OTS. I wish to single out Peter Ackema, Hans den Besten, Reineke Bok, Hans Broekhuis and Jan Don for inspiring discussion: without them, section 4 would not have existed.

Table of Contents

1. Introduction

This paper is inspired by Kayne's work on the antisymmetry of syntax (Kayne 1994), and more in particular the section in which he claims that his syntactic theory derives the ordering facts that are ordinarily accounted for by the morphological Righthand Head Rule. In this paper we look into a number of standard morphological structures which are generally discussed by morphologists working with the Righthand Head Rule. The basic question is whether there are empirical facts that might favour or disfavour the antisymmetry approach. We have put the emphasis on the empirical side because —after all— Kayne shows that the Righthand Head Rule (henceforth RHR) can be subsumed under the antisymmetric principles, but he does not fully elaborate the morphological issues concerning righthand / lefthand members of morphological structures.

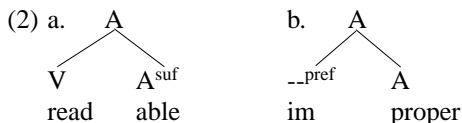
In the first section we will discuss two classical formulations of the RHR, and we show that antisymmetry cannot deal directly with most of the traditional lefthand members of a morphologically complex word. The conclusion of this section is that the syntactic antisymmetry approach is —until further notice— empirically inferior to the morphological approach. In the second section we will discuss one particular group of morphological affixes, discontinuous affixes. They cannot be explained by the RHR, while we show that the discontinuity can be explained by the antisymmetry approach. The conclusion of this section is that the syntactic antisymmetry approach is empirically superior to the morphological RHR approach. In elaborating the theory for these particular discontinuous affixes, we encountered a number of problems, both of a conceptual and a technical nature. Section 4 discusses these in a brief way; eventually the solutions proposed in this section bear on all properties of morphology. In section 5, finally, we show that the proposals made for independent reasons in section 4 also allow us to explain the problematic cases of the first section in a relatively straightforward way. The grand total of all this will be that the antisymmetry approach is empirically superior to the morphological RHR, but on the other hand also that the morphological RHR is strongly confirmed as a property relevant at a surface-level —as a property of the string passed to the phonological component.

2. Two classical formulations of the Righthand Head Rule

2.1. Williams' RHR

The first formalization of the (ancient) idea that the suffixal part of morphologically complex words is the element that determines the category of the word can be found in Williams (1981), cf. (1). Two examples are given in (2).

(1) In morphology, we define the head of a morphologically complex word to be the righthand member of that word.



The rule in (1) is part of the formalism, in the sense that it determines the label of the top node, in a «bottom-up» manner. In more recent terminology we would say that, during the merger of two morphological constituents, the righthand constituent is the constituent that is determining the label of the constituent created by merge.

On the empirical level, Williams (1981) acknowledges the existence of «systematic exceptions», like *ennoble* and *enlarge* —the more traditional class of «category-changing prefixation». It is clear that these form a rather fundamental problem for the RHR: they also exist in the Romance languages, and in Germanic languages they are abundant.

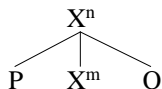
On the empirical level, it is also well-known that English and Germanic compounding is directly accounted for. Compounding in Romance, however, presents another class of rather fundamental problems. Examples are *timbre-poste* (litt. Stamp-post, post-stamp) or *essuie-glace* (litt. Whipe-windshield, windshield-whiper).

Finally, the rule is limited to prefixation and suffixation, but does not deal with the traditional cases of «infixation» or «circumfixation». We will return to circumfixation below —it is also known as «parasynthesis».

2.2. Selkirk's RHR

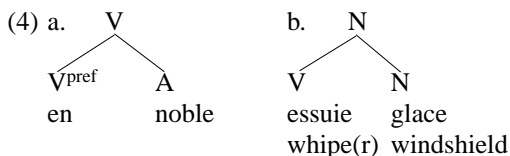
The criticisms directed against Williams (1981) led Selkirk (1982) to the formulation of the Righthand Head Rule given in (3).

(3) In a word-internal configuration:



where X stands for a syntactic feature complex and where Q contains no category with the feature X, X^m is the head of X^n .

The examples given above in (2) are treated in the following way. If the top-category is A in (2), then the head of this constituent is the rightmost element with the category A, hence the suffix (in 2a), or the word (in 2b). This rule is formally different from the one proposed by Williams. It works in tandem with an X-bar rule system, which works in a «top-down» manner. Eventually, it is this top-down property that enables Selkirk to account for category-changing prefixation and a number of the Romance compounds, as illustrated in (4).



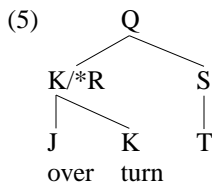
With respect to (4a), if the top node is known (V), then it is necessary for X-bar theory that there be a verbal head, and it is true that this verbal head (the prefix) is the rightmost element that has a category matching the category of the top node. In essence, category-changing prefixation is solved, but the formalism looks very rich (it lets intervene both X-bar theory and RHR). With respect to (4b), this example is solved if one takes only into consideration the category. However, it does not explain the more interpretative properties of the compound (the windshield remains the object at an interpretational level). In addition, Selkirk's approach does not solve all Romance compounds: if the categories of the two members are identical, as in the case of *timbre-poste*, the prediction is wrong (*poste* would be the head according to (3)). Hence, Romance compounding is not really solved.

2.1.3. Di Sciullo & Williams' Relativized RHR

After these two classical formulations of the RHR, Di Sciullo & Williams (1987) defined another one, a Relativized RHR. In their analysis, the morphological order in (4b) reflects the syntactic word order; but they do not address examples of the type in (4a). We will not further discuss this rule here. The reason for the absence of discussion here is that the notion of «relative» head in morphology is incompatible with syntactic structures in the first place (syntax in the GB sense, the situation could be different in a HPSG framework). In other words, «relativeness of heads» presents an issue that goes beyond properties of linear order.

2.4. Kayne's approach to the RHR

Kayne (1994) claims that the antisymmetry approach that he developed for fully independent syntactic structures subsumes the RHR. As an illustration he gives the structure in (5).

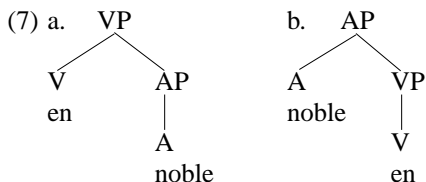


The string can only be linearized properly (in the formal interpretation) if the result of moving J to K results in the label K for the morphological complex. It is his Linear Correspondence Axiom ultimately that assures (5). On a less abstract level, the LCA assures (6a). In practice, words like the one in (6b) derive from a deeper source with two independent heads.

- (6) a. $[_{H1P} H1 [_{H2P} H2]] \Rightarrow [_{H1P} H2_i + H1 [_{H2P} t_i]]$
 b. modern+ize \leq [ize [modern]]

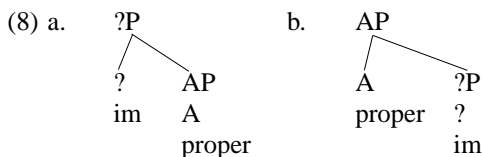
The claim is a very interesting one, in the sense that the quite general observation that all syntactic movement is upward-leftward, is directly relevant for the righthand headedness of structures making use of Head-movement. It cannot be accidental that leftward-upward movement of Heads generates orders that morphologists tend to explain by the RHR.

Let us first reconsider the cases that Williams (1981) claimed to be «systematic exceptions» —category-changing prefixation. Basically, there are two possibilities, each illustrated in (7).



(7a) gives the correct category for the prefixed verb: it is a verb derived from an adjective. However, Kayne's formalisations work in a way in which only left-adjunction is allowed. Right-adjunction is barred, and therefore the correct order *en+noble* cannot be derived. Conversely, if one resorts to the permitted left-adjunction, (7a) surfaces as the ungrammatical *noble+en*. In other words, this class of verbs cannot be derived by using (7a). (7b) on the other hand can give the right order of elements through left-adjunction (*en+noble*); but (7b) is not the correct representation because the category of the whole is not correct. All in all, category-changing prefixation cannot be dealt with in this fashion.

In addition, questions may be raised with respect to all prefixes. One of the attractive properties of Williams' rule was that it explained why it is impossible to determine the category of a prefix —the prefix is always to the left of the head. Consider then (8).



(8a) illustrates the same problem as (7a). Moving *proper* to the prefix in the allowed way —left-adjunction— gives the wrong linear order: **proper+im*. Right-adjunction is not allowed, so the ordering problem remains. In addition, a decision has to be taken as to the category of the prefix; perhaps NegP for this case (but this is quite troublesome: *improper* does not seem to function in syntax as a NegP; it simply seems to function as an adjective). In fact, (8b) fares better: left-adjunction derives the correct order, and the category of the complex word is correct. Next to a decision to take for the category of the prefix, one would be forced to conclude that prefixes are in fact the original head of the complement —that a NegP is neither an adjunct, nor a specifier, but a complement. This has a counter-intuitive flavour we will not elaborate here (e.g. the scope of negation). And the counter-intuitive flavour specifically holds for this class of prefixes, not for all cases (it can be a viable solution for a number of cases (see last section of this paper).

As a conclusion to this section, Kayne's antisymmetry explanation of the RHR is at the very best empirically equivalent to Williams' formulation of this rule. It is subject to the same type of counter-examples, and looks less valid if the ordinary prefixes are not treated more extensively. In section 5, we will return to the prefixes. First, in section 3, we will show that the antisymmetry approach is capable of treating a class of examples which has been beyond the scope of the RHR to begin with.

3. Circumfixation

In a phrase structure rule system, circumfixation (also called «parasyntesis») has been described as a morphological instantiation of the general schema of (9).

(9) $A \rightarrow B A C$

One of the clearest examples is Past Participle Formation in Dutch and German. Initially, this morphological rule simply looks like (10). One takes a verb, adds a prefix and simultaneously also a suffix.

(10) Past Participle Formation: $V \rightarrow ge + V + t$
 ex. $\text{pak} \rightarrow ge + \text{pak} + t$

It is obligatory to add both affixes, as illustrated in (11). This requirement can be formulated in a generalized way, as in (12).

(11) $ge+huil+d$ * $ge+huil$ * $huil+d$ ('cried')
 $ge+werk+t$ * $ge+werk$ * $werk+t$ ('worked')

(12) $B A C$ * $B A$ * $A C$

The subject has been commented as follows, by Spencer (1991).

- (13) Some morphologists regard such duets as a special kind of discontinuous affix, a circumfix. Many linguists would argue that all cases of alleged circumfixation can be reduced to suffixation and concomitant prefixation.

With respect to these comments, which tend to deny the relevance and the mere existence of circumfixation, it is relevant to note two things. Although the informal description «concomitant» is close to the intuition of the native speakers, it is not formalized. That is, although one might agree on the fact that suffixation and prefixation are concomitant in circumfixation, morphological theory never has given a specific formalisation of the relation between the two affixes that apparently exists. In that sense, «many linguists» should try to formalize the very notion of «concomitant». We will argue in what follows that «concomitant» can be interpreted as a Spec-head relation.

In these comments it is also rather clear that the problem posed by circumfixation stems largely from the discontinuity of the process. It is known that morphological structures cannot deal with discontinuities. But —crucially— syntactic theory can deal with discontinuities; in fact, one might say that large parts of movement theory are motivated by (linearly) discontinuous relations in structures. At this point, one of the crucial properties of Kayne's antisymmetry approach is important: it is based on movement. Hence, deriving the RHR from movement theory opens the road for the explanation of morphological discontinuities. This is in fact what we argue for here.

Past participle formation in Dutch and German has been the topic of discussion in syntax, in phonology and in morphology. Although not all problems have been solved, the syntactic properties of past participles are clear in isolation; the same holds for the phonological properties of past participles. It is the morphology (and the position of the morphological component) that is subject to discussion.

In syntax, past participles are considered to consist of one form, but with several interpretations. In this respect, consider (14).

- (14) a. Hij heeft het boek gelezen (perfective participle)
He has read the book
- b. Het boek wordt gelezen (passive participle)
The book is being read
- c. Het boek is aangekomen (perfective participle ergative)
The book has arrived
- d. Het door iedereen geciteerde werk (perfective participle passive/adjectival)
The [by everyone cited] work

Current syntactic theory postulates a functional head PART (or P.M.) —independently of issues of checking vs. building. In most analyses, an additional AGR relationship is postulated —independently of the issue of whether this AGR is an

independent head or not. In general, the interpretative differences are formulated in terms of absorption of case / theta features —no absorption in perfectives, the Burzio-generalisation for the others. There is also discussion about the categorial status, V or A, which we do not engage upon here (for sake of concreteness, assume A for PART, licensing an Event-variable in the sense of Grimshaw (1990) for Event-nominalizations, see also Drijkoningen (1997)).

In phonology, on the other hand, PART is neither one head nor one element. There are simply two affixes. As far as (morpho-)phonology proper is involved, there is no evidence whatsoever for the link between the affixes. All rules function properly by taking the affixes in isolation. In this respect, consider (15).

- (15) a. De gewerkte (*gewerkde) dagen. ('the worked days')
 Het vertelde (*vertelde) verhaal. ('the told story')
- b. Hij heeft het hout bewerkt (*ge+be+werk+t)
 He has the wood be-work-ed (GE+BE+work+D)
 = He has worked on the wood

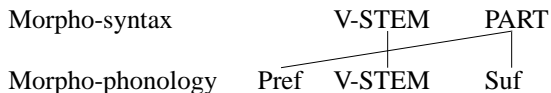
For (15a) one needs a phonological rule that deals with the choice between /d/ and /t/. This rule is dependent on the voice of the final consonant of the verbal root, but ignores the prefix. In fact, the rule generalizes with the voice-alternation found with the suffixes for past tense (without prefix in the first place). In (15b) there is a phonological rule that may delete the prefix part of the past participle; this rule ignores the suffix, and only takes into consideration the other prefix in the immediate environment.

To sum up, syntax functions properly while having one functional head (although there are two affixes), while phonology also functions properly while having two independent affixes (although they relate to one head). In other words, past participle formation is a typical morphological problem —or an interface problem.

Shortly above we noted two important problematic aspects of circumfixation —the «concomitant» nature of the affixation process and the «discontinuity» of the affixes. Another problematic aspect can be added to these. In general, it has been impossible to draw a structure of the standard type. That is, one might propose [[ge+V]+t], but this one cannot be correct because [ge+V] is not an independent constituent. Alternatively one might propose [ge+[V+t]], but this one also cannot be correct for the same reason, [V+t] is not an independent constituent either. Should one deny the relevance of the criterion —the constituenthood of the part— then the problem comes back in taking a decision as to which one of the two should be correct. The cause is simple: Both subparts in isolation are ungrammatical —as shown in (11). As a consequence of this, one might propose ternary branching. But ternary branching is no longer standard, i.e. theoretically disallowed. Hence, there is no tenable structure available for past participles.

Now, if there is no structure available, past participles might illustrate a typical interface situation. This track has been defended by Don (1993). He gives the following picture.

(16) Morpho-syntax

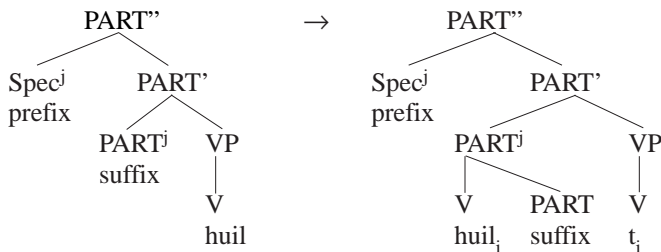


As far as syntax goes, there is no problem, there is one functional head. As far as phonology goes, there is no problem either, there are two independent affixes. The problem is the linking between the two components. Don's proposal illustrates crossing association lines. For a theory of this type, it is worthwhile to note that crossing association lines are not attested elsewhere and probably only occur with circumfixation. Again, the solution does not look principled.

We conclude by saying that although phonology and syntax function properly in their own independent way, there is no principled truly morphological analysis of circumfixation.

As we have indicated above, deriving and explaining morphological ordering by linearization axioms includes the possibility of movement —hence, that movement might explain discontinuities in morphology. As we have indicated also above, using syntactic relationships like Spec-Head Agreement in morphology might explain the «concomitant» nature of the circumfixation process. This gives us the following proposal —which is subject to additional comments in section 4.

(17) Proposal (first version)



As discontinuity is explained by movement, there are necessarily two representations. Movement falls within the boundaries set by the theory (Head-Movement Constraint, and for antisymmetry: left-adjunction). For syntax, the one functional projection that is needed is present; it has the complement it normally takes in syntax. For phonology, there are two affixal pieces, as desired. The relationship between the two pieces is encoded by Spec-Head Agreement, by using the Specifier position of PART. This means that we formalize the intuition «concomitant» as a syntactic relation between two morphological pieces, not a phonological one.

As a result, the two most important problems dissolve. In addition, the additional morphological problem also dissolves. The suggestion of ternary branching need no longer be entertained; the structure is binary. What led to the suggestion of ternary branching (the problem of the constituenthood of the parts) also has a clear answer: at surface-level the structure is [ge+[V+t]]; [[ge+V]+t] is excluded.

Generalizing the proposed analysis, we can say that in each case a phrase structure rewrite system has rules of the nature $A \rightarrow B A C$, the cases are to be dealt with in the way indicated in (18), a more general recipe for parasynthesis:

(18) Abstract level: $B=Spec\ C=Head$, taking the projection of A as a complement.

Surface level: Head of A moves to C (by LCA: leftward head adjunction)

When we return to the main topic of this paper, this section essentially shows that the antisymmetry approach to the RHR is capable of explaining circumfixation—a traditional morphological process that has remained beyond the scope of most formalized morphological theories, including those making use of the RHR.

This section shows empirical superiority of the antisymmetry approach to the RHR. But it is important to remark in addition that the RHR itself is also strongly confirmed. When one considers (17) again, it is useful to remark that the head of the past participle projection is in fact the suffix: Inside PARTP the prefix is a specifier and the suffix the head; at surface-level the head occurs indeed at the right-hand of the complex word. In other words, as predicted by the RHR, the rightward element—the suffix—is the head of the past participle; circumfixation essentially consists of adding a specifier to this morphological head.

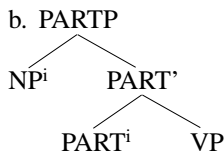
4. Problems and solutions

Although our proposal in (17) has some explanatory value, it is also subject to a large number of additional comments—or criticisms. That is, more general properties of the theory are incompatible with this analysis. We will discuss three of these in this section.

4.1. The Specifier of PART

One of the first criticisms that may be raised against (16) comes from syntax. As shown, the functional head PART has a Specifier position. But in all analyses I am aware of, the Specifier position of PART is used for movement (overt or covert) of maximal projections. For instance, the French sentence in (19a) is analysed as in (19b); in (19b) the Specifier position of PART is used by the NP, which itself is related to the head via Specifier-Head Agreement (and triggers actual morphological agreement).

(19) a. Les paquets_i sont [_{PARTP} t_i PART [arrivés t_i]]
The packages have arrive+PART(+AGR)

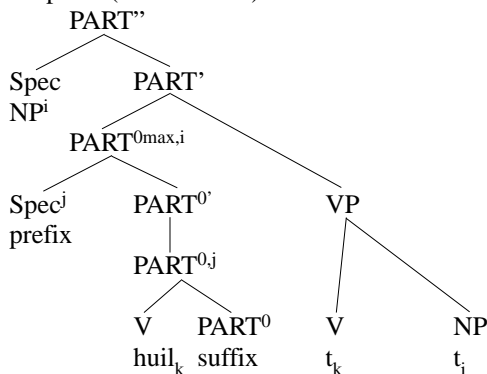


This is not an isolated case. In fact, it illustrates a huge problem of the proper balance between morphology and syntax. If one wishes to subsume morphological ordering under syntactic linearization axioms it is necessary to add a view on the proper balance —otherwise every difference between morphological and syntactic structures disappears.

In order to deal with this problem, we have the following suggestion. In Chomsky (1995) one can find the constituent T^{0max} . The very idea of having a T^{0max} entails that there should also be a T^{0min} . In other words, inside the syntactic Head there is a distinction between some «maximal» head and a more «minimal» head. This gives us space to build the distinction between the two notions of specifier that are needed. The Specifier position of the syntactic head is the maximal projection (as in (19)), while the specifier position of the morphologically minimal head is the prefix in the sense of (17). In this way, the analysis takes up a «-1» projection, or in a more general sense, the ideas of Ackema (1995) who uses $X^{morph-max}$.

Our final proposal is thus that the NP in (19) is the Spec of X^{max} , while the prefix in (17) is an internal Spec of X^0 :

(20) Proposal (final version)



4.2. The notion «specifier» in morphology

A second problem is formed by the nature of morphological structure by itself. In developing their Righthand Head Rules, both Williams and Selkirk built in assumptions and proposals about morphological structure. In essence, our proposal entails that most of these should be revised or reformulated. Here we indicate some important differences very briefly.

Both Williams and Selkirk built in a distinction between a Head and a Nonhead, but they did not postulate differences among Nonheads at the formal level. In syntax there are formal distinctions among Nonheads: complements, specifiers and

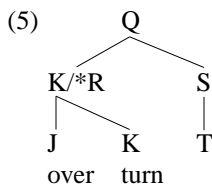
adjuncts. As our proposal makes use of Specifier-Head Agreement, we need the «syntactic» definition of the Nonheads.

Both Williams and Selkirk make use of adjunction, but they do not have projection in the formal sense: every operation is an adjunction. Although adjunction also exists in syntax, not every operation is an adjunction, there also is «projection» in the sense of X-bar theory. In other words, what Selkirk calls an X-bar theory for words is essentially different from an X-bar theory for phrases (as she herself explicitly admits). As our proposal makes use of Complements and specifiers, we need the «syntactic» definition of X-bar structures also for morphology.

In general then, our proposal entails a much more «syntactic» definition of morphological structures (see also Ackema (1995)).

4.3. The notion «specifier» in antisymmetry

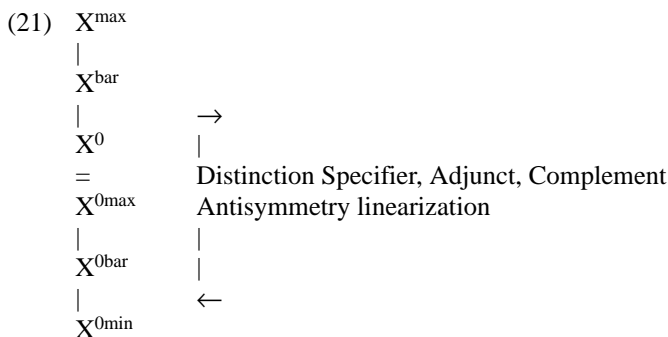
The third problem is formed by technical aspects of the antisymmetry framework as formulated by Kayne. In my view, they are caused by the fact that head-movement is subject to the exact same properties that Williams and Selkirk ascribe to morphological structures. The Kaynian formalisation is based on a distinction between a Head and a Nonhead (a terminal or a non-terminal), but Head-movement always is left-adjunction. This entails that the result of Head-movement always is an adjunction. Consider again (5), repeated here for convenience.



In (5) there is no difference between the «lower» K (the original head) and the «higher» K (the constituent obtained by head-movement): it is adjunction. Just as in Williams' and Selkirk's theories, there is no difference among J's at surface-level. In other words, we cannot build in the very notion «morphological specifier» because there is no specifier position inside words in Kayne's framework.

The solution for this problem in itself stems from the solution we gave for the two earlier problems. The syntax of words is a syntax in the proper sense, with a difference between specifiers, adjuncts and complements—but the syntax of words is of another level than the syntax of syntax. We transpose the linearization axioms in the same way: the linearization of phrases is syntactic, the linearization of words is syntactic too, they are of the same type—but the linearization of words takes place at another level than the linearization of phrases.

Schematized in a model, the theory of the syntax of words gives us (21)—with an accent on what we said in this section.



To conclude, the proposal made in (16) is not simply a solution for circumfixation with some drawbacks. The analysis entails a rather different theory of morphological structure —a theory which is richer and more syntactic than generally assumed. In other words, the antisymmetry approach gives results, but the exact formalizations by Kayne are subject to a number of changes. It is not strictly speaking the syntactic LCA that derives the RHR, it is the LCA applied to morphological structures that derives the RHR. Crucial for this difference is the existence of a «morphological specifier».

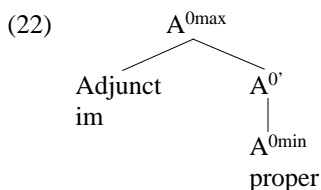
5. Prefixation

In the previous sections we showed that circumfixation can be dealt with in an antisymmetry approach. Now that we have elaborated the analysis and concluded that there are changes to be made in our theory of morphological structure itself, we can return to the initially unanalyzed cases of the first section, i.e. prefixes, both category-changing and category-preserving.

5.1. Prefixation without change of category

In section 3 we noted that our conception of morphological structure entails a «syntactic» division of Nonheads, a distinction between specifiers, complements and adjuncts. With circumfixation we discussed specifiers extensively, while assuming complements without discussion.

The ordinary prefixes can very well illustrate the case of morphological adjuncts, as illustrated in (22).



The following properties point at the relevance of the notion «morphological adjunct»: 1. Adding these prefixes is «free», just like the addition of adjuncts in syntax is «free»: there are no hard structural principles that dictate the presence of adjuncts. 2. Prefixes are in some interpretative relation to the head of the projection, just like adverbs with respect to verbs: but there is not a direct formal syntactic relation between the elements —as opposed to specifiers, which do entertain a formal syntactic relation with their heads. 3. Finally, adjuncts are generally generated on the «left» in structures.

As a conclusion, the prefixes which originally raised questions with respect to the empirical validity of the antisymmetry approach can be dealt with in a relatively straightforward manner, once one accepts the more global changes proposed in section 4.

5.2. Category changing prefixation

This leaves us with the final class of examples, the category-changing prefixes, like *ennoble*. Recall that Williams (1981) and Di Sciullo & Williams (1987) did not provide any solution for these, and the only proposal we have discussed originates in Selkirk (1982).

For the brief discussion of these, we switch to Germanic again, and in particular Dutch. This is basically because of the huge amount of existing literature, probably in connection with the full productivity of the process (at least the process is much more productive than the English or the Romance correlates).

In Dutch there are three different prefixes that may be used in the derivation of a verb from an adjective or a noun, as illustrated in (23).

- (23) a. ver+groot(A) = V ('enlarge')
 b. be+bos(N) = V ('provide with wood')
 c. ont+bos(N) = V ('undo from wood')

As an answer to Selkirk's (1982) weakening of the RHR, there has been defended an analysis which should reinforce Williams' RHR. Neeleman & Schipper (1992) proposed a conversion analysis, thus assigning the structure [pref [X + \emptyset]] to these examples, as illustrated in (24); the analysis carries over to *ennoble*, as shown in (24c).

- (24) a. [_v ver [_v groot (A) + \emptyset (V)]]
 b. [_v ont/be [_v bos (N) + \emptyset (V)]]
 c. [_v en [_v noble (A) + \emptyset (V)]]

Despite its theoretical merits, the proposal is subject to a large number of counter-arguments. These basically all amount to the use of conversion: all generally accepted cases of conversion have properties that do not generalize with (24). The

interpretation of these arguments is that the constituents that are postulated —[groot (A) + \emptyset (V)] e.g.— are not independently motivated.

We suggest here that these are circumfixes with a phonologically empty suffix. The fact that one of the postulated constituents is not motivated recalls the discussion in section 2 about the structural problems of the circumfixes: the parts in isolation are not motivated. Consider then (25).

- (25) a. * Jan [_V groot+ \emptyset] iets
 b. * You [_V noble+ \emptyset] something.
 c. * Peter is [_A en+noble].
 d. * Jan is [_A ver+groot].
 e. * [A C] * [B A] [B A C]

(25a) shows that the verb+suffix in isolation does not exist. The same holds for English, (25b). (25c) shows that the prefix+verb in isolation does not exist either. The same holds for Dutch, (25d). As illustrated in (25e), this pattern is exactly the pattern we discussed for circumfixation.

Bok-Bennema (1996) has also elaborated an analysis along antisymmetry lines, but in her elaboration the prefixes are not specifiers, such that there is no link with the suffix (i.e. the traditional problem of «concomitant» affixation also holds against this analysis).

6. Conclusion

In this paper we have made use of the antisymmetry approach to the morphological RHR. It turns out that the approach in itself is empirically superior to the more original formulations of the rule, but only under some elaborations bearing on the properties of morphological structure.

In discussing a number of crucial cases, we can eventually sum up the following cases for lefthand members of morphological complexes:

- (26) a. [X+Y^{su} [t_x]] modern+ize
 b. [Adjunct^{pref} [X]] im+proper
 c. [Specifier^{pref} [X+Y^{su} [t_x]]] en+noble+ \emptyset / ver+groot+ \emptyset
 d. [Specifier^{pref} [X+Y^{su} [t_x]]] ge+pak+t

In other words, lefthand members of a word can be moved heads of complements, specifiers or adjuncts.

In addition, we remark that this overview is not exhaustive. In the literature there can be found at least two other cases.

First, under both Kayne's and my approach there is no principled ban on prefixes which come to be prefixes by being a morphologically dependent head of a

complement. More in particular, an update of the analysis by Hoekstra et al. (1987) gives the possibility in (27a), for the example in (27b).

- (27) a. [X^{pref} + Y [t_x]]
 b. dat hij [_{AGROP} de weg_i [be_j wandelt] [_{SC} t_i t_j]]
 that he the roads BE +walks
 'that he walks the road'

Second, the difference in compounding between Romance and English / Germanic that remained problematic also in previous accounts, can be linked up to a difference between overt and covert movement, under both Kayne's and my approach. Under our interpretation of morphological structures (as discussed in section 3), the order difference in (28a) can be analyzed by (28b) and (28c).

- (28) a. screwdriver - tourne-vis
 b. [N^{0max} screw_j drive_i er [V^{0max} t_i [N^{0max} t_j]]]
 c. [N^{0max} _____ tourn_i e [V^{0max} t_i [N^{0max} vis]]]

That is, compounding of this type illustrates N^{0min} movement to the Specifier of a higher N^{0max}, overt in French, covert in English. The basic difference between Kayne's analysis of these and ours is that we do agree with e.g. Di Sciullo & Williams (1987) in considering morphologically complex words different from objects constructed by syntactic rules at some level. With respect to (28), data of the type in (29) provide the distinction between Kayne's interpretation of the LCA with respect to the RHR and ours, given in section 3.

- (29) a. I bought a * [lot of screws - driver]
 b. J'ai acheté un * [tourne-beaucoup de vis]
 c. I need it. (it = screwdriver) (*it = screw)
 d. J'en ai besoin. (en = tourne-vis) (*en = vis)

In sum, suggestions as to the existence of «maximal» heads vs. «minimal» heads (e.g. Chomsky 1995) prove useful for morphology —and allow us to make use of the LCA inside morphological structures while maintaining a theory in which morphology and syntax remain distinct modules.

References

- Ackema, P. (1995). *Syntax below zero*. Utrecht: Ph.D.Diss.
 Bok-Bennema, R. (1996). «Dutch Verbalization and the Theory of Morphology». *Yearbook CLCG 1995*, Groningen.
 Chomsky, N. (1995). *The minimalist program*. Cambridge Mass: MIT Press.

- Di Sciullo & Williams (1987). *On the definition of Word*. Cambridge Mass: MIT Press.
- Don, J. (1993). *Conversion*. Utrecht: Ph.D. Diss.
- Drijkoningen, F. (1997). «Morphological Strength: NP positions in French». In Beermann, D.; Leblanc, D.; van Riemsdijk, H. (eds.). *Rightward Movement*. Amsterdam: Benjamins, p. 81-114.
- Grimshaw, J. (1990). *Argument Structure*. Cambridge Mass: MIT Press.
- Hoekstra, T., et al. (1987). «Complexe verba». *GLOT* 10.
- Kayne, R. (1994). *The antisymmetry of Syntax*. Cambridge Mass: MIT Press.
- Neeleman, A.; Schipper, J. (1992). «Verbal prefixation in Dutch: Thematic evidence for conversion». *Yearbook of Morphology 1991*. Dordrecht: Foris.
- Selkirk, E. (1982). *The syntax of Words*. Cambridge Mass: MIT Press.
- Spencer, A. (1991). *Morphological Theory*. Oxford: Blackwell.
- Williams, E. (1981). «On the notions “lexically related” and “head of a word”». *Linguistic Inquiry*.