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The Dutch diminutive

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Abstract

In this paper a new analysis is presented of the allomorphy of the Dutch diminutive suffix. There is one long allomorph (*-etje*) and four short allomorphs (*-tje*, *-pje*, *-kje* and *-je*). With respect to the choice between the long and short versions, this article compares two types of analyses, which appeal to the structural organisation of the stem (rather than to the segmental properties of the stem). In the first type, the allomorphy is accounted for with reference to the foot structure of the stem, while in the second the allomorphy is accounted for with reference to the syllabic structure of the stem (specifically the final rhyme). The two types of analyses are developed in order to account for all relevant data and it is decided that the syllabic analysis must be chosen if is assumed that the tense (allegedly 'long') vowels are structurally short, an assumption that is supported by their behaviour with respect to stress (for which purpose they count as light). The article then offers a non-derivational account of the choice between all forms of the suffix, including the short forms.
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1. Introduction

The Dutch diminutive suffix displays a rich variety of allomorphs whose distribution has challenged almost all Dutch and even a number of non-Dutch phonologists for decades, if not centuries. We can identify various traditions in previous accounts. After a few early explorations (van Ginneken, 1934; Kruisinga, 1915; te Winkel, 1862; among others), we find the first full statement of what seem to be the relevant factors in Cohen (1958), who shows that the choice of the proper allomorph is largely governed by the shape of the final syllable of the base, including the type of vowel and final consonant of this syllable, although stress and morphological structure are also mentioned as relevant factors. Following the work of Cohen, we find three types of

analyses (as well as mixtures of these types), (a) one which formalises the entire variety of apparent factors in generative rules, including, especially for the choice between the long form (*-etje*) and the short forms *(-tje, -pje, -kje, -je)*, reference to the types of vowels and final segments of the base-final syllable, stress and morphological structure (see for example Haverkamp-Lubbers and Kooij, 1971), (b) one in which this choice is mostly attributed to the *prosodic structure* of the base (in particular the difference between branching or non-branching structure at the syllable and foot level) (see for statements of such an account Ewen, 1978; Kooij, 1982; Lowenstamm and van der Wilt, 1982; van Voorst, 1983)[1] and (c) one in which the crucial, if not the only factor is thought to be the structure of the final rhyme of the base without any reference to stress factors and no or minimal reference to segmental properties of the base (van der Hulst, 1984; Trommelen, 1983). An overview of most of these accounts can be found in Trommelen (1983), herself the most consistent proponent of the third approach. While some of the analyses are carried out in specific versions of generative phonology (e.g. Ewen, 1978 uses the Dependency Phonology model and Robinson, 1980 Upside Down Phonology), others use more widely accepted versions of linear or non-linear generative phonology. Some analyses use (sometimes extrinsically ordered) rules that derive all allomorphs from one unique underlying form (usually *-tje*), while others adopt an 'item-and-arrangement' perspective in which the different allomorphs are selected in the appropriate environment (e.g. van der Hulst, 1984; van Zonneveld, 1978).

In this article we re-examine some of the previous analyses of types (b) and (c) in an attempt to make some small improvements to the latter type of analysis, which we will argue to be the correct one. We cannot offer a thorough discussion of all the relevant post-1983 analyses here, and focus on representatives of the various 'structural' analyses. Our own frame of reference is Head-driven Phonology (van der Hulst and Ritter, 1999, 2002, in preparation), which gives an account of phonological structure and variability (i.e. alternations) in terms of a non-derivational, constraint-based model in which severely limited syllabic structures, as well as head-dependency relations, play a key role in accounting for phonological phenomena.

In section 2 we present the basic facts, while sections 3–5 develop, as far as possible, an approach that refers to foot structure only (the ultimate goal of approach (b)). Realising that a complete foot-based (or, for that matter, a mixed metrical-syllabic) account is not feasible, in section 6 we switch to an account which, like Trommelen's (1983) analysis, makes exclusive reference to the structure of the final rhyme (the ideal form of approach (c)). However, we criticise the syllabic assumptions that Trommelen has to make to uphold this type of analysis, while showing that it can nonetheless be maintained, because within the context of Head-driven Phonology less arbitrary syllabic structures can be postulated. The resulting analysis incorporates some ideas from the mixed syllabic-segmental analysis proposed in van der Hulst (1984) and some claims about rhyme structure advanced within the model of Government Phonology (Kaye et al., 1990; Ritter, 1995). In section 7 we consider additional data showing the relevance of secondary stress, and explain how we can account for this relevance without actually referring to stress directly, while section 8 presents our view on the lexical representations of the suffix, as well the way in which the various short forms (*-tje*, *-pje*, *-kje*, *-je*) are selected. In section 9, we check whether our overall analysis is consistent with the way stress in Dutch has been analysed,

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[1] Lowenstamm and van der Wilt (1982), an unpublished and not widely circulated draft, as well as Kooij (1982) and van Voorst (1983), employ a non-linear generative framework, whereas the account in Ewen (1978) proposes a structural generalisation over intrasyllabic and suprasyllabic structure, couched in a dependency framework.

and in section 10 with accounts of the distribution of superheavy syllables. Finally, in section 11, we present our conclusions.

2. The data

Ignoring stress for the moment, let us first consider the basic patterns (see Cohen, 1958; Haverkamp-Lubbers and Kooij, 1971; van der Hulst, 1984; Kooij, 1982; Kooij and van Oostendorp, 2003:165–172; Trommelen, 1983)[2]:

(1)   a.   Short vowel + sonorant   -$\partial t^j \partial$ (the 'long form')[3]

bal	ballón	balletje	ballonnetje
kar	madám	karretje	madammetje
kan	wígwam	kannetje	wigwammetje
kam	bízon	kammetje	bizonnetje
tang	sátan[4]	tangetje	satannetje
	kartón		kartonnetje

    b.   Long vowel/diphthong   -$j\partial$ (the 'short form' without obstruent)
        + obstruent

baas	huis	baasje	huisje
slaap	kuip	slaapje	kuipje

    c.   Short vowel + obstruent   -$j\partial$ (the 'short form' without obstruent)[5]

bus	kadét	busje	kadetje
kat	marmót	katje	marmotje
pak	sórbet	pakje	sorbetje
dop	hárnas	dopje	harnasje

    d.   Long vowel   -$t^j\partial$ (the short form with obstruent /t/)

zee	dóminee	zeetje	domineetje
kadó	tóga	kadootje	togaatje

    e.   Schwa   -$t^j\partial$ (the short form with obstruent /t/)

type	lente	typetje	lentetje

    f.   Diphthong   -$t^j\partial$ (the short form with obstruent /t/)

ei [ɛɪ]	touw [ɑʊ]	eitje	touwtje
ui [œɪ]		uitje	

---

[2] We present examples in orthographic form and omit glosses. Vowels in closed syllables are 'short', unless written as a geminate or digraph. Vowels in open syllables are 'long', and, when final, are sometimes orthographically geminate. Double consonants occur after short vowels, and represent 'ambisyllabic' consonants or 'virtual geminates'. <ng> stands for the velar nasal. The notation C^j represents an obstruent (with secondary palatalisation) which agrees in place with the preceding nasal. Where crucial we indicate stress, which is not represented in the orthography.

[3] We assume that the /j/ in the suffix appears as a secondary articulation on the preceding obstruent consonant. /j/ often merges with /t/ to form a palatal consonant [c] (Lahiri and Evers, 1991), but we do not represent that here.

[4] There is some variability in forms with initial stress, in that some speakers find *wigwampje*, *bizontje* and *satantje* acceptable; cf. van der Hulst (1984:128–129); Trommelen (1983:47–49); see section 7.

[5] There are some words that take the long form: *kippetje*, *bruggetje*, and a few others, all ending in a non-coronal. A few other cases take an unexpected stem, with a long vowel: *dag – daaagje, schip – scheepje*. This long vowel stem also occurs in the plural of these nouns. In all cases, the exceptional form, which is more common, usually exists alongside the regular form.

g.	Long vowel + sonorant		-Cʲə (short form with homorganic obstruent)	
	baal	duim	baaltje	duimpje
	laan	veer	laantje	veertje
h.	Long vowel + approximant		-tʲə (short form with obstruent /t/)[6]	
	zooi	leeuw	zooitje	leeuwtje
	duw		duwtje	
i.	Short vowel + two sonorants		-Cʲə (short form with homorganic obstruent)	
	arm	kern	armpje	kerntje
j.	Other forms ending in an obstruent		-jə (short form without obstruent)	
	kast	vent	kastje	ventje
	wesp	vriend	wespje	vriendje
	fiets	beeld	fietsje	beeldje
	kamp		kampje	
k.	Schwa + sonorant consonant		-Cʲə (short form with homorganic obstruent)	
	bódem	bákker	bodempje	bakkertje
	háven	lépel	haventje	lepeltje
	kóning		koninkje	
l.	Schwa + obstruent		-jə (short form without the obstruent)	
	hánnes		hannesje	

(2) Generalisations
   a. after short *stressed* vowels followed by a sonorant consonant: [-ətʲə] (1a)
   b. after final obstruent: [-jə] (1b, 1c, 1j)
   c. elsewhere [-pʲə] after /m/, [-kʲə] after /ŋ/, [-tʲə] in all other cases

In (1a, c, d) we have included some examples with different stress patterns, which do not seem to affect the choice of allomorph (but see note 5). In (1k, l), where the stressed syllable is followed by a 'schwallable' (a syllable with a schwa, the unstressable vowel in Dutch), stress, or at least foot structure, does seem to play a role. There are additional data that show the relevance of stress, and some related complications, which we will introduce in section 7.

3. The relevance of branching structures

In this section we will focus on the approaches that seek to account for the choice between the long form and short forms (ignoring the factors that determine the choice of the different short forms) by appealing (partially or entirely) to some sort of 'generalised' *structure*, which is instantiated in either the foot or the syllable. Lowenstamm and van der Wilt (1982), Kooij (1982) and van Voorst (1983) propose such 'metrical analyses', attributing the choice between the short and long form to the presence of a branching structure of the base (at the

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[6] Isolated exceptions: *wieletje, bloemetje* (which exist alongside the regular forms *wieltje, bloempje*). The usual 'explanation' is that the high 'long' vowels [i y u] are fairly short.

foot or the syllabic level), while Ewen (1978), using Dependency Phonology, does the same, analysing the factors governing the choice between the short and long form in terms of a dependency organisation. The central idea in these analyses is that the *short* form is selected when there is a preceding branching structure, either at the foot level (*lepel-tje*; (1k)) or syllable level (*laan-tje, urn-tje*; (1g–i)), while the long form occurs if the preceding structure is non-branching (*kam-etje*; (1a)). Some studies focus on the foot factor more than on the syllabic factor because they do not present a complete account.[7] The insight that is captured in these approaches is that the appearance of the extra 'epenthetic' schwa-syllable in the long form of the suffix compensates for the 'shortness' of the stem-final foot and that, overall, some sort of 'canonical structure' or 'template' in which a branching structure precedes the *tje*-part of the suffix forms an 'output condition' for diminutives; if the branching structure is present in the stem, *-tje* can be added, but if the relevant part of the stem is non-branching, the extra schwa provides the branching structure that precedes *-tje*.

Let us develop this branching hypothesis further, trying to take into account *all* the facts, as well as Government Phonology style proposals about syllabic organisation.[8] In doing so, we will try to remove the disjunction 'foot or syllable', and explore whether all relevant structure can be located in the foot structure. This means that we do not follow any of the earlier analyses other than 'in spirit'. Recall that in this section we will not talk about the choice between the various short forms: *-je* after obstruents (*huis-je*; (1b)), *-pje* after a labial nasal (*raam-pje*; (1g)), *-kje* after a velar nasal (*koning-kje*; (1k)) and *-tje* elsewhere; these choices are discussed in section 8. As we will see, the 'branching' analysis works perfectly and, in fact, we can restrict reference to the notion 'branching foot' and eliminate reference to syllable structure, if we adopt the apparently straightforward idea that long vowels project a branching rhyme (i.e. are bipositional: *zee-tje*; (1d)), as do short vowels when followed by a sonorant (*kam-etje*; (1a)). However, we must also adopt the somewhat less straightforward claim that obstruents following short vowels are not syllabified as codas, but rather as onsets followed by a silent vowel (*ka-t∅-je*).[9] But, before we address these cases, let us first look at the more obvious candidates for this foot-only analysis.

The relevance of foot structure is particularly evident in bisyllabic forms that have a schwa in the second syllable (*bodem-pje*; (1k, l)), because these stems clearly form a branching foot, while taking the short form[10]:
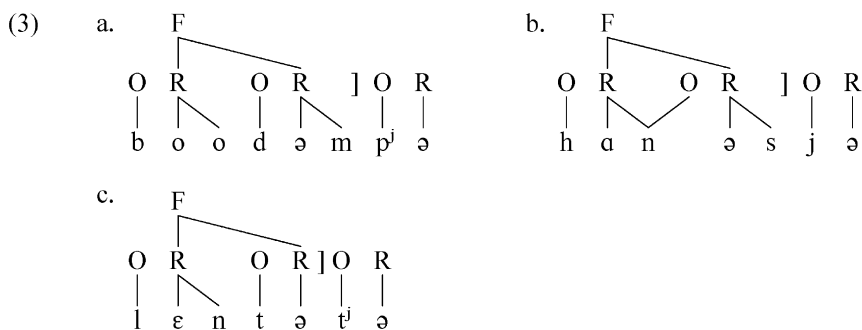
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[7] Ewen's account is limited to words ending in a liquid or nasal. Thus his analysis does not contain a proposal for making a structural distinction between *kat* and *kam*, or words ending in a vowel (*zee*). The proposal by Lowenstamm and van der Wilt also does not deal with the *zee* case. Van Voorst's analysis acknowledges the insights in Ewen's analysis, and claims to arrive at a purely metrical analysis that makes no reference to the segmental nature of the stem-final segment, although it is unclear how he prevents the long form after a stressed vowel-final stem (which would end in a non-branching foot).

[8] As we will see, Head-driven Phonology postulates even more restrictive structures than Government Phonology, in that it eliminates the nucleus–rhyme distinction.

[9] Short vowels in Dutch (and in other Germanic languages) can apparently can only occur when immediately followed by a consonant (because they need to be 'checked' by an immediately following consonant). Some (loan) words form exceptions: *schwa, relais, chalet*.
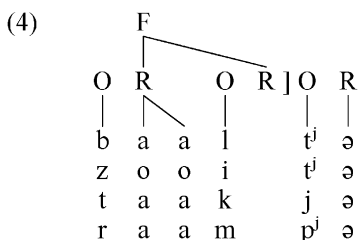
[10] For the time being we represent long vowels as two vowel symbols, i.e. as two skeletal slots associated to one vowel segment. However, most diagrams are simplified by leaving out the skeletal tier.

The doubly linked /n/ is a 'virtual' geminate, representing the so-called ambisyllabic consonants of Dutch, which only occur after short vowels. As we will see, its existence is not contrastive in Dutch; cf. van der Hulst (1985, 2003).
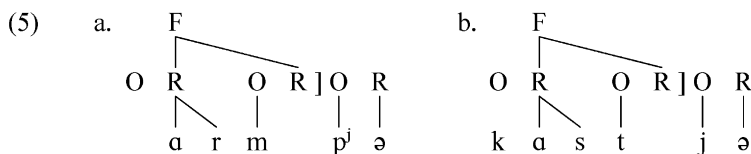
(3)   a.
```
              F
             /|\
      O  R    O  R  ] O  R
      |  /\   |  /\   |  |
      b  o o  d ə  m  pʲ ə
```
b.
```
              F
             / \
      O  R    O  R  ] O  R
      |  /\   |  \/   |  |
      h  ɑ n  ə  s    j  ə
```

c.
```
              F
             /|
      O  R    O  R ] O  R
      |  /\   |  |  |  |
      l  ɛ n  t  ə  tʲ ə
```

The nouns in (3c) that end in schwa (without a following consonant; (1e)) seem somewhat reluctant to accept a diminutive, but if they do, the form *-tje* is chosen, as expected.

Let us now turn to the case where the stem has a long vowel followed by a consonant or approximant (1g, h). We will follow the by now familiar idea (found in Government Phonology, but also proposed in other frameworks) that 'superheavy rhymes' are excluded as possible syllable types, which enforces a bi-rhymal analysis, with the second (i.e. final) rhyme being empty. Such an analysis is well motivated, because final superheavy syllables behave like branching feet (i.e. stress is final; cf. van der Hulst, 1984; Kager, 1985, 1989; Langeweg, 1988; Zonneveld and Trommelen, 1999), while it is also enforced by the exclusion in Government Phonology of 'ternary rhymes' (cf. van der Hulst and Ritter, 1999; Kaye et al., 1990; Ritter, 1995).

(4)
```
            F
           / \
    O  R     O  R ] O  R
    |  /\    |  |   |  |
    b  a a   l  tʲ  ə
    z  o o   i  tʲ  ə
    t  a a   k  j   ə
    r  a a   m  pʲ  ə
```
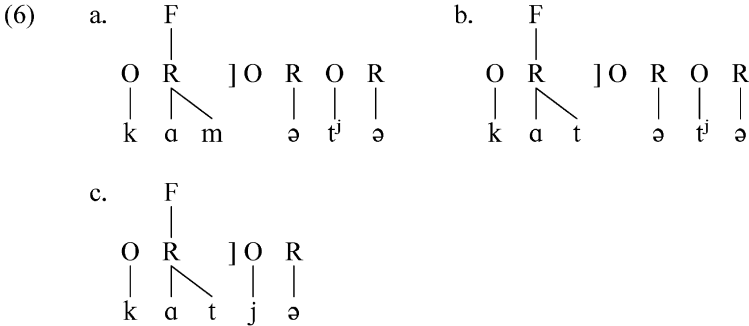
The approach here is similar to the case where a short vowel is followed by *two* consonants. In this case too, apparently superheavy final syllables have a bi-rhymal representation[11]:

(5)   a.
```
          F
         / \
    O  R   O  R ] O  R
    |  /\  |  |   |  |
    ɑ  r m pʲ  ə
```
b.
```
          F
         / \
    O  R   O  R ] O  R
    |  /\  |  |   |  |
    k  ɑ s t   j  ə
```

---

[11] An independent process deletes the stem-final /t/, so that the surface form is [kɑsʲə]. The final representation of this type of form is given in (21). There I also discuss some of the other forms in (1j); those with long vowels followed by two consonants also require more complex representations, but would still end in some sort of branching rhyme.

However, there are also a few cases, to which we now turn, which present problems. One type of case is illustrated by *katje*, where we would expect *kattetje* (cf. *kammetje*). In both cases, the monosyllabic stems *kat* and *kam* would appear to form a non-branching foot, yet we find different forms of the suffix[12]:
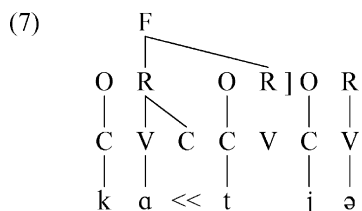
```
(6)    a.      F                          b.      F
               |                                  |
        O   R      ] O  R  O  R           O   R      ] O  R  O  R
        |   |\       |  |  |              |   |\       |  |  |
        k   a  m     ə  tʲ ə              k   a  t     ə  tʲ ə

       c.      F
               |
        O   R      ] O  R
        |   |\       |  |
        k   a  t     j  ə
```

Clearly, the well-formed representation in (6c) is incompatible with the idea that the short form occurs after a branching foot. To enforce a difference between *kam* and *kat* Lowenstamm and van der Wilt (1982) suggest that *kam* and *kat* have different syllable structures, arguing that the former has a branching nucleus, while the latter has a branching rhyme. Accordingly, the short form appears not only after a branching foot, but also after a branching rhyme. Our framework does not accept the nucleus/rhyme distinction (cf. van der Hulst and Ritter, 1999), so we cannot accept this solution. To account for the difference, while pursuing the same type of approach, we will also seek a solution in the idea that obstruents and sonorants syllabify differently. For us, the most 'natural' constraint allows sonorants to occur as codas, while barring obstruents.[13] This restriction is, in fact, claimed to be universal in the framework of Radical CV Phonology; cf. van der Hulst (2005a). To implement this idea we have to take into account the fact that short vowels in Dutch *must* be followed by a consonant. In van der Hulst (2003) it is suggested that such vowels (traditionally called 'lax') are *subcategorised* for the environment $[\_\_ C]_R$ (i.e. they must occur in a branching rhyme where the second unit is a C slot). This account explains why short vowels cannot occur word-finally and medially in hiatus (van der Hulst, 1985). The subcategorisation proposal seems to imply that the consonant that satisfies the frame (regardless of its type) must be in the same rhyme as the short vowel, but clashes with the constraint that obstruents cannot be codas. To solve this clash, what we need to assume in order to differentiate between sonorant consonants and obstruents, while adopting the idea that only sonorants can occur in coda position,[14] is that the subcategorisation requirement can be satisfied not only by having a consonant present in the coda, but also when the consonantal position can be interpreted through 'spreading' from the consonant in the following onset. We will assume that this spreading is an automatic effect of having an empty coda position:
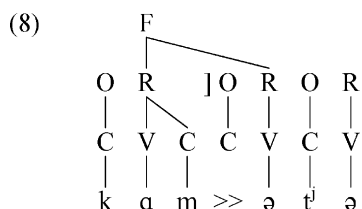
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[12] Note that there are exceptions in this class that do in fact take the long form (*bruggetje*).

[13] Botma and van der Torre (2000) propose a similar difference, which is adopted in the analysis of van de Weijer (2002).

[14] It would seem that the sonorants should not be /j/ or /w/, but one could argue that a diphthong is a sequence of a lax vowel + semivowel (cf. van der Hulst, 1984: 96); but see section 4.
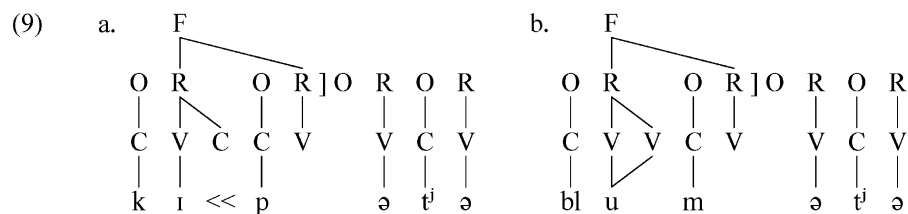
(7)

```
           F
        ___|____
       /   |    \
  O    R      O   R ] O   R
  |   /|      |   |   |   |
  C   V C     C   V   C   V
  |   |  \    |       |   |
  k   ɑ  << t         j   ə
```

The vowel [ɑ] is short and thus requires a C position within its rhyme. This position, being dependent and empty, must receive segmental content, which in this case comes from the following onset consonant because this consonant, when an obstruent, cannot occupy the rhyme slot.[15] Crucially, therefore there is no obstruent in the coda position in (7). Note that it is not unusual to allow obstruent geminates even when the coda position cannot contain a singleton consonant of the same type; Japanese, for example, allows only nasal codas, while at the same time having obstruent geminates. When the consonant following the short vowel is a sonorant, it can directly satisfy the subcategorisation frame.[16]

(8)

```
          F
        __|___
       /  |   \
  O    R    ] O   R   O   R
  |   /|      |   |   |   |
  C   V C     C   V   C   V
  |   |  \    |       |   |
  k   ɑ  m >> ə       tʲ  ə
```

By assuming that sonorants following a short vowel occupy the coda, we create the unusual situation that a single consonant that occurs between two vowels is not syllabified as an onset. One response is as follows. Let us say that an empty onset position (just like an empty coda position in (7)) is universally interpreted in terms of the consonantal melody that is within its scope. Phonologically, the /m/ in (8) remains part of the base syllable, while in (7) the /t/ is an onset segment. The net effect is that short vowels are always followed by a 'virtual' geminate (van der Hulst, 1985), except, predictably given our analysis, those followed by a sonorant in word-final position.[17]

Exceptional forms like *kippetje* (instead of *kipje*) and *bloemetje* (instead of *bloempje*) need to be listed in the lexicon:

(9)   a.

```
           F                                  b.        F
        ___|____                                     ___|____
       /   |    \                                    /   |    \
  O    R      O   R ] O   R   O   R        O    R      O   R ] O   R   O   R
  |   /|      |   |   |   |   |   |        |   /|      |   |   |   |   |   |
  C   V C     C   V   V   C   V            C   V V     C   V   V   C   V
  |   |  \    |       |   |   |            |    \ \    |       |   |   |
  k   ɪ  << p         ə   tʲ  ə            bl   u  m           ə   tʲ  ə
```

These representations are not ill-formed as such; it is just that the form of the diminutive suffix is not predictable in these forms.

It would seem then that we can maintain the spirit of the original Lowenstamm and van der Wilt, Kooij, van Voorst and Ewen analyses, while accommodating the unexpected choice of the short form in the *kat* case, by appealing to the fact that sonorants can syllabify into the rhyme, while obstruents cannot. In fact, we have eliminated a disjunction in these types of analyses, which refer to the notion branching foot *or* branching rhyme. We have removed all reference to the notion branching foot.

There is, however, one remaining problem for the analysis that appeals to branching foot structure only. When the stem ends in a vowel, which is necessarily long or a diphthong, the schwa is not expressed:

(10)
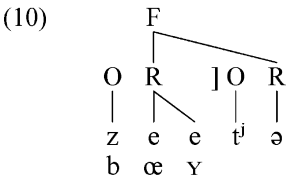
Observe that this case is problematic for the account developed by Lowenstamm and van der Wilt, because we would expect that long vowels would project a branching nucleus, just like short vowels followed by a sonorant.

To explain that bases ending in a long vowel act like bases ending in a short vowel followed by an obstruent, a long vowel or diphthong would have to project a *branching rhyme structure*, like *kat* (11b). But this would be inconsistent in the approach taken by Lowenstamm and van der Wilt, given that they crucially adopt the idea of a branching nucleus, which surely would apply to long vowels:

(11)   a. F   b. R   c. N

        short   short   long
   (*bodem*, *ar.m∅*)   (*kat*, *zee*)   (*kam*)
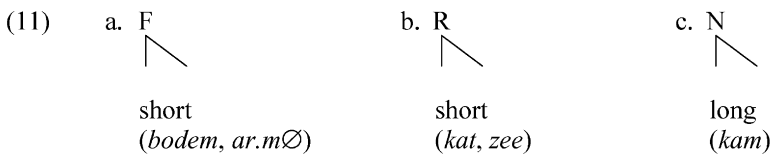
And even if Lowenstamm and van der Wilt were to treat *kat* as a branching foot (cf. (7)), we would still have the problem of treating long vowels as branching rhymes and short vowel + sonorant sequences as branching nuclei. If the two behave differently, we would expect the reverse representations, leading to the generalisation that the short form occurs after a branching foot or a branching nucleus, but there would then be no motivation for a branching rhyme to select the long form.

What else can we do to maintain the foot-only analysis? An obvious solution seems to be to treat long vowels and diphthongs as branching feet. If we do that, the choice of the short form is immediately accounted for, and we arrive at an analysis that is entirely metrical, making no reference to syllable structure at all: the short form occurs after a branching foot. We try to develop this idea in the next section.
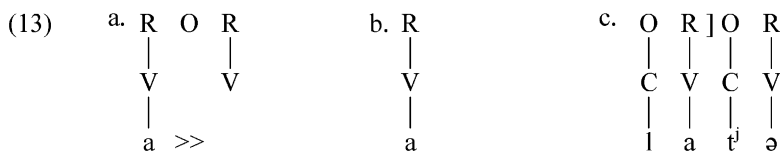
4. Diphthongs as two rhymes

At first sight one might be tempted to represent diphthongs as monosyllabic branching rhymes, rather than branching feet. In fact, if one analyses these entities as short vowels followed by a /j/ or /w/, they fit the paradigm of rhymes that contain a short vowels and a sonorant liquid or nasal (as suggested in van der Hulst, 1984). However, Zonneveld and Trommelen (1980) show that diphthongs behave like 'superheavy syllables' with regard to stress, and that means that, like 'superheavy syllables', they do act like branching feet. Also, if /j/ and /w/ are analysed as vowel entities in consonant position, it could be argued that two vocalic units within the rhyme are not possible, just as two obstruents are not possible in a branching onset. These various points are accounted for if we represent diphthongs as bi-rhymal:

(12)

```
            F
          /  \
   O  R  O  R ] O  R
   |  |  |  |   |  |
   b  œ  ɣ  tʲ  ə
```
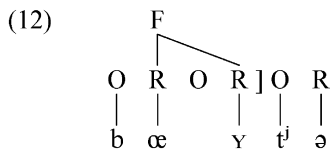
Since diphthongs in this analysis form a branching foot, we now correctly predict the occurrence of the short form and have come very close to allowing a pure metrical analysis. However, there is still the matter of long vowels, which we consider in the next section.

5. Long vowels

An obvious step at this point would seem to argue that long vowels are bi-rhymal, just like diphthongs. We could then state that the short form uniformly occurs after a branching foot. Unfortunately, and this is where for us the foot-only analysis breaks down, we cannot support this proposal. In fact, rather than proposing that long vowels have the structure in (13a) we argue that they have the structure in (13b), which means that the short form, which occurs after long vowels and diphthongs, is chosen after a non-branching foot:

(13)

```
a.  R  O  R        b.  R           c.  O  R ] O  R
    |     |            |               |  |   |  |
    V     V            V               C  V   C  V
    |                  |               |  |   |  |
    a  >>              a               l  a   tʲ ə
```

Although we would want to argue that *true* long vowels are universally bi-rhymal, there are compelling reasons for believing that the Dutch long vowels are in fact short. The prime reason for treating 'long' vowels as 'short' is that these vowels behave as light for the purpose of word stress. In Dutch, as has been shown in various works (van der Hulst, 1984; Kager, 1985; Langeweg, 1988; Zonneveld and Trommelen, 1999), the relevant criterion for weight is open vs. closed syllables. Short vowels, which, as we have seen, can only occur in a closed syllable count as heavy and project a foot head, while 'long vowels' are either dependents or heads, depending on their position in the string. In polysyllabic words, unless they are exceptionally finally stressed, long vowels form a dependent (14a), but in monosyllabic words, and in words

in which final long vowels bear (exceptional) stress, a non-branching foot must be postulated (14b):

(14) a. F F   b. F   F   c.   F

a k é l a] tʲ ə   k a n a p é] tʲ ə   z e] tʲ ə
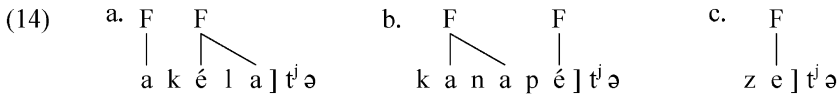
The analysis of the relevant contrast within the vowel system as something other than a length contrast has a considerable tradition. It was proposed by van Wijk (1939), as well as recently by van Oostendorp (2000) and van der Hulst (2003). The latter treats all vowels as short, adding the requirement that short vowels must be followed by a C position in the rhyme. In section 2, we briefly considered the formal approach suggested in van der Hulst (2003), using subcategorisation, to implement this idea.

A consequence of insisting that long vowels are single non-branching rhymes, rather than bi-rhymal, is that we cannot maintain the generalisation that the short form of the diminutive suffix occurs after a branching foot. Bases ending in a tense vowel would have to be treated as an exception to this generalisation.

6. The branching rhyme analysis

In this section we present a purely syllable-based account of the type proposed by Trommelen (1983). The foot-only analysis aimed at making sense of the distribution of the short and long forms by saying that the short form occurred after a branching foot and the long form after a non-branching foot. But this analysis breaks down when it comes to bases ending in tense vowels if one is committed to the idea these vowels project a non-branching structure.

We will now explore the idea that a different type of generalisation can be made, which is that the long form is chosen after a *branching rhyme*. Using the structures that we have developed so far, and analysing long vowels as short, we can maintain this generalisation in all cases: the only case in which the final rhyme of the base is branching is when a lax vowel is followed by a sonorant consonant (*kam*); this is the only case in which we find the long form.

There is, however, also one apparent problem for this account. Consider the forms in (1k), represented in (3). Here the final rhyme is branching, but the short form is found instead of the long form. To avoid *bódem-etje*, we would have to say, in addition, that, in order to select the short form, the branching rhyme must be stressed. It is interesting to note, as Trommelen (1983) observes, that the position of stress does not matter in all cases; see for example (1d), where the stem ends in a vowel. Trommelen develops an analysis that makes no reference to stress at all and, in fact, states that only the final rhyme is relevant: the long form is chosen when the final rhyme branches, just the analysis which we also wish to pursue.

We will now show that Trommelen can maintain this generalisation only by using syllabifications that we think are dubious and, in any event, incompatible with the overall framework that we adopt. To maintain the generalisation, she must add a condition that the daughters of the branching rhyme must be non-branching. She has to state this because 'superheavy syllables' (which take the short form) are considered in her model to have branching nuclei within their branching rhymes: $[[VV]_N[C]_{Cd}]_R$. Also, to deal with the difference between *kam* and *kat*, she proposes that the /t/ in *kat* occupies a place in a branching coda of which the other position is empty: $[[V]_N[\varnothing C]_{Cd}]_R$. Finally, to avoid reference to stress in case of final schwa, Trommelen suggests that

schwas occupy a branching nucleus whose left part is empty: $[[\varnothing V]_N[C]_{Cd}]_R$.[18] In short, superheavy syllables, short vowels followed by obstruents and schwa followed by a consonant all reject the long form, because, even though they have branching rhymes in her account, one of the daughters of the rhyme (either the nucleus or the coda) is branching.

Under the theory assumed here, the daughters of the rhyme *cannot* be branching. We also do not adopt a difference between a rhyme and a nucleus node. We postulate only one structure to counterbalance the onset, the rhyme (van der Hulst and Ritter, 1999). Thus, superheavy syllables are analysed as two syllables (see (4)), while alleged obstruent codas are analysed as onsets (see (7)). How can we tackle the third issue, schwas followed by a consonant? Given that only sonorants are allowed in the coda, schwa plus obstruent is not a problem, as there is no branching rhyme. The obstruent forms an onset followed by an empty rhyme (cf. (15b)). What remains is to provide an account for *bodempje* (with an unexpected short form after an apparent branching rhyme). Following van der Hulst (1984), who also offers an analysis that makes no reference to stress or foot structure, we adopt the idea that an unstressed syllable has a different structure from a stressed syllable. In particular, a schwa followed by a sonorant consonant does not form a branching rhyme if we assume that dependent syllables do not allow branching rhymes; they must be unmarked (i.e. non-branching) in terms of their syllable structure. This idea supports the general proposal made in van der Hulst and Ritter (2002) that parameter setting is 'head-driven', i.e. the setting of parameters (e.g. for rhyme structure) can be different depending on whether the rhyme occupies a head position or a dependent position in the prosodic structure. If the setting is different, the setting in head position is always marked (i.e. branching), whereas the setting in dependent position is unmarked (non-branching). This implies that a schwa followed by an apparent coda consonant must be analysed as a non-branching rhyme followed by an onset, (15a):

(15)   a.

b.
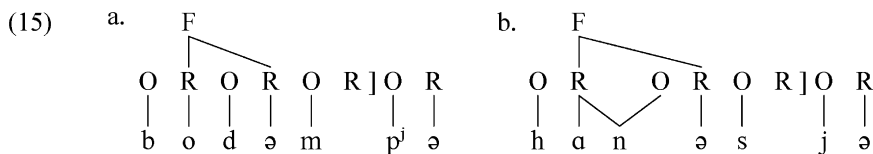
If this idea is adopted, we can maintain the point of view that the long allomorph occurs after a branching rhyme.[19] Like Trommelen, we make no reference to stress, but unlike her condition for the occurrence of the long form, the condition that the rhyme must branch does not have to be annotated by stipulating that the daughters of the rhyme are not allowed to branch, nor does it require assumptions about the representation of (a) schwa, (b) superheavy syllables and (c) alleged coda obstruents that cannot be brought in line with independently motivated proposals for syllabic constituents. We claim that our proposals that (a) schwas must occur in non-branching rhymes, (b) superheavy syllables are bisyllabic and (c) obstruents cannot occupy codas[20] are more plausible, although we have not been able to provide all the necessary support in this article.

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[18] In his review of Trommelen (1983), Shannon (1988) observes that the latter two structures that Trommelen must assume to arrive at her statement that the long form after a branching rhyme lack independent motivation. Booij (1984) voices similar objections.

[19] Marc can Oostendorp suggests that schwa–sonorant consonant cases (e.g. *bodem*) could be argued to have non-branching rhyme containing a syllabic sonorant consonant. This approach will work in a theory that allows sonorant consonant to be rhymal heads.

[20] Van der Hulst (1984) did not assume this, so it had to be stipulated that the right-hand daughter of the branching rhyme must be a sonorant consonant.

7. The relevance of secondary stress

In forms like *kóning* (as in the case of *bódem*; cf. (14a)) we find the short form, because the sequence *ing*, being in dependent foot position, cannot form a branching rhyme[21]:
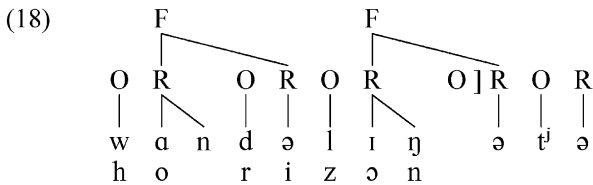
(16)
```
              F
            ╱╱│
        O  R  O  R  O  R ] O  R
        │  │  │  │  │  │   │  │
        k  o  n  ə  ŋ  kʲ      ə
```
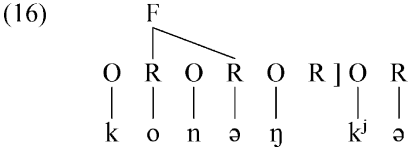
Foot structure is not *directly* relevant, given that our analysis refers to the structure of the final rhyme of the base. Foot structure is indirectly relevant, in that the second rhyme, being dependent, cannot branch, which implies that /ŋ/ is a separate onset.

Now consider the following forms:

(17)   a.   wandeling-etje   b.   leerling-etje
            horizon-etje
            boemerang-etje
            charlatan-etje

It is not unreasonable to assign the following prosodic structure to the forms in (17a):

(18)
```
          F                 F
        ╱╱│              ╱╱│
    O  R      O  R  O  R      O ] R  O  R
    │  ╱╲     │  │  │  ╱╲     │   │  │  │
    w  ɑ  n   d  ə  l  ɪ  ŋ   ə   tʲ    ə
    h  o      r  i  z  ɔ  n
```

In other words, the long form is chosen because the stem ends in a final branching rhyme, which is allowed because it has stress, albeit secondary.[22]

The case in (17b) is different, in that the string *ling* apparently has secondary stress even though it is not separated from the primary stress by an unstressed syllable. The explanation (as has been suggested by most previous analyses) is that *-ling*, being a suffix, has inherent prosodic weight. We thus expect the long form. The alternative form *leerlinkje* reflects 'prosodic weakening' (due to lexicalisation) of this (unproductive) suffix. Such prosodic weakening can also affect compounds. Normally, the second member of a compound projects its own prosodic structure and thus conditions the choice of allomorph as if it occurred by its own. However, frequently used words like *kauwgom* 'chewing gum' prefer *kauwgompje* (behaving like monomorphemic *bezem*), which reflects prosodic weakening.

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[21] The vowel in (16) has a somewhat different 'colour' (fronter and higher) than the standard schwa, but we treat it here as a positional variant of schwa. The velar nasal, which cannot occur before full vowels, can occur before a silent rhyme and before schwa (*engel* 'angel').

[22] What is interesting here (as pointed out to us long ago by Carlos Gussenhoven) is that the choice of allomorph seems to be dependent on the presence of a secondary accent, which is arguably not available in the lexicon; cf. van der Hulst (1984, 1999).

Trommelen (1983) and van der Hulst (1984) discuss various other exceptional types of cases which display vacillation, as illustrated in (19):

(19)   geranium   -pje or -etje   satan   -tje or -etje

This can be explained by assuming that forms like *geranium* vacillate between a metrical structure in which *um* is a foot by itself and a structure in which *anium* is a parsed either as a ternary foot or as a binary foot (*ani*), followed by an unparsed rhyme (*um*). Forms like *satan*, with a full vowel in the last syllable, can also be argued to vacillate between a single branching foot and two non-branching feet (see van der Hulst, 1984:128–131).

These cases can be incorporated into the analysis by assuming that the variable status of the final syllable with respect to stress causes the syllable structure of the final syllable to be different. If the final syllables have secondary stress, their rhymes are allowed to be branching so that they select the long form. If these syllables are incorporated into the preceding foot, their rhymes are non-branching.

In conclusion, the following uniform constraint (given in both positive and negative forms) accounts completely for the occurrence of the long allomorph[23]:

(20)   a. Select -ət^{j}ə / R] __   b. *R] -ət^{j}ə

Because rhyme structure and foot structure are intimately related, the question remains whether the rhyme-based analysis can be translated into a prosodic analysis (which would of course differ from the one developed in the first part of this article). It so happens that the branching rhyme environment always constitutes a non-branching foot, a fact that follows from the stress analysis which designates branching rhymes as heavy. However, given that long vowels also can project non-branching feet while taking the short form, we cannot make reference to this notion to account for the occurrence of the long form. Hence, as argued above, direct reference to foot structure for the long form is not possible. Nor is a homogenous metrical characterisation for the occurrence of the short form available. In many cases it occurs after a branching foot, but when the stem ends in a tense vowel this vowel may either have primary or secondary stress (non-branching foot) or be a dependent in a stress foot (when stress is penultimate). Long, or rather tense, vowels prevent a pure metrical analysis, precisely because their behaviour with regard to foot structure is not consistent but depends on context; long vowels can be heads as well as dependents of branching feet or, exceptionally, form non-branching feet themselves.

8. The lexical form of the suffix

As suggested in van der Hulst (1984:127), and following van Zonneveld (1978), rather than adopting an invariant underlying form from which the other allomorphs are derived, we can

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[23] In casual speech the sequence of /j/ + schwa can be pronounced as [i] (written <ie>): *kas-i, huis-i, ramp-i*, but not *kat-i, laant-i*. This is true for some dialects of Dutch, but not for all, as Marc van Oostendorp has pointed out to us. Certain varieties do allow *kattie, laantie*; others allow e.g. *lepeltie* but not *kattie*, etc. In this article we do not offer an account of this 'casual' allomorph.

collapse the allomorphs into a single lexical form that includes *variable* (or *disjunctive*) information (variable material is placed between parentheses):

(21)   -(ə) ({[−son], ([+cor])})^{j}ə

The only non-variable material is /jə/, although the /j/ will occur either by itself (in the allomorph /jə/ or as a secondary articulation (when preceded by an obstruent)), which in the case of [t^j] gives a palatal consonant (cf. Lahiri and Evers, 1991). Variable information is obligatorily expressed if no constraint is violated. The relevant constraint for not choosing the schwa is (20). If this constraint is violated, we 'move on' to the next longest form: /({[−son], ([+cor])})^j ə/. This form is allowed in many cases, but not in all. The obstruent fails to show up when the stem ends in an obstruent. The statement of the relevant constraint would be something like (22):

(22)   *obstruent - t - j

It could be argued that the relevant constraint is needed independently to enforce disappearance of /t/ even when it is part of the stem[24]:

(23)   a.   kɑst + jə > kɑs + jə   b.

We now move on to the next longest form /({[−son], ([+cor])})^j ə/, with the variable coronal element. The coronal element fails to show up when the preceding nasal consonant has a different place element; this follows from a constraint that demands homorganicity between a nasal and following obstruent. If [+coronal] cannot appear and thus no place is present, the place of the obstruent will be the same as that of the preceding nasal. The homorganicity constraint is inviolable in the phonology of Dutch, but is not always met by blocking the place of the obstruent. In the framework assumed here, parts of lexical material can only be unexpressed if represented as variable. In other situations, the constraint is met by 'epenthesis' of a transitional obstruent. We see this, for example, in derived forms with the suffix /-tə/, as in *ruim-te* 'space' or, combined with the prefix /gə-/ and with different semantics: *ge-raam-te* 'skeleton' or in the verbal paradigm *zwem-t* 'swims'. In all these cases, an epenthetic [p] occurs between the /m/ and /t/. In still other cases the homorganicity constraint is met by 'nasal place assimilation': *on-machtig > om-machtig* 'powerless', which suggest that the nasal has a variable place property,

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[24] If deletion is to be avoided entirely, this means that such words are lexically represented as /kas(t)/. The 'deletion' of /t/ also occurs in phrasal context: *wist je > wis je* 'knew you' [did you know?]. This means massive allomorphy, since *all* words in *-st* will have an optional *-t*.
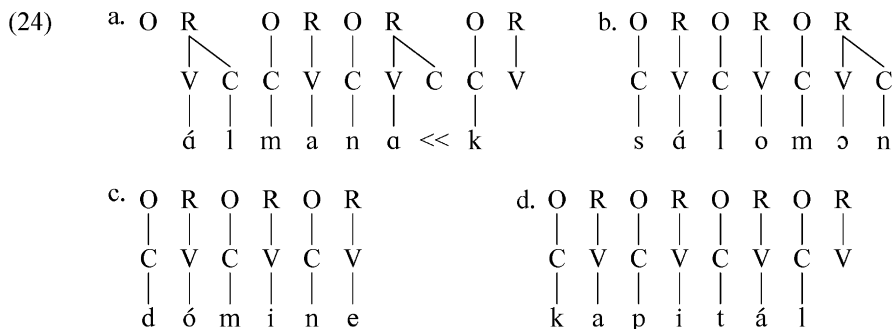
The /t/ in (23) belongs to the 'appendix', which van der Hulst (2005b) characterises as a phonological clitic. Forms with appendices can be even more complex, as in the word *vriend*: [vr]$_O$ [ie]$_R$ [n∅]$_O$ [d∅]$_R$ which takes the short form (*vriendje*), like all forms that end in an obstruent.

coronal (which appears when there is no following consonant).[25] In conclusion, we do not need rules that either insert or delete material.[26]

The approach adopted here toward allomorphy is consistent with the monostratal approach found in Declarative Phonology (Scobbie, 1997; Scobbie et al., 1996; cf. van der Hulst, 2005b). We do not derive the allomorphs from an *invariant* underlying form (/-tjə/ in most analyses; cf. Booij, 1995), using (extrinsically ordered) information-adding and information-destroying rules. Note also that the constraints that enforce the distribution of the different expansion of the underlying form can be stated as general, in the sense of 'surface true'. One might argue that the 'constraint' in (20), due to its segmental specificity, implicitly makes reference to morphological information. I would argue that it does not. It is just very specific.[27]

9. Back to stress

In the traditional metrical analysis (van der Hulst, 1984; Kager, 1985, 1989; Langeweg, 1988; Zonneveld and Trommelen, 1999), closed syllables with lax vowels are considered to be heavy, while open syllables with tense vowels are light. We have assigned different structures to lax vowel–consonant sequences, depending on whether the consonant is an obstruent or sonorant. However, for the purpose of stress both types of structure appear to act in the same way:

(24)   a. O R   O R O R   O R   b. O R O R O R   R
              V C   C V C V C   C V   C V C V C V   C
              á   l m a n ɑ << k   s á l o m ɔ   n

       c. O R O R O R   R   d. O R O R O R   O R
              C V C V C V   C V C V C V   C V
              d ó m i n e   k a p i t á   l

For the purpose of accent (24a) and (b) behave in the same way. While (*mine*) in (24c) can form a branching foot, (*manak*) and (*lomon*) cannot. But in our approach the reasons are different. In *almanak*, (*nak*) is a foot because it is a branching structure (*na.k∅*). In *Salomon*, (*mon*) is a foot because branching rhymes cannot be dependent.
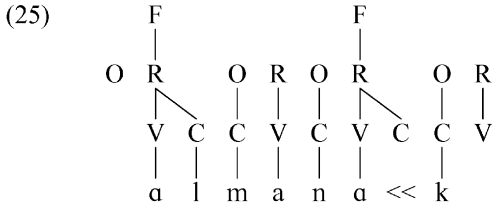
An apparent problem for our set of representations emerges when we compare (24a) and (24d), the latter ending in a 'superheavy' syllable. In our account there is no clear difference – both end in a branching foot. Yet (24a) has initial stress, which in the traditional analysis was derived by making a final non-branching foot extrametrical. This analysis still 'works' for the

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[25] Van der Hulst and Kooij (1981) suggest that a 'stem-integrity' constraint can be used to predict how the homorganicity constraint will be met.

[26] Nor do we see a need for ranking constraints on a language-specific basis, as in van de Weijer (2002), who does not consider the choice of allomorph after long vowels and diphthongs.

[27] It has been noted by many authors that certain other suffixes display allomorphy between forms with a schwa and without (the suppletive allomorphy between the plural suffixes /-s/ and /-ən/ is a case in point (cf. van der Hulst and Kooij, 1998). It remains to be seen whether (20) can be subsumed under a constraint with wider scope. However, this has no impact on the validity of using constraints that are very specific. The crucial point is that the constraint is 'true'.

Salomon case, where the final foot is indeed non-branching. The solution is to say that in *almanak* the final foot is also non-branching, leaving the final *empty* rhyme unparsed. This would simply confirm the 'bimoraic' foot theory, in which heavy syllables form feet by themselves, rather than form HL feet (Kager, 1993):

(25)

```
        F                       F
        |                       |
   O    R      O   R   O   R        O   R
        /\     |   |   /\       |   |
   V    C  C   V   C   V   C        C   V
   |    |  |   |   |   |   |        |   |
   ɑ    l  m   a   n   ɑ  <<   k
```
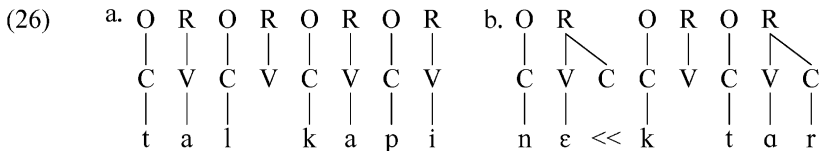
The first and second foot of *almanak* are non-branching, leaving the second and (silent) final rhyme unparsed, if we adopt the idea that a heavy syllable will always form a foot by itself.

It would seem then that the present analysis is compatible with a somewhat updated version of the metrical analysis of Dutch stress in van der Hulst (1984).

10. The distribution of superheavy syllables

It has long been observed that superheavy syllables can only occur as final syllables, a generalisation that allows for only few exceptions. What we need to ensure is that while superheavy syllables cannot occur word-internally, syllables 'closed' by an obstruent geminate can. Consider the nonsense word *taalkapi* and the actual word *nectar*:

(26)   a.

```
   O   R   O   R   O   R   O   R      b.  O   R       O   R   O   R
   |   |   |   |   |   |   |   |          |   |       /\      |   |   /\
   C   V   C   V   C   V   C   V          C   V   C   C   V   C   V   C
   |   |   |   |   |   |   |   |          |   |       |   |   |   |   |
   t   a   l       k   a   p   i          n   ɛ  <<   k       t   ɑ   r
```

How can we prevent (26a), while allowing (26b)? Van der Hulst (2003) accounts for the distribution of superheavy syllables by stating that word-internal empty rhymes cannot license a preceding contentful onset. This constraint was formulated within a context that did not represent lax vowel-obstruent sequences in the way we do here. To differentiate between (26a) and (26b) we can, however, appeal to the same constraint, adding only that onsets that are involved in a (pseudo-)geminate structure are exempt from it. We could construe this as an instance of the broader 'geminate-integrity' phenomenon discussed in Schein and Steriade (1986).

11. Conclusions

The analysis proposed in this article does justice to all the facts that we aware of, and does so in a constraint-based, non-derivational framework. Our main conclusion is that the conditions for the choice between the long and short forms of the diminutive suffix do not make reference to the segmental content of the final stem segment. Thus we support the idea that the conditions refer to structure. However, we do not share the proposal put forward by various authors that the relevant structure is or includes metrical foot structure. Instead, we follow Trommelen (1983) in claiming

that the relevant structure is exclusively the branchingness of the final rhyme of the base. However, our proposal has incorporated certain aspects of the analysis in van der Hulst (1984) (whose analysis, although making reference to syllabic structure, also refers to segmental conditions) as well as more recent ideas about syllable structure stemming from the framework of Government Phonology, which seem better motivated than the syllabic assumptions that Trommelen needed to make her proposal work. Finally, we have shown how a lexical representation that allows variable information that can only occur if it violates no constraints can accommodate the occurrence of the various allomorphs.

Acknowledgements

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