Phonology and Morphology of the Germanic Languages

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Prosodic choices and the Dutch nominal plural[1]

1. The problem

Unlike both English and German,[2] Dutch has two productive and competing plural suffixes for nouns: -s and -en ([ən], often realized as {ə} in standard pronunciation). Examples:[3]

(1)		boek	boeken	'book'
(2)		vader	vaders	'father'
(3)		opa	opa's	'granddad'
(4)	a.	toekan	toekans	'tucan'
	b.	kanón	kanónnen	'gun'

In this paper, we will first discuss the conditions for adding the suffixes -s or -en. We will claim that these conditions are prosodic, both globally and in considerable detail. At the same time, choice of -s rather than -en is also a stratal feature of Dutch morphology. Next, we will compare the distribution of plural suffixes with the conditions on the choice of diminutive suffixes in Dutch nouns, and draw a conclusion about the morphological status of plural formation and diminutive formation.

Our claim will be that plural formation, to a large extent, is a matter of output conditions. However, we will not present a formal analysis of constraints and constraint ordering, but rather concentrate on the nature and the interaction of the conditions involved.

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[2] On first sight, -s plurals have a marginal position in German, occurring in a few paradigms such as Opa - Opas, 'granddads', and in loanwords, truncations etcetera: Café - Cafés, 'bars' and Sozi - Sozis, 'socialists' (data from Neef (1997)). For arguments that, nevertheless, -s may be the default plural suffix, see Clahsen a. o. 1995.

[3] Unless otherwise indicated, stress in the examples is initial. In Dutch orthography, long vowels in open syllabes are written with a single letter (vader); short vowels are written with a single letter in closed syllables (toekan, kanónnen). Furthermore, *oe* stands for /u/, *ie* for /i/, and both *ij* end *ei* for the diphthong /ɛi/.

2. A first generalization

Comparison between the plural forms of the common native words in (1)-(3), above, leads to the following tentative generalization:

(i) Plurals have -s if the base ends in a trochaic foot; if not, plurals have -(e)n.

Condition (i) is in conformity with the generalization found in many descriptions of Dutch - but not quite. Usually, it is said that -s is added when a noun ends in a syllable that does not carry stress.[4] We will try to show that it is foot formation rather than stress that determines the choice between -s and -en. For this purpose, we will, first of all, discuss more details of the native vocabulary.

2.1. In the native vocabulary, exceptions to the generalization given in (i) are few as far as monosyllabic words are concerned. Only a handful monosyllabic words that end in consonants take -s rather -en in the plural, for instance, kok - koks, 'cook', and maat - maats, 'companion' (which has an alternative plural maten). Plurals such as pak - *paks, 'package', or kop - *kops, 'head', are definitely impossible. It is, therefore, remarkable that monosyllabic loanwords that end in consonants, either from the large Romance Vocabulary of Dutch or from other languages, easily and preferably take -s plurals: bal - bals, 'dance party' (vs. [+native] bal - ballen, 'balls'), club - clubs, 'id.', Mig - Migs, 'id.', stop - stops 'id.' (vs [+native] stop - stoppen, 'plug'). This leads to a second, and also still tentative generalization:

(ii) Monosyllabic [-native] words take -s plurals

We will have ample opportunity to come back to the way in which conditions (i) and (ii) interact and compete. For the moment, the conclusion is warranted that the choice between the suffixes -s and -en is also determined by stratal features of the lexicon, which, as we will see, considerably complicates the picture.

2.2. A separate class of words that form exceptions to (i), above, are monosyllabic words and words with final stress that end in a full vowel. The [+native] vocabulary does not have many of these, and some of those have irregular plurals. But, as a rule, such words take -s plurals when they end in [a], [o], or [u] and -en plurals only when they end in diphthongs or in front vowels. Examples:

[4] For instance, Booij and van Santen (1995). Booij (1997) uses a formulation that is closer to ours. Notice, incidentally, that Dutch never developed alternants of -s like in English hous -houses; after stems ending in [s] or [z] the plural suffix is always -en.

(5) a.	pa	[a]	pa's		'dad'
	po	[o]	po's		'bedpan'
	knie	[i]	knieën	[knijən]	'knee'
	reu	[ö]	reuen	[röjən]	'male dog'

The [-native] words of this type follow the same pattern:

(5) b.	tabóe	[u]	tabóe's		'taboo'
	cadéau	[o]	cadéau's		'present'
	genié	[i]	geniéën	[ʒəníjən]	'genius'

Since condition (i) predicts that monosyllabic words have -en plurals, it appears that the application of (i) is preempted by the following more specific condition:

(iii) 'Avoid hiatus'

Condition (iii) is, actually, a general condition on the surface form of Dutch words, the details of which have been described in Zonneveld (1978). For our purposes, it suffices to observe that monosyllabic words as well as polysyllabic words with stressed final syllables, have plurals in -en when they end in the glides /j/ or /w/ or in one of the diphthongs [ɛi], [au], [ʌü] ((5c)). A stated above, words ending in a single long vowel sometimes also have plurals in -en). Here, the choice is determined by the nature of the vowel: -en plurals are found in words ending in the front vowels [i], [e], [ü], [ö] ((5d)). But notice that not a few loanwords ending in a front vowel still have plurals in -s ((5e)). That seems to indicate that the generalization (iii) about the [-native] vocabulary also refers to polysyllabic words ending in stressed syllables.

(5) c.	haai	[j]	haaien	[hajən]	'shark'
	vrouw	[w]	vrouwen		'woman'
d.	zee	[e]	zeeën	[zejən]	'sea'
	idée	[e]	idéeën		'idea'
	genie	[i]	genieën		'genius'
e.	logé	[e]	logé's		'guest'
	bougíe	[i]	bougíes		'sparkplug'
	menu	[ü]	menu's		'menu'

2.3. With a few exceptions, words ending in schwa take -s plurals in both vocabularies:

(5) f.	boete	boetes		'fine'
	garáge	garáges		'id.'

The other option is a plural form in -n, and since both boetes and boeten would be perfect trochees, condition (i) cannot make a prediction here about the choice of the plural ending. The preference for -s plurals in this type of word should rather be interpreted as a morphological condition: 'Plurals should be marked'. The general tendency in the standard language to drop final -n would make *boeten* PLUR indistinguishable from *boete* SING.[5]

3. Polyllables and trochaic form

3.1. So far, the descriptive evidence confirms that Dutch plural formation is subject to the conditions (i) - (iii), where (ii) and (iii) constrain (i). In polysyllabic words ending in consonants, however, the situation is more complex.

An important class of counterexamples to (i) are polysyllabic native words with an unstressed final syllable which contains a full vowel followed by a consonant. Such words have plurals in -en, also when the base is trochaic. This is true, first, for all words ending in the rhyme -ing, irrespective of whether -ing is (part of) a morpheme or not. Secondly, it is true of a small group of other words ending in consonants that have a short vowel or sometimes even a long vowel in the final syllable. Examples (where + indicates a morpheme boundary):

(6) a.	haring	haringen	'herring'
	won + ing	won + ingen	'house'
	leer + ling	leer + lingen	'pupil'
b.	leeuwerik	leeuweriken	'lark'
	havik	haviken	'hawk'
	schaduw	schaduwen	'shadow'
	lichaam	lichamen	'body'

These words sharply contrast in their plural formation with the frequent type of word with schwa in the final syllable. Apart from a few exceptions or alternative plurals in a more literary style, such words never have -en plurals in the modern language:[6]

[5] The exception are words like blind + e, 'blind person', derived from the corresponding adjectives with a suffix -e. These always take an -n plural: blinden, 'blind persons'. The same applies to nouns formed on the basis of past participles like gewond, 'wounded', gewond + e, 'wounded person', plural gewonde + n, 'wounded persons'.

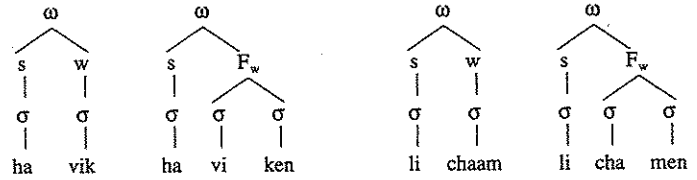
[6] German words of the type Wagen, 'car', often have plurals with 0-endings and sometimes Umlaut; in Dutch, such words always take an overt plural ending -s, irrespective of grammatical gender.

(7)	wagen	wagens	'car'
	lepel	lepels	'spoon'
	bakk + er	bakk + ers	'baker'
	bodem	bodems	'bottom'

Prosodically, the words exemplified in (6a) and (6b) are peculiar because they form a trochee with a non-reduced vowel in the final syllable, followed by a consonant (or even a cluster, as in the case of avond, 'evening', plural avonden). In this respect, they constitute the Dutch counterpart of words undergoing the 'Arab rule' in the stress pattern of English.

We therefore assume that, in the [+native] vocabulary, a full vowel cannot occupy the weak branch of a foot. Hence, the weak syllables in (6) form a foot head instead, leading to the following structures:

(8)

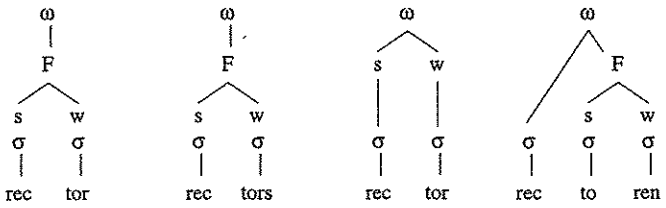


However, what happens in words like havik is not what happens with [-native] words of the same prosodic type. Polysyllabic words ending in obstruents like bivak, 'bivouac', kajak, 'id.', and almanak, 'almanac', and also words ending in sonorants like toekan, 'tucan', radar, 'id.', horizon, 'id.', and festival, 'id.', normally take -s plurals. So here, the two vocabularies diverge since in [-native] words a full vowel *can* occupy the weak branch of a foot.

There is a small class of exceptions that corroborate the prosodic analysis proposed above in an interesting way. A number of [-native] words with prefinal stress and a final syllable with a short vowel followed by a sonorant consonant can also have a plural in -en. Next to eléktron - eléktrons, 'id.', and rector, 'rectors', 'id.', we also have eléktron - elektrónen, and rector - rectóren, where stress shifts to the penultimate syllable, with concomitant lengthening of the vowel. That is, if the parsing is as in (9)a, below, the plural forms preserve the trochaic structure of the base form. If the parse is as in (10)b, with the final syllable not integrated, plurals are formed by adding -en and the formation of an additional foot.[7]

[7] Booij (1997) takes the position that alternative stems such as elektroon-, motoor- (which als occur in adjectival formations) should be listed as allomorphs. This question we will not discuss here.

(9)



3.2. From these cases especially, it is clear that a generalization that is primarily based on the location of stress is not adequate. Wagen and woning, and bivak and havik have the same stress pattern, but different plurals. Therefore, we maintain that plural formation in nouns is, first of all, determined by foot structure. Formulated in terms of output conditions, Dutch seems to prefer plurals that preserve a trochee at the end of the word. At the same time, prosodic preferences are sometimes overridden by features of the lexicon and the morphology, in particular, the stratal feature [-native]. We saw earlier that [-native] monosyllabic words ending in a consonant prefer plurals in -s. A similar remarkable difference between the two vocabularies can be observed in the plural formation of a number of polysyllabic [-native] words with final stress. While condition (i) would predict an -en plural, many polysyllabic words of this type unexpectedly take -s rather than -en. Some typical examples of bisyllabic words of this type are given in (10a); examples of the same type of word with an -en plural are given in (10b).

(10)	a.	hotél	hotéls	'id.'
		balkón	balkóns	'balcony'
		pastóor	pastóors	'parish priest'
	b.	barón	barónnen	'baronet'
		kanón	kanónnen	'gun'
		kantóor	kantóren	'office'

The distribution of -s and -en in this category is largely unpredictable. Since, under any prosodic analysis, whether primarily based on stress or on foot structure, plurals such as balkón - balkóns are 'wrong', the reasonable conclusion is that the tendency for [-native] words to have plurals in -s is a true stratal feature of the lexicon and that plural formation is one of the features that mark the Dutch [-native] vocabulary as such.[8] Like we saw earlier in some examples of polysyllabic words ending in front vowels, words ending in sonorant

[8] We use the feature [stratal] in the sense of Itô and Mester 1995. It would apear that their tripartite division of the Japanese vocabulary into Yamato, Foreign and Assimilated foreign, by and large corresponds to [+native], [foreign] and [-native] in Dutch. Interestingly, whereas words like agént - agénten have -en plurals, words that are more or less pronounced as if they were French, like expért, [ɛkspé:ʁ], 'id.', take -s plurals: expérts [ɛkspé:ʁs], not *expérten.

consonants also take -s rather than -en. However, -s plurals do not occur in polysyllabic loanwords ending in obstruents or clusters of sonorant and obstruent:

(10)	c.	florét	floréttten	'fencing-sword'
		patát	patátten	'french fried'
		talént	talénten	'id.'
		ag + ént	agénten	'id.'
		debut + ánt	debutánten	'id.'

The same unexpected -s in loanwords with final stress turns up in some words with suffixes that are [-native], of which Dutch has quite a few. Generally, affixed words follow the general pattern of plural formation in monomorphemic words in both vocabularies (Booij and van Santen 1995:67), but there are some exceptions. For instance, a number of words with the [-native] suffixes -eur and -ier that form names of persons have plural froms with -s. These words, examples of which are given in (10d), are in clear contrast with the examples of suffixed words in (10e) and with the non-suffixed words in (10f):

(10)	d.	bank + iér	bankíers	'banker'
		regiss + éur	regisséurs	'movie director'
	e.	Arab + íer	Arabíeren	'Arab'
		Marokk + áan	Marokkánen	'Maroccan'
		Rom + éin	Roméinen	'Roman'
	f.	rivíer	rivíeren	'river'
		platáan	platánen	'plane-tree'
		koníjn	koníjnen	'rabbit'

But here too, -s plurals are the exception; the examples in (10e) and (10f) follow the general pattern that word stems ending in a superheavy syllable with long vowel followed by consonant take -en plurals.

3.3. We can now summarize the main conditions for plural formation in the following way ($]_{St}$ is right edge of the Stem, $]_{st}$ is right edge of the word).

(v) *F $]_{st}$ +en

(vi) *s/z $]_{St}$ +s

(vii) *V$]_{St}$ +en

(viii) *F]$_{St}$ +en [-native]

σ

(ix) *F]$_{St}$ +en [-native]

σ σ

V C

[+son]

The general condition is (v): if the word stem is a trochee at the right hand edge, the plural suffix to choose is -s. The specific conditions that restrict (v) are (vi) and (vii). These are valid for both vocabularies: stems ending in /s/ or /z/ do not have -s plurals; stems ending in full vowels do not take -en plurals in the unmarked case.

The formulation of condition (v) excludes the unbalanced trochees in [+native] words like havik, where the final syllables are parsed as separate feet. Condition (v), however, includes [-native] words like bivak and radar which take an -s prulal. The conditions (viii) and (ix) state that native words predominantly take an s-plural when monosyllabic, and when polysyllabic if the last syllable is stressed and ends in a sonorant consonant.

The two latter conditions replace the tentative generalization expressed in (ii), above: whereas there are categeories of [-native] words that unexpectedly take -s plurals, there are also types of loanwords (floret, Arabier) that regularly take a plural in -en.

This summary statement, to be sure, disregards a number of details and exceptions that were amply discussed above. We believe, however, that is gives a fair picture of the main tendencies and, especially, that is adequately summarizes both the convergence and the divergence of the two strata in the Dutch lexicon as far as plural formation is concerned.

4. Plurals and diminutives

4.1. Rather than going into more details of the formation of plurals, we would next like to discuss the relation between diminutive formation and plural formation, and draw some conclusions about the interaction of phonology and morphology.

Plural formation, as we have seen, is sensitive to both prosodic structure and to features of the lexicon and the morphology. More specifically, plural formation also generalizes over morphological and lexical categories. But that is not true, or to a much lesser extent, for the other process of word formation in Dutch that is highly sensitive to prosody, namely, diminutive formation. We will only discuss words ending in sonorant consonants here, since for words ending in obstruents and vowels, the situation is simple. Words ending in an obstruent have the diminutive ending -je, with only few exceptions, words ending

in full vowels take -tje, usually regarded as the underlying or basic form. The alternations that are relevant to our purposes are exemplified in (11), below:

(11)

	STEM	DIMINUTIVE	PLURAL	GLOSS
a.	bal	balletje		ball
	taal	taaltje	-en	language
	ring	ringetje		ring
b.	haring	haringkje		herring
	woning	woninkje	-en	house
	wandeling	wandelingetje		walk
	leerling	leerlingetje		pupil
c.	toekan	toekannetje		tucan
	motor	motortje	-s	engine
	festival	festivalletje		festival
d.	bacíl	bacílletje		bacillus
	tonéel	tonéeltje		stage
	bazín	bazínnetje	-en	boss FEM
	konijn	konijntje		rabbit

4.2. As the examples in (11a) show, diminutive formation is, first of all, sensitive to the moraic structure of the rhyme, plural formation is not. Bal and paal have the same plural but not the same alternant for the diminutive. The examples in (11b) show that diminutive formation is also sensitive to details of stress assignment. Words like haring take -tje, but words like wandeling, with secondary stress on the final rhyme, take -etje, just like bal in (1). Plural formation in the [+native] vocabulary disregards such differences; all words ending in -ing have -en plurals, irrespective of the details of their prosodic structure.

Interesting here is the example toekan in (11c). According to most analyses in the literature, a secondary stress on the final syllable, -kan, triggers diminutive formation with the suffix -etje rather than with -tje. More generally, words ending in -Vr, like motor, radar, will take -tje, whereas words ending in -Vn prefer the long alternant -etje. For the purpose of plural formation, however, these [-native] words are generally parsed as trochees: motors (but sometimes: motóren) and toekans rather than toekannen. Where plural formation and diminutive formation do coincide, however, is in the category of [-native] words with final stress, where, with the exception of words like balkón - balkóns, discussed earlier, the plural suffix is -en and the diminutive has the long form -etje and not -tje. The examples in (11d) again show that vowel quality overrides stress in diminutive formation: bacíl, with a short final vowel, selects -etje, but tonéel, with a long vowel, does not.

This confirms, first of all, the position taken in Trommelen 1983 that diminutive formation is a 'local' process. More specifically, it is sensitive to details of stress assignment that

have not yet been spelled out when plural formation applies. This, we think, is an important conclusion because it shows that word forms do not necessarily have one, uniform prosodic shape at different levels of word formation. On the interface of phonological and morphological structure in Dutch, plural formation is an 'early' process that is sensitive to some aspects of the prosody but also to morphological category and stratal features, whereas a process such as diminutive formation is a late, postlexical process that is sensitive to details of prosodic and segmental structure, and not to morphological category; also, stratal features like [-native] do not play any role.

5. Conclusion

Our most important goal in this paper has been to show that the formation of Dutch nominal plurals is constrained by only a few prosodic conditions that interact in a complicated way. First of all, the basic condition, which we summarized as 'form a trochee at the right edge' has different consequences for the [+native] and for the [-native] vocabulary. Second, the [-native] vocabulary is, to an extent, subject to an independent and non-prosodic constraint: 'form plurals with the suffix -s'. In order to be able to focus on the cases where the vocabularies converge, we have assumed that -s plurals are a stratal feature of the language, rather than introducing the notion of 'co-phonologies'.[9] This also ties in with our claim that plural formation, unlike diminutive formation, is an early rule, at the lexical level, and therefore subject to morphological categorization.

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[9] For critical discussion of co-phonologies, see Inkelas, Orgun and Zoll (1997).

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