

The layered lexicon

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0. Introduction

Generalizations concerning the well-formedness of words in a language are usually not true of all words in that language.¹ In German, for example, lexical words may begin with a coronal stop, which may be voiced or voiceless. So, both *Tag* 'day' and *Dach* 'roof' are good German words. If an article starts with a coronal stop, however, it must be voiced. Thus, though *der*, *die* or *das* ('the' masculine, 'the' feminine and 'the' neuter, respectively) are well-formed articles, there are no articles like **ter*, **tie* or **tas*. In this respect the lexicon is layered. Two observations can be made. First, the difference in phonotactics between these words has something to do with the difference in morphosyntactic category. Second, the set of coronal stops allowed to begin a lexical word is {t, d}, whereas the set of coronal stops allowed to begin an article has only one member, {d}. These two observations are accounted for in this paper in a uniform way. Extending a proposal by Ito and Mester (1998) which says that markedness constraints can be separated by blocks of faithfulness constraints, it is conjectured here that faithfulness constraints may be indexed with a morphosyntactic category label. In the case of German, one block of faithfulness constraints is labeled 'lexical' (shorthand for noun, verb, adjective), while another block of faithfulness constraints is labeled 'non-lexical' (shorthand for article).² These faithfulness constraints are ranked among the markedness constraints, which include a constraint prohibiting words from starting with a *t* (*t) and a constraint prohibiting words from starting with a *d* (*d). In order to allow lexical words starting with either *t* or *d*, a faithfulness constraint that requires a faithful parse of underlying *t*'s or *d*'s and which is labeled 'lexical' must dominate both markedness constraints. Another faithfulness constraint labeled 'non-lexical' must only dominate **d* and must, in turn, be dominated by **t*. Thus, the indexing of faithfulness with morphosyntactic labels allows an explanation of the differences between the phonotactics of morphosyntactic categories, while the ranking of these indexed constraints —among markedness constraints— explains the set-subset relation between the phonotactics of different morphosyntactic categories.

The indexing of faithfulness constraints with morphosyntactic categories is a small and natural extension of a use of indices that is widely accepted. In a paper by McCarthy and Prince (1994), phonotactic differences between a root and a reduplicative affix are attributed to the effect of ranking a markedness constraint between two faithfulness constraints, one of which is labeled 'root' and the other 'reduplicative affix'. The effect of this ranking, dubbed *Emergence of the Unmarked*, is that one category shows the effects of a markedness constraint, while that same markedness constraint may be violated in the other category. As

will be argued below, the same *Emergence of the Unmarked* effect can be observed when two morphosyntactic categories are compared.

More specifically, this proposal builds on ideas advanced in Ito and Mester (1998). In their paper, they discuss the nature of the Japanese lexicon, which consists of various layers, called Yamato, Sino-Japanese, Foreign and Onomatopoeic, which differ from one another in terms of the influence of markedness constraints. The phonology of Yamato is the most restrictive, or, put differently, subject to the highest number of markedness constraints of all the layers. Various phenomena that are not attested in the Yamato part of the lexicon are allowed in the Sino-Japanese lexicon. The most liberal part of the lexicon is the Onomatopoeic part. In Ito and Mester (1998)'s proposal these differences are captured in terms of markedness constraints which are ranked among indexed faithfulness constraints.

The remainder of this paper is organized as follows. In section 1 the differences between the phonotactics of various morphosyntactic categories in Dutch and Kashaya are discussed. It will be shown that the variation can be captured by the theory sketched above. In section 2, a process with a morphologically delimited application is considered and it is shown that the theory proposed here actually predicts (and explains) such effects. In section 3, the question is taken up as to why only faithfulness constraints, but not markedness constraints can be co-indexed. Alternative approaches designed to deal with comparable issues are discussed in section 4, and section 5 contains some conclusions.

1. Indexed faithfulness

1.1. Prepositions in Dutch

Simple prepositions in Dutch are syllabically less complicated than nouns, verbs and adjectives. This statement raises two questions: a) what are simple prepositions and b) in what sense are they less complicated than nouns, verbs and adjectives?

Consider the prepositions, given in (1).

(1) *Simple prepositions*

aan, bij, door, in, na, om, op, uit, voor
achter, binnen, boven, buiten, onder, over, tegen.

The simple prepositions can be distinguished from complex prepositions on the basis of two criteria. First, simple prepositions freely allow both nominal and verbal compounding and second, neuter pronominal complements of prepositions are replaced with an R-pronoun (Zwarts 1995).

(2) •*Nominal compounding*

aanval, bijkeuken, doorgang, intocht, nadorst, ombouw, optocht, uitgang, voorkant, achterklap, binnenbrand, bovenkant, buitenkant, ondergang, overtocht, tegenzet.

• *Verbal compounding*

aandoen, bijvallen, doorzetten, invallen, najlen, omdoen, opzetten, uitvoeren, voorvallen, achterstellen, binnenvaren, bovendrijven, buitenspelen, ondergaan, oversteken, tegenvallen.

An example of replacement is given in (3).

(3) *Neuter pronominal complements must be replaced with R-pronouns*

| | | |
|---------------------|-----------------|-----------------|
| Ik zit op het gras. | Ik zit erop. | *Ik zit op het. |
| I sit on the grass. | I sit there on. | I sit on it. |

Complex prepositions, given in (4), contrast with simple prepositions in this respect.

(4) *Complex prepositions*

• *With complex margins:*

benevens, behoudens, betreffende, blijkens, conform, contra, dankzij, exclusief, inclusief, jegens, omstreeks, krachtens, luidens, omtrent, middels, namens, niettegenstaande, nopens, ondanks, ongeacht, onverminderd, overeenkomstig, qua, rond, sedert, sinds, staande, tijdens, trots, uitgezonderd, volgens, wegens.

• *With simple margins:*

à, aangaande, beneden, benoorden, beoosten, bewesten, bezijden, bezuiden, gedurende, gegeven, getuige, gezien, halverwege, hangende, ingevolge, inzake, naargelang, nabij, per, richting, te, vanwege, versus, via, zonder

These prepositions neither allow nominal nor verbal compounding. Moreover, their neuter complements cannot be replaced or left out. This can be seen in (5), where the behavior of the simple preposition *voor* is compared with the behavior of the complex preposition *tijdens*.

(5) a. *Complex prepositions*

| | |
|-------------------------------|--------------------------------|
| Ik schuil tijdens het onweer. | I take cover during the storm. |
| *Ik schuil ertijdens. | I take cover there during. |
| *Ik schuil tijdens het. | I take cover during it. |

b. *Simple prepositions*

| | |
|----------------------------|------------------------------|
| Ik schuil voor het onweer. | I take cover from the storm. |
| Ik schuil ervoor. | I take cover there from. |

*Ik schuil voor het.

I take cover from it.

In other words, as Zwarts (1995) has argued, simple prepositions can be distinguished from complex prepositions on morphological as well as on syntactic grounds. He proposes two representations for prepositions. Simple prepositions have only a feature 'preposition', whereas complex prepositions are characterized as a lexicalized phrase consisting of a prepositional head and a nominal, verbal or adjectival complement. In other words, complex prepositions have an underlying feature 'preposition' as well as a feature 'noun', 'verb' or 'adjective'. Complex prepositions, therefore, have the same phonotactics as these lexical categories.

The next step is to compare the phonotactics of nouns, verbs and adjectives with the phonotactics of (simple) prepositions.

1.1.1. Lexical words and prepositions

Lexical words such as nouns, verbs and adjectives allow complex onsets and codas, both at the margins of a word (6) and word internally (7).

- | (6) | <i>Complex Onsets</i> | | <i>Complex codas</i> | | <i>Complex margins</i> |
|-----|-----------------------|--------------------|----------------------------|--|-------------------------|
| a. | <i>nouns</i> | kraan 'tap' | kink 'hitch, twist' | | plank 'plank' |
| b. | <i>verbs</i> | krijg 'get' | karn 'churn' | | pronk 'show off' |
| c. | <i>adjectives</i> | groot 'big' | mank 'crippled' | | flink 'vigorous' |
-
- | | | |
|--------|------------------|---|
| (7) a. | <i>noun</i> | zebra 'zebra' |
| b. | <i>verb</i> | beklijf 'to stick to one's mind' |
| c. | <i>adjective</i> | écru 'ecru' |

No complex margins are allowed in simple prepositions (cf. (1)), thus it seems that the constraint banning complex margins is active in prepositions but inactive in nouns, verbs and adjectives. This is expressed by having a faithfulness constraint labeled 'noun, verb, adjective' (NVA, henceforth; FAITH_{-nva}) ranked above a constraint against complex margins (*COMPLEX). This constraint, in turn, outranks a faithfulness constraint labeled 'preposition' (FAITH_{-preposition}). As a result, no simple preposition will ever have a complex margin.

The ranking of these constraints is established in tableaux (8) and (9). In tableau (8) the noun *brok* 'chunk, piece, bit' is considered. Two candidates are considered: one with a complex onset and one without a complex onset. The one with the complex onset is better than the one with the simple margin, therefore FAITH_{-nva} will be ranked above *COMPLEX.

(8) FAITH_{-nva} >> *COMPLEX

| | FAITH _{-nva} | *COMPLEX |
|-------------|-----------------------|----------|
| <i>brok</i> | | * |
| <i>bok</i> | *! | |

Tableau (9) illustrates the ranking of *COMPLEX over FAITH_{-preposition}. The candidates *voor* and *vvoor* for the preposition *voor* 'for, before, in front of' are considered. Since the candidate with the simple onset wins, the ranking must be *Complex >> FAITH_{-preposition}.

(9) *Complex >> FAITH_{-preposition}

| | *Complex | FAITH _{-preposition} |
|---------------|----------|-------------------------------|
| ∅ <i>voor</i> | | * |
| <i>vvoor</i> | *! | |

By transitivity, FAITH_{-nva} is ranked above FAITH_{-preposition} and the full ranking is:

(10) FAITH_{-nva} >> *Complex >> FAITH_{-preposition}

The theory presented here thus explains why complex margins are allowed in nouns, verbs and adjectives, while they are never attested in prepositions. Another claim made in the introduction was that one set is always a subset of the other. The reason for this is the ranking scheme of the *Emergence of the Unmarked* (McCarthy and Prince 1994), in which a markedness constraint is ranked between two faithfulness constraints, each of which specifies a morphological category. The category whose faithfulness constraint dominates the markedness constraint will allow violations of the markedness constraint if this is necessary to satisfy the faithfulness constraint. In the morphological category in question everything that is allowed by the markedness constraint is allowed plus everything that is needed to satisfy the faithfulness constraint. In the morphological category of the faithfulness constraint that is dominated by the markedness constraint the set of possibilities is determined by the markedness constraint. The set of possibilities of the latter is therefore (at least) a subset of the set of possibilities of the former.⁴

A final point that should be made here is that no statements concerning possible inputs are needed. The input is chosen in such a way that the correct output is the one that violates the constraint ranking minimally. No statements concerning the input are necessary, since the grammar determines well-formedness. In other words, this proposal is in conformity with the principle of *Richness of the Base* (Prince and Smolensky 1993). This principle says that the only thing that Optimality Theory has to say about inputs is that they are universal. The grammar—the constraint ranking—will always arrive at the correct input-output pairing. Whether the input of prepositions has complex or simple margins, the winning candidate should always be the one with simple margins. Since the markedness constraint barring complex margins dominates the prepositional faithfulness constraint, it will always be more optimal for a candidate to have simple margins, even if this means violating the relevant

faithfulness constraint. For lexical categories, the optimal input-output pairing is the one in which margins are faithfully parsed.

1.2. Instrumental prefixes and verbal roots in Kashaya

In Kashaya, a Pomoan language, instrumental prefixes differ phonotactically from verbal roots in three respects (Buckley 1994).⁵ First, instrumental prefixes never contain closed syllables, but such syllables are allowed in verbal roots. Second, instrumental prefixes do not allow long vowels, while these may occur in verbal roots. Third, mid vowels do not appear in instrumental prefixes, but they do appear in verbal roots.

In Kashaya syllables are of the shape CV, CVC or CVV. Word-finally, superheavy syllables may be found: CVVC and CVCC. These syllable types are not uniformly distributed across the lexicon. Monosyllabic verbal roots may have the following shape: (^H)CV(:)(C). The superscripted H is a laryngeal increment, a laryngeal feature that has the effect of making the preceding syllable heavy. Focusing on the rest of the template, it can be concluded that both open and closed syllables with long vowels are allowed. This contrasts with instrumental prefixes, which have a CV template. Moreover, of the five vowels of Kashaya (i, e, a, o, u), only three are found in instrumental prefixes (i, a, u), whereas all vowels occur in verbal roots. The latter point is explained by Buckley (1994) as a prohibition of the feature [-high], which, in his analysis, exclusively characterizes (e, o), in instrumental prefixes.

Two issues arise here, both of which are connected to the difference between verbal roots and instrumental prefixes. The first is how the difference in the syllable structure of verbal roots and instrumental prefixes can be captured. The second is how the feature [-high] can be blocked from occurring in instrumental prefixes. Both can be explained in terms of a markedness constraint, which is sandwiched between indexed faithfulness constraints.

The absence of codas and long vowels in instrumental prefixes can be captured by ranking markedness constraints against such prosodies above faithfulness to instrumental prefixes.

- (11) *CODA, *LONGVOWEL >> FAITH_{instrumental prefix}

The result of this ranking will be that no instrumental prefix will ever surface with either a long vowel or a coda or both. One may object that the instrumental prefixes' failure to attract stress could explain why they contain no long vowels. However, even though instrumental prefixes are never stressed, the relationship between stress and long vowels in Kashaya is not strong enough to explain the lack of long vowels in instrumental prefixes. Unstressed long vowels do occur, as shown in (12).

- (12) Unstressed long vowels
 q[?]a:mú:c[?]ba 'after leaving each other'

| | |
|----------------------------|---------------|
| his ² u:ʔaǰólay | ‘long arrows’ |
| ʔima:tá | ‘woman’ |
| ca:dú | ‘fly’ |

In short, although stress is the only other factor potentially capable of explaining the distribution of long vowels systematically, it does not seem to be the relevant factor. Since prosody does not determine the distribution of long vowels in Kashaya, their distribution has to follow from something else. Here, the distribution of long vowels is explained in terms of the ranking of a markedness constraint against long vowels with respect to indexed faithfulness constraints.

Since both codas and long vowels are allowed in verbal roots, a faithfulness constraint pertaining to verbal roots will be ranked above the markedness constraints *CODA and *LONGVOWEL.

(13) FAITH_{verbal root} >> *CODA, *LONGVOWEL

The vowel set of Kashaya consists of five vowels, (i, e, a, o, u). The mid vowels (e, o), which are characterized by the feature [-high] in the analysis of Buckley (1994), occur in verbal roots but not in instrumental prefixes. The absence of the feature [-high] in instrumental prefixes, which causes the set of vowels in instrumental prefixes to be smaller than the set of vowels in verbal roots, is explained by the ranking of the markedness constraint *[-high] above FAITH_{instrumental prefix}. No vowel with the feature [-high] will ever be optimal in instrumental prefixes. The constraint *[-high] is dominated by FAITH_{verbal root}, in verbal roots.

In sum, Kashaya verbal roots and instrumental prefixes differ in at least three respects. First, instrumental prefixes do not allow long vowels. Second, they do not allow closed syllables and, third, the feature [-high] never surfaces in instrumental prefixes. These differences can be explained by assuming that the relevant markedness constraints are ranked between indexed faithfulness constraints. This correctly describes their respective phonotactics and it captures the fact that the set of possibilities in verbal roots is larger than the set of possibilities in instrumental prefixes.

Below, in section 2, it will be argued that this indexed faithfulness is capable of explaining why certain phonological processes have a limited scope of application.

2. Morphologically delimited processes

Many phonological processes only apply in certain morphologically determined contexts. A case at hand is Aspirate Dissimilation, an instantiation of Grassmann's Law, in which an aspirated stop is deaspirated if a following consonant is also aspirated (Buckley 1994). This process occurs between an instrumental prefix and a verbal root. If the instrumental prefix starts with an

aspirated segment and the first segment of the verbal root is also aspirated, the aspiration of the instrumental prefix disappears.

- (14)
- | | | | |
|-------------------------------|---|----------------------|---|
| $p^h i^h$ -mi-w | → | pihmíw | ‘see in detail’ |
| $p^h u^h$ -c ^h a-w | → | puhc ^h áw | ‘blow over’ |
| $p^h a$ -hol-ʔ | → | pahólʔ | ‘look for an unseen object with the end of a stick’ |

Why does aspirate dissimilation occur in this environment? The answer is, once again, that various indexed faithfulness constraints can be ranked differently with respect to markedness constraints. The feature [aspiration] is forced to surface due to a faithfulness constraint. This faithfulness constraint can be indexed for certain morphological features, and differently indexed faithfulness constraints may be ranked in a different way with respect to a markedness constraint which says that word-initial consonants may not be aspirated if an aspirated consonant follows. This constraint could be formulated as an OCP constraint on adjacent aspirated consonants.

- (15) $OCP_{[asp]}$
Aspirated consonants may not be adjacent.

In the case of instrumental prefixes, $OCP_{[asp]}$ dominates the relevant faithfulness constraint ($FAITH-[asp]_{instrumental\ prefix}$). These constraints, in turn, are dominated by a constraint saying that any [asp] feature in the root must be faithfully parsed. The result is that the consonants of instrumental prefixes surface without aspiration if the next consonant is aspirated. An example is the underlying form $c^h i^h$ -c^ha:-w ‘grasp with handled instrument’, which surfaces as *cic^háw*. The constraints $FAITH-[asp]_{root} \gg OCP_{[asp]} \gg FAITH-[asp]_{instrumental\ prefix}$ yield this output, as can be seen in (16). Four candidates are evaluated, one with aspiration on both the instrumental prefix and on the root, one with an [asp] feature on the root only, one with an [asp] feature on the instrumental prefix only and one without any [asp] feature.

(16) Tableau of input $c^h i^h$ -c^ha:-w

| $c^h i^h$ -c ^h a:-w | $FAITH-[asp]_{root}$ | $OCP_{[asp]}$ | $FAITH-[asp]_{instrumental\ prefix}$ |
|--------------------------------|----------------------|---------------|--------------------------------------|
| $c^h i^h$ -c ^h áw | | *! | |
| <i>cic^háw</i> | | | * |
| $c^h i$ cáw | *! | | |
| <i>cicáw</i> | *! | | * |

Aspirate dissimilation does not apply in a number of cases. It does not apply to word-internal stops (17a), nor does it apply to word-initial aspirates followed

by an aspirate, or if aspiration is added by an affix which is not an instrumental prefix (17b; in this case a causative affix: ^hqa). It is also triggered by coda aspiration, which aspirates underlyingly plain stops in coda position. This can be observed in (17c), where the final *t* of the first morpheme is aspirated.

- (17) Contexts where aspirate dissimilation does not occur
- | | | | | |
|----|--|---|-------------------------------------|------------------------|
| a. | hi- ^h c ^h a- ^h qa-w | → | hihc ^h áhqaw | ‘knock over’ |
| b. | ^h c ^h a- ^h qa-w | → | c ^h áhqaw | ‘cause to fall’ |
| c. | c ^h at-qa-ti | → | c ^h át ^h qati | ‘going to go trapping’ |

If the constraint in (15) were highly ranked in Kashaya, no adjacent aspirated consonants would ever surface. However, as can be observed in (17a-c), there are adjacent aspirated consonants in well-formed Kashaya words. In (17a-b), adjacent aspirated consonants surface because of a higher ranked constraint which says that [asp] features of affixes must be faithfully parsed (FAITH-[asp]_{aff}). In (17c), another markedness constraint outranks OCP_[asp]. This markedness constraint has the effect of not allowing plain coda consonants (see Buckley 1994 for more details).

In short, the ranking FAITH-[asp]_{root} >> OCP_[asp] >> FAITH-[asp]_{aff} explains why Aspirate Dissimilation occurs in such a limited environment. Whenever an [asp] feature occurs in another context, it is required there either by faithfulness (17a-b), or by markedness (17c). Indexed faithfulness does not only explain differences in phonotactics between morphological and/or syntactic categories, but it is also capable of explaining why certain processes apply only in certain morphologically defined contexts.

3. Why not indexed markedness?

In the sections above it has been argued that morphosyntactically indexed faithfulness is capable of explaining phonotactic differences between morphosyntactic categories. It has also been argued to explain why certain processes have a limited scope of application.

One may now ask whether these facts could not just as well be accounted for in terms of indexed markedness constraints rather than in terms of indexed faithfulness constraints. The reason for preferring the indexed faithfulness constraints is that they allow a more intuitive treatment of the data. This can be illustrated by reconsidering the data from Dutch that were discussed in section 1.1. above.

Recall that in Dutch nouns, verbs and adjectives differ from prepositions in that the former do allow complex margins while the latter do not. There are basically two ways to account for this distribution in terms of indexed markedness constraints. First, we might assume that there is an indexed markedness constraint that says ‘lexical words must have complex margins.’ This constraint could be kept in check by another constraint saying that the input must be faithfully parsed.

The faithfulness constraint would have to be ranked above the markedness constraint, otherwise all lexical words would have complex margins, which is at odds with the reality of Dutch. With the faithfulness constraint over the indexed markedness constraint, the fact that a word might lack a complex margin must be due to a faithfully parsed underlying form. Turning to prepositions, difficulties arise with this account. Obviously, there would have to be a constraint requiring prepositions to have complex margins. Since no preposition has a complex margin, the constraint would have to be outranked by a faithfulness constraint requiring a faithful parse of the input. No input could have complex margins, since no output has complex margins and, given the high rank of the faithfulness constraint, all outputs would be faithful renderings of the input. The real question, which is why there would be no prepositions in the input with complex margins, remains unanswered, however.

The second way to use indexed markedness constraints to account for the difference between lexical and non-lexical words in Dutch employs a constraint saying 'do not have complex margins'. If the ranking were 'do not have complex margins- prepositions' >> Faith >> 'do not have complex margins- lexical words', there would be no prepositions with complex margins, whereas lexical words might have complex margins. The constraint below Faith is irrelevant. The constraint against complex margins only applies to prepositions and for all other inputs the faithfulness constraint is the highest ranked constraint. In fact, it is hard to see how this ranking would differ from a morpheme structure constraint, which would say that in the set of morphemes there are no complex margins. However, one of the goals of Optimality Theory is to derive such statements from constraint ranking. In the theory presented in this paper, with markedness constraints which are ranked in between indexed faithfulness constraints, the difference between two morphosyntactic categories follows from the interaction of constraints.

In conclusion, there is something arbitrary about a theory based on indexed markedness constraints. One could, for instance, imagine a language in which there were two markedness constraints, one prohibiting high vowels in lexical words and another one prohibiting the segment *t* in non-lexical words. The relation between the phonologies of these word classes would seem to be arbitrary and such arbitrariness is never found in natural languages. The theory presented in this paper contrasts with the tentative analysis based on indexed markedness constraints in that it is capable of expressing the relation between the phonotactics of two word classes in one language. All in all, a theory based on indexed markedness constraints causes more problems than it solves, which is a bad omen for any theory.

4. Alternative approaches

The problem dealt with in this paper might find an alternative treatment. In this section, I will show that this treatment is less constrained than the proposal advanced here.

The different phonologies of prepositions and lexical categories in Dutch might be captured in terms of two different grammars. One grammar, which

would allow complex margins, would be applicable to lexical categories such as nouns, verbs and adjectives while another grammar would be applicable to prepositions. Such co-phonologies are very unconstrained and are not capable of explaining the relation between two morphosyntactic categories. In order to see this, consider the example given in the introduction. Lexical categories in German may begin with a voiced or with a voiceless coronal stop {t, d}. If non-lexical categories begin with a coronal stop, it must be voiced {d}. In a co-phonology approach, there would be two separate and distinct rankings to deal with this. In one phonology the constraints would be such that the set of coronal stops would be {t, d}, while in the other phonology only a {d} would be allowed to surface. The fact that one set is a subset of the other set is a coincidence in this approach. Since the co-phonologies are distinct, the differences between two morphosyntactic categories in one language need not be related to each other at all. In the approach defended here, markedness constraints are sandwiched between faithfulness constraints that pertain to different morphosyntactic categories. This ranking scheme, which has been called *Emergence of the Unmarked* by McCarthy and Prince 1994, results in one category being unmarked with respect to another category.

5. Conclusions

In this paper, a theory has been advanced which explains the phonotactic differences between different morphosyntactic categories. The theory presented here builds on ideas put forward in McCarthy and Prince (1994) and Ito and Mester (1998). McCarthy and Prince (1994) propose a general ranking scheme to capture the observation that different morphological categories may be distinguished in terms of markedness. Here it is observed that different morphosyntactic categories can also be distinguished in terms of markedness. Therefore, it is proposed that different morphosyntactic categories follow the same general ranking scheme: a markedness constraint, which is ranked between faithfulness constraints. The idea that faithfulness constraints can be indexed is taken from Ito and Mester (1998). Novel is the idea that faithfulness constraints can be indexed with morphosyntactic information. This not only explains phonotactic differences between different morphosyntactic categories, but it also makes it possible to define domains of application of certain phonological processes.

It remains to be seen whether all differences between different morphosyntactic categories can be explained in this way. However, the approach sketched here seems promising enough to pursue as a line of research.

Notes

- ¹ Beneficial comments, which have led to an improvement of both content and form, have been provided to me by Kirsten Brock and Caroline Féry and I would like to thank them both.
- ² Since no morphosyntactic feature theory is being proposed, the features in this paper are rather naive. They serve expository purposes only and no claim is being made concerning their validity in a full fledged theory of morphosyntactic features.
- ³ Except for *rond*, which only allows verbal compounding (*rondlopen*, *rondvaren*).
- ⁴ Sometimes, due to the phonology of a language, it may not be so clear that there is a set subset relation between two morphosyntactic categories. In English, for example, lexical words may not start with voiced interdental fricatives and articles may not begin with a voiceless interdental fricative. This seems like a case of morphological complementary distribution and not a set subset relation. However, in related languages such as Dutch and German there is a set-subset relation of what is historically the same sound in the same environment. Moreover, the relationship between voicing and fricatives in Germanic languages is complicated. It seems to me that a better understanding of the phonology of voicing and fricatives will clear this matter up. It will not be pursued here, since it will take us too far afield.
- ⁵ All data in this section are taken from Buckley 1994.

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