‘Ambisyllabicity in Dutch’

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0. Introduction

The purpose of this paper is to show that so-called ambisyllabic consonants are to be represented as long consonants. The particular representation I choose was suggested in Van der Hulst and Smith (1982) and more firmly substantiated with evidence from Danish in Borowski et al. (1983). Here I will substantiate the proposal on the basis of evidence from Dutch by proposing a coherent analysis of Dutch syllable structure, and in particular of the distribution of short and long vowels. I will furthermore show that ambisyllabic consonants have the property of *inalterability*, identified in Hayes (1984) as a property typical of long segments. This provides independent support for the proposal to regard ambisyllabic consonants as long consonants.

1. The distribution of Dutch vowels

1.1. Preliminaries

In the analysis of Dutch it has proved to be useful to distinguish four sets of vowels:
(1)

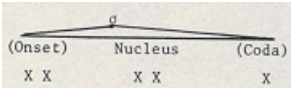
a. I, E, O, U, A	-	short, lax
b. a, e, o, ø, y, i, u	-	long, tense
c. Ej, Ow, Uj	-	diphthong
d. inve;	-	schwa

(The notation employed is provisional, but it suffices here. Cf. Cohen et al. (1959) for a description of Dutch phonology.) The main reason for distinguishing these sets is their distribution. In the next four sections I will go through the most significant distributional properties of the four sets and show how these properties are accounted for in an overall analysis of Dutch syllable structure. This analysis combines features of the analyses proposed in Trommelen (1983) and Van der Hulst (1984, 1985). Most of what is taken for granted here is discussed in these publications.

1.2. The distribution of short vowels

It has frequently been observed that short vowels cannot occur word-finally, whereas long vowels, diphthongs and the schwa can occur in this position. To explain this defective distribution of short vowels I assume that a syllable has the following canonical form (ignoring further internal structure):

(2)



For our purposes it is necessary to see that the nucleus is *obligatory* and contains *two* positions. These two positions must be filled, but a short vowel is only capable of filling one position, since its representation is as in (3):

(3)

X
|
A

Given that the nucleus consists of two positions, a short vowel alone is not sufficient. It must be 'checked' be a consonant which is linked to the second nucleus position.

1.3. The distribution of long vowels

Another classical observation is that long vowels cannot occur before two consonants of which the second is non-coronal, whereas a short vowel can. The requirement 'non-coronal' allows us to disregard the so-called 'appendix' which contains from one to three coronal consonants and which can be added to each syllable, provided that it stands in word final position:

(4)

a.	/mElk/	melk	'milk'	b.	*/melk/
	/hUlp/	hulp	'help'	*/stolp/	
	/Arm/	arm	'arm'	*/arm/	

The way to explain this defective distribution is to say that a long vowel is represented as follows:

(5)

The contrast between long *a* and short *A*. (where *a* and *A* are merely suggestive symbols) is one of multiple versus single association of the same 'vocalic segment', specified as [+low].

A long vowel occupies both obligatory nucleus slots, and can be followed by one consonant only, since the coda is limited to one position. A short vowel can be followed by two consonants, one in the second nucleus position and one in the coda position.

1.4. The distribution of diphthongs

Diphthongs have essentially the same distribution as long vowels. There is one very striking extra gap in the distribution of diphthongs: they do not occur before /r/.

It has been a long-standing question in Dutch phonology how diphthongs are to be represented; as primitives, as clusters of two short vocalic segments or as clusters

of a short vowel and an approximant /j/ or /w/. In Van der Hulst (1984) I opt for the third possibility. On the face of it, short vowel-approximant clusters do not occur in Dutch. Since the second nucleus position can be associated to both vocalic segments (in the case of a long vowel) and all consonantal segments (in the case of a checked short vowel), we do not expect approximants to be excluded here. Under my interpretation of diphthongs they are not. The combination is subject to some limitations, however. Both segments must harmonize in backness, and the low vowel is excluded.

This solution offers a nice explanation for the fact that diphthongs are not allowed before tautosyllabic /r/. In Van der Hulst (1984) I adopt a proposal advanced in Selkirk (1984) to the effect that syllabic positions are indexed with a sonority value, which indicates which segment classes may occur in such a position. I show, however, that the second nucleus position and coda position do not have to be indexed at all. We only have to state that segments which are associated to these positions may not be adjacent on the sonority scale:

(6)

....	|-------	|-------	|-------	|-------	|.....
	m	n	l	r	j/w

We can now explain straightforwardly that diphthongs cannot be followed by /r/, in the same way as we can explain why /rn/, /rm/ and /lm/ are possible syllable-final clusters of sonorant consonants, but /ln/ is not.

As we will see later, this particular representation of diphthongs is going to do more work for us.

1.5. The distribution of the schwa

Although phonetically a (very) short vowel, the schwa can appear word-finally, unlike the short full vowels. In addition, as Trommelen (1983) observes, schwas fail to occur before a cluster of two consonants of which the second is non-coronal. It seems then as if schwas have a distribution which is similar to that of long vowels, with one notable exception: they cannot occur in a stressed syllable.

To explain the distribution of schwa in a way that is compatible with the metrical theory of stress (cf. Hayes 1981), I propose in Van der Hulst (1984) (where a full analysis of stress in monomorphemic words can be found) to have two types of nuclei for Dutch:

(7)

The Dutch stress foot is assumed to be sensitive to the nucleus type of syllables. Syllables with a branching nucleus can be the head of a foot, syllables with a non-branching nucleus cannot.

It will be clear that the distributional properties of the schwa are explained on the assumption that the schwa (and only the schwa) can occur in a non-branching nucleus. Given that the coda contains at most one slot, the schwa cannot be followed by more than one consonant (again ignoring the appendix).

The requirement that only the schwa may occur in a non-branching nucleus is applicable to underlying representations only. I assume that in surface representation a rule may turn an *unstressed* branching nucleus into a non-branching one, thus paving the way for vowel reduction to take place. Reduction can only take place if a vowel is followed by a consonant but I will not go into this matter here any further.

2. The representations of ambisyllabicity

In section 2, I tacitly assumed that because short vowels are barred word-finally, they are barred syllable-finally. Another way to express the defective distribution of

the short vowels is to state a word-level filter (as proposed in Booij 1984), thus claiming that word-internal syllables may end in a short vowel. At first sight this seems to be the case:

(8)

kassa, watten, hebben, …

The words in (8) are given in their spelling form. The intervocalic consonant is phonetically short and this may lead one to assume the corresponding syllabic skeleton in (9), with a syllable division which is in accordance with the well-known principle according to which an onset is maximized at the expense of the coda of the preceding syllable (Maximal Onset Principle):

(9)

C V . C V C

If the representation in (9) is correct, we have evidence for the claim that syllables ending in a short vowel are only barred word-finally. But it can be shown that this is inadequate. If it were true that word-internally short vowels may end a syllable, then we would expect to find words having the structure in (10), alongside those having the structure in (9), since there is absolutely no problem with syllables starting with a vowel:

(10)

C V . V C

In fact, however, words of this type do not exist. If two vowels meet, the first one cannot be a short vowel:

(11)

a.	/hi.at/	hiaat	'hiatus'	b.	*/hI.at/
b.	/xa.Os/	chaos	'chaos'		*/xA.Os/
c.	/kre.ol/	creool	'creole'		*/krE.ol/

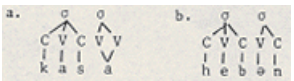
Surely, to say that syllables ending in a short vowel cannot occur word-finally, and not before an onsetless syllabe is to admit that one has not yet come to full grip with the distributional properties of short vowels.

A second argument against (9) can be based on stress assignment. Words of the type *dilemma, confetti, programma, madonna* etc. (in which the last two syllables are phonetically of the form C V C V V) behave exactly the same as words like *waranda, fiasco, agenda* etc. (in which the penultimate syllable is clearly closed). Words of the *dilemma* type then never have initial stress, because a prefinal VC syllable cannot be skipped by the rule which assigns main stress; cf. Van der Hulst (1984), chapter 5.

In Van der Hulst (1984), I therefore propose that the non-occurrence of short vowels in word-final position, their limited distribution word-internally and the stress facts just mentioned can properly be explained by assuming that every syllable containing a full vowel has a branching nucleus. Cf. (2).

It might now be asked how the words in (8) are to be syllabified. One possibility is as in (12):

(12)



Apart from its awkwardness (violation of the Maximal Onset Principle), the parsing in (12) can be shown to be wrong. The second example in (12) shows a voiced obstruent in syllable-final position. However, Dutch has a rule of syllable-final devoicing, given in (13). For a fuller discussion of this rule, and its relation to voicing assimilation, I refer to Van der Hulst (1980). Voiced obstruents are not only absent word-finally, but also word-internally if syllable-final, as shown in (14):

(13)

(14)

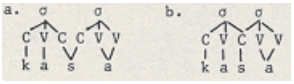
a.	/prls.ma/	prisma	‘prism’	b.	*/prlz.ma/
	/Os.lo/	Oslo	‘Oslo’		*/Oz.lo/

Now we can change the formulation of the rule, blocking application if the following segment is a vowel. But it is not very likely that we must proceed in this way.

What then should be the parsing of the words in (8) ? One approach, going back to

at least Hockett (1965), is to say that in certain cases (the words in (8) would be an example) an intervocalic consonant (even consonant sequence) belongs simultaneously to two syllables, constituting what Hockett called an *interlude*. In our case, where a single segment is involved, phonologists have used the term *ambisyllabic segment*. Now we cannot put syllable boundaries in the middle of segments, so the necessity of assuming ambisyllabic consonants (AC's) is in any case an argument in favour of nonlinear representations of the syllable. But we still have two possibilities of representing AC's:

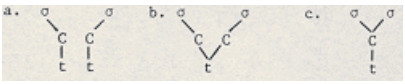
(15)



In (15b) we view AC's as a special sort of entity, which requires us to adopt *improper bracketing*. In (15a) it is claimed that AC's are represented phonologically in the same way as we represent *long* segments. To make this proposal acceptable, we have to claim that one and the same phonological configuration need not receive the same phonetic interpretation in all languages, which does not strike me as an unlikely claim at all.

Furthermore, the two ways of representing AC's as in (15) have different empirical consequences. As is pointed out in Van der Hulst and Smith (1982), choosing (15b) makes it impossible to have a contrast between consonants which are long and those which are ambisyllabic, since both are identical at the phonological level. The claim that long consonants and ambisyllabic consonants are indeed mutually exclusive can be found in Vogel (1977). Borowski et al. suspect that the matter is more complicated. Long sonsonants may still contrast if we allow representations as in (16a), for a long segment, to contrast with those in (16b), ambisyllabic or long as the case may be. The point is that allowing representations as in (16c) always gives us one possibility too many, since it will then allow a three-way contrast which does presumably not exist:

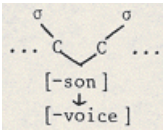
(16)



As far as Dutch is concerned, there is no contrast between so called AC's and long consonants. So there cannot be any objection against representing AC's as long segments.

In addition to this argument in favour of treating ambisyllabic consonants as long consonants, another line of argumentation would be to show that ambisyllabic consonants and (clearly) long consonants share certain properties. The question then is: do AC's have properties which are characteristic of long segments? In fact they do. Let us turn back to final devoicing. We saw that this rule does not apply to AC's, and one could argue that this is not expected since rule (13) seems applicable to the lefthand side of AC's:

(17)



In this connection, it is interesting that Hayes (1984) discusses three properties which are typical of long segments. One of these is the property of *inalterability*:

(18)

Inalterability
Long segments often resist the application of rules that a priori would be expected to apply to them

Hayes shows that the rules which fail to apply always refer to two tiers and he proposes the following constraint on the application of such rules:

(19)

Linking constraint
Association lines in structural descriptions are interpreted as exhaustive

This means that if a rule refers to A-B it will only apply if neither A nor B is associated to any other segment.

Since Hayes mentions the property as one of long segments, it is striking that AC's appear to have precisely this property with respect to final devoicing.

3. Syllabification, vowel checking and vowel lengthening

Having established how we must represent AC's, I would now like to go into the question whether AC's are represented underlyingly as distinct from short consonants, or whether they arise in the course of the derivation. Since in Dutch long and short consonants do not contrast, we expect that the second option applies here.

The syllabic organization is largely predictible given the segmental make-up of the string. The only non-segmental information that we must assume is length for vowels, as we have seen that there are long and short vowels.

The following steps are relevant in the process of syllabification:

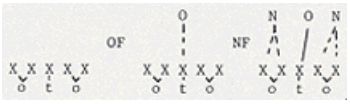
(20)

Onset Formation (OF)
Nucleus Formation (NF)
Nucleus Expansion (NE)
Coda Formation (CF)

Prior to OF we may assume a stage of ‘X-formation’. Only long vowels are linked to two X's underlyingly. For all other segments it holds that they correspond to exactly one X at the initial stage of the derivation. To simplify the exposition, I take this first step - i.e. of supplying X's - for granted here.

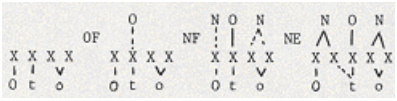
Consider as input: /oto/ auto ‘car’:

(21)



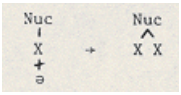
Now consider as input /Oto/ Otto '(a name)':

(22)



The rule called Nucleus Expansion is formulated as follows:

(23)



Following this rule, we get leftward association, i.e. the intervocalic consonant becomes multiple-associated. I conjecture that rightward spreading does not have to be stipulated here. Spreading of the consonant takes precedence over spreading of the vocalic element, because the distinction between single and multiple association of consonantal segments is not contrastive, whereas the same difference is contrastive when it concerns vocalic segments.

The vocalic element will spread only if the consonant cannot. This implies that we can represent final vowels as short underlyingly, i.e. as melodic segments which are not lexically linked to two X's. Rule (23) will create two X's and, as there is no consonant available, the vowel will ‘lengthen’.

In a few marked cases, however, spreading of the consonant is blocked, and there we get spreading of the vowel. At least, this is a way of dealing with cases in Dutch in which we find vowel lengthening:

(24)

a.	dAg	dagen	‘day(s)
	spEl	spelen	‘play(s)’
	slOt	sloten	‘lock(s)’

b.	satAn	satanisch	‘satan	satan-like’
	demOn	demonisch	‘demon	demon-like’
	IsraEl	Israelisch	‘Israel	Israelian’

These cases in (24a) represent an isolated and small group of morphemes. The alternation goes back to an open syllable lengthening process which took place in the Old Dutch period. Some of these morphemes also show lengthening before certain derivational suffixes. The lengthening in (24b) only takes place before certain non-native suffixes (-*isch*, -*icus* and a few others). Lengthening is morpho-lexically governed in both cases.

A third type of case were we find vowel lengthening instead of consonant lenghtening will be discussed in section 4.3.

4. Some (apparent or unexplained) gaps in the distribution of ambisyllabic consonants.

4.1. Approximants do not appear as AC's.

Carlos Gussenhoven pointed out to me that /j/ and /w/ do not appear as AC's:

(25)

a.	/kajAk/	kayak	‘kayak’	b.	*/kAjAk/

However, given the analysis that I have proposed for diphthongs the gap is apparent only. Surely, if a short vowel is followed by an ambisyllabic approximant, the result will be a diphthong in the first syllable, which is followed by a homorganic glide serving as the onset of the second syllable. Words of this type are by no means missing:

(26)

4.2. Voiced fricatives do not appear as AC's.

With the exception of three words (*puzzel, mazzel, razzia*) Dutch does not allow short vowels to occur before voiced fricatives. Conversely, after long vowels they are the rule (exceptions: *heuse, kiese*, and the non-native vocabulary; cf. Kooij 1983). Dick Gilbers pointed out to me that this represents a gap in the

distribution of AC's.

At first sight, one might be inclined to say that Final Devoicing apparently does apply to ambisyllabic fricatives. It is known that fricatives devoice more easily. However, such an explanation is in conflict with our explanation for the fact that final devoicing cannot apply to AC's. It seems then that I have no explanation to offer for this gap.

4.3. The most curious gap

The gap that I will discuss in this section presupposes a discussion about onset clusters.

In Dutch there is evidence to distinguish between three types of consonant clusters, those that may occur as an onset both word-initially and elsewhere, those that may only occur as an onset only word-initially and those that may never occur as an onset.

(27)

Type I
Permissible word internal onsets
pr, pl, br, bl, kr, kl, xr, xl, tr, dr
fr, fl, vr, vl, gr, gl, kw, tw

Type II
Word-initial onset clusters
sC (sp, st, sk, sn, sm, sl)
sCC
kn, …

Type III
Non-onsets
lk, mp, rt, ...

(A full treatment of syllabic structure is found in Trommelen 1983 and Van der Hulst 1984, chapter 3.) Kaye and Lowenstamm argued in a *Glow*- lecture (Paris 1982) that it is universally true that syllables (ignoring the onset) consist of either VV or VC, and no more. If there is more (i.e. VVC or VCC), they say that syllables of this 'superheavy' type stand in a 'special position', i.e. in front of either a word boundary or a morphological boundary. Ignoring then morphologically complex words, we would expect that in Dutch there are no word-internal VXC syllables. To the extent that Kaye and Lowenstamm are right, we do not expect then to find long vowels before type III clusters, since that would create VVC syllables word-internally.

Trommelen (1983) points out that this holds true, at least to a certain extent. She claims that internal VXC is ruled out if the C is a sonorant, but not if it is an obstruent. In the following example /mp/ is not a permissible cluster:

(28i)

a.	/tEmpo/	tempo	‘tempo’	b.	*/tempo/

The empirical basis for the distribution between sonorants and obstruents is weak, and I will not adopt it here (see Van der Hulst 1984). However, it does seem to be true that internal VXC syllables are rather rare if compared to their frequent appearance as word-final syllables. I propose no formal mechanism to handle this strong tendency.

We can now show what is the difference between type I and type II clusters.
Like type III clusters, type II clusters are only rarely preceded by a long vowel.
So we find cases like the one in (28a) quite regularly, but not the one in (28b):

(28ii)

a.	/mOske/	moskee	‘moskee’	b.	*/moske/

The point is that we explain this gap if we assume firstly that /sk/ is split up and secondly that VXC does only rarely occur word internally.

Trommelen shows that we do find long vowels preceding type I clusters:

(29)

lepra, april, micro, metro, tetra, katrol,
matroos, matras, zebra, cobra, tableau, moeflon,
avro, livrei, program, aqua, etui

But there is another interesting fact to be noted as well, and this relates to the distribution of AC's. Not only are long vowels ruled out before type I clusters, short (stressed!) vowels are ruled out in this position too.

(30)

*/zEbra/

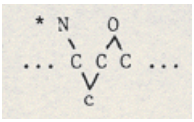
The requirement that the short vowel is stressed is essential. Recall that in unstressed position Nucleus Expansion can be 'undone', making it possible for a short E to precede a type I cluster. So, whereas (31a) is illformed, (32b) is possible, since the stress has shifted to the final syllable:

(31)

a. */Áfrika/ b. /Afrikán/

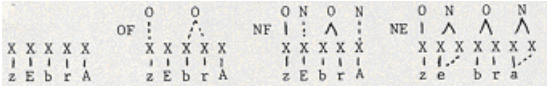
The non-occurrence of stressed short vowels before type I clusters represents a curious gap. (There are a few exceptions, however: *biáfra, ráglan, áblatief*.) Why couldn't the first obstruent of clusters be ambisyllabic? In other words why is the following configuration excluded:

(32)



Apparently, it is the case that consonant spreading is blocked in cases of this type. Hence, as we expect, Vowel Lengthening takes place:

(33)



The spreading consonant may not be dominated by a branching onset. It is not clear to me why this condition exists at all. So this is a gap in the distribution of AC's that I cannot really explain, although the conditions can be pinpointed quite precisely. Perhaps future research will bring to light other comparable cases where spreading is blocked under certain conditions. This single case does not allow us to formulate an interesting 'law', however.

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