

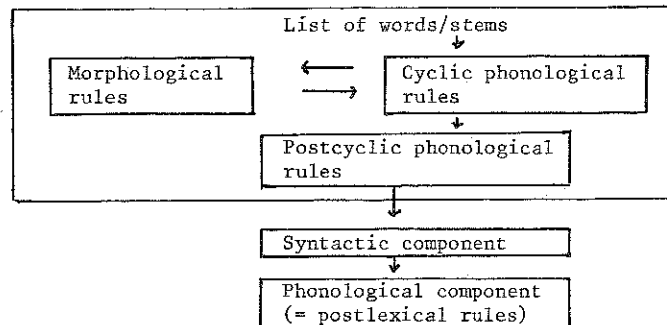
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## Lexical phonology, final devoicing and subject pronouns in Dutch

### 1. Introduction

The theory of Lexical Phonology (Kiparsky 1982) is a major step forward as compared to the standard theory of generative phonology. In Lexical Phonology two kinds of rules are distinguished: cyclic and postcyclic rules. Cyclic rules apply in the lexicon, and may interact with morphological rules, whereas post-cyclic rules apply in the phonological component which is ordered after syntax. In Booij (1981a, ch. 7, 1981b) this model is further refined in that two types of lexical rules are distinguished: cyclic and postcyclic rules. The reason for this refinement is that in this way the traditional and important distinction between word phonology and sentence phonology can be maintained in the form of the distinction between lexical and postlexical rules. Such an organizational model predicts that all the rules that do not mention inter-word boundaries in their contexts are ordered before those rules that (also) apply across word boundaries, i.e. in phrases. Once we assign all word-domain rules to the lexicon, a distinction between cyclic and postcyclic rules is necessary since certain lexical phonological rules may not apply cyclically. That is, I assume the following model:

(1)



The rule of syllable-final devoicing of obstruents in Dutch is a lexical rule, since it only applies within words. Yet, this rule has to be applied post-cyclically, since otherwise incorrect phonetic forms will be derived, as is illustrated by the words in (2):

- (2) voogd 'guardian' /voʏd/ [voxt]  
 voogdes 'female guardian' /voʏd+es/ [voʏdes]  
 held 'hero' /hɛlt/ [hɛlt]  
 heldin 'heroine' /hɛld+ɪn/ [hɛldɪn]

If Final Devoicing is applied cyclically, we would predict the incorrect phonetic forms [voxtɛs] and [hɛltɪn] for voogdes and heldin respectively, as the following derivation for heldin illustrates:

- (3) underlying form /held/  
 1<sup>st</sup> cycle: syllabification (held)<sub>s</sub>  
               Final Devoicing     t<sub>s</sub>  
 2<sup>nd</sup> cycle: -in-affixation                     in  
 phonetic form [heltɪn]

With Final Devoicing as a postcyclic rule,<sup>2</sup> the correct phonetic form is derived:

- (4) underlying form /held/  
 1<sup>st</sup> cycle: syllabification (held)<sub>s</sub>  
 2<sup>nd</sup> cycle: -in-affixation                     in  
               resyllabification           (hɛl) (dɪn)<sub>s</sub>  
 Post-cycle: Final Devoicing                     s  
 phonetic form [heldɪn]

As pointed out above, the model in (1) predicts that word-domain rules precede the rules of sentence phonology. This is nicely illustrated by the ordering of Final Devoicing with respect to Progressive Voice Assimilation, a rule which devoices fricatives after a voiceless obstruent. Final Devoicing must crucially apply before Progressive Voice Assimilation, as is particularly clear from cases in which we find an underlying voiced obstruent followed by a voiced fricative:

- (5) moed vatten 'to take courage' /mud vətən/  
 Lexicon: syllabification (mud)<sub>s</sub> (vɔ) (tən)<sub>s</sub>  
               Final Devoicing                     t<sub>s</sub>  
 Phonological component:  
               Prog. Voice Ass.                     f  
 phonetic form [mutfətən]

Note that the rule of Progressive Voice Assimilation has to apply here, even though the two obstruents agree in voicing at the underlying level. The importance of locating Final Devoicing in the lexicon is also confirmed by the fact that resyllabification across word boundaries, a process characteristic of more casual speech, never bleeds Final Devoicing, as illustrated in (6):

- (6) ik heb /heb/ een boek 'I have a book' (kɛ)<sub>s</sub> (pəm)<sub>s</sub> (buk)<sub>s</sub>  
               \*(kɛ)<sub>s</sub> (bəm)<sub>s</sub> (buk)<sub>s</sub>  
 ik zet mijn hoed /hud/ op 'I put on my hat' (kset)<sub>s</sub> (mən)<sub>s</sub> (hu)<sub>s</sub> (tɔp)<sub>s</sub>  
               \*(kset)<sub>s</sub> (mən)<sub>s</sub> (hu)<sub>s</sub> (dɔp)<sub>s</sub>

Thus the assumption of a block of postcyclic lexical rules is well motivated.

## 2. Final Devoicing and subject pronouns

Most of the subject pronouns of Dutch have a strong and a weak form. The forms that interest us here are the vowel-initial weak forms. The clearest example is *ie* [i], the weak counterpart of *hij* 'he'. This pronoun is cliticized to the preceding word in COMP position (Den Besten 1976), and fuses phonologically with this preceding word, which is clear from the resulting syllabification pattern:

- (7) *main clauses*  
 vraagt ie 'lit. asks he' (vrax)<sub>s</sub> (ti)<sub>s</sub>  
       *subordinate clauses*  
 ... dat ie 'that he' (dɑ)<sub>s</sub> (ti)<sub>s</sub>

A second example is [ɔk], a weak variant of *ik* 'I' which behaves in the same way as *ie*.<sup>3</sup> For instance, the syllable structure of *dat-ik* is (dɑ) (tɔk). Since these clitics induce obligatory resyllabification, we find another argument here for locating Final Devoicing in the lexicon: Final Devoicing has to apply

before the syntactic rule of cliticisation and its concomitant resyllabification. This is illustrated in (8):

(8)	vond-ik	vond-ie	'lit. found I/he'
Lexicon: underl. form	/vɔnd/	/vɔnd/	
syllabification	(vɔnd) <sub>s</sub>	(vɔnd) <sub>s</sub>	
Final Devoicing	t <sub>s</sub>	t <sub>s</sub>	
Syntax: cliticisation	-ək	-i	
Resyllabification:	(vɔn) <sub>s</sub> (tək) <sub>s</sub>	(vɔn) <sub>s</sub> (ti) <sub>s</sub>	

If Final Devoicing applied after cliticisation, the incorrect phonetic forms \* [vɔndək] and \*[vɔndi] would be derived.

#### . Lexicalized forms

In Berendsen(1983) it is argued that Final Devoicing applies after cliticisation because of the existence of phonetic forms such as [hɛbək] for heb-ik 'lit. have I':

(9)	cliticisation and resyllabification	/hɛb ək/
Final Devoicing		(hɛ) <sub>s</sub> (bək) <sub>s</sub>
phonetic form		(hɛ) <sub>s</sub> (bək) <sub>s</sub>

Obviously, this analysis conflicts with the analysis proposed in the preceding sections, and therefore I will discuss Berendsen's analysis in some more detail. First, I will give a short survey of the relevant facts:

(a) Word-final /d/'s are always devoiced before a vowel-initial clitic, except for had-ik 'had I' where the /d/ can remain voiced:

(10)	bind-ik/ie	bɪntək, bɪnti	* bɪndək	* bɪndi
	raad-ik/ie	ratək, rati	* radək	* radi
	had-ik/ie	hɑtək, hɑti	hɑdək	* hɑdi

(b) There are a few verbs with stem-final /b/, e.g. tobben 'to toil', krabben 'to scratch', schrobben 'to scrub' and hebben 'to have'. Although my intuitions are not very clear here, it is at least certain that the variant with the voiceless obstruent is a possible one.<sup>4</sup>

(c) With respect to verbs with stem-final underlying voiced fricatives, again intuitions vary. This is certainly related to the fact that the voiced-voiceless opposition in fricatives is on the verge of disappearing, in favour of the voiceless segment. Again, what can be said at least is that phonetic forms with the voiceless obstruent are correct, e.g. gaf-ik [ɣɑfək], gaf-ie [ɣɑfi], although perhaps forms like [ɣɑvək] and [ɣɑvi] are also possible.

Given these data, Berendsen's analysis runs into the following problems:

(a) The phonetic forms with voiceless obstruents cannot be derived.

(b) For phrases like vond-ik an incorrect phonetic form is predicted.

The fact that the phonetic form of, for instance, vond-ie is [vɔnti], not [vɔndi] is also observed by Berendsen. He proposes to derive the correct phonetic form as follows:

(a) The clitic -ie is derived phonologically from the 3<sup>rd</sup> pers. sg. pronoun die that also occurs after verbs. For instance, kwam-die 'came he' is possible besides kwam-ie.

(b) The initial d's of Dutch pronouns have the special property that they behave like fricatives with respect to Progressive Voice Assimilation. Berendsen therefore assumes that they are underlying dental fricatives /ð/.

(c) There is a phonological rule that turns /dð/ into [t].

Thus, the phonetic form of stond-ie is derived as follows:

(11)		stond	i
	dδ → t	∅	t
	δi → i		
	phonetic form	[stɔnti]	

The disadvantages of this analysis are the following. First, an ad hoc rule 'dδ → t' has to be postulated. Second, -ie is derived from die although there is no independently motivated phonological rule to account for this. Generally, the weak forms of pronouns cannot be derived from their strong counterparts by means of phonological rules.

On the other hand, the analysis outlined in the preceding sections predicts phonetic forms like [stɔnti] straightforwardly, without any additional assumption, both from the variant with -ie and that with die:

(12)	Lexicon:	/stɔnd/	/stɔnd/
	syllabification	(stɔnd)	(stɔnd) <sub>s</sub>
	Final Devoicing	t	t <sub>s</sub>
	Syntax:		
	Cliticisation	i	di
	Phon. Component:		
	resyllabification	(stɔn) <sub>s</sub> (ti) <sub>s</sub>	(stɔnt) <sub>s</sub> (di) <sub>s</sub>
	Progr. Voice Assimilation <sup>5</sup>	-----	----- <sub>t</sub>
	Geminate Deletion	∅	∅
	phonetic form	(stɔn) <sub>s</sub> (ti) <sub>s</sub>	(stɔn) <sub>s</sub> (ti) <sub>s</sub>

The problem that remains to be dealt with is how phonetic forms such as [hɛbɔk] and [hɔdɔk] can be derived. I propose to consider such phonetic forms as lexicalized phrases that are stored in the lexicon. Apparently, the weak pronoun -ɔk can be reinterpreted as a kind of suffix, attached to the verb before Final Devoicing applies.

Interestingly, there is independent evidence for the assumption that verb-plus-clitic combinations have to be stored in the lexicon, since we find even more reduced phonetic forms of such combinations, in particular with frequent verbs like hebben 'to have', zijn 'to be' and the auxiliaries; these strongly reduced variants occur in casual and substandard variants of Dutch:

(13)	<i>Verb plus Clitic</i>	<i>Reduced form</i>
	heb ik 'have I'	hek
	ben ik 'am I'	benk
	kan ik 'can I'	kank
	wil ik 'want I'	wi(l)k
	zal ik 'will I'	za(l)k
	moet ik 'must I'	moek
	mag ik 'may I'	ma(g)k

It is impossible to derive such reduced forms by means of phonological rules of Dutch, and hence they have to be listed in the lexicon as possible lexicalizations of Verb-plus-Clitic combinations in syntactic structures.

A similar behaviour is shown by the complementizer dat: dat-ik can be realized as dak. In Dutch dialect we also find such compressed forms for dat and frequent verbs with other pronouns. The following data are from the dialect of Hoogeveen, Drenthe:

(14)	<i>dat + pronoun</i>	<i>reduced form</i>	<i>verb + pronoun</i>	<i>reduced form</i>
	dat jij	daj	heb je	hej
	dat hij	datie	heeft hij	hevvi
	dat we	daw	hebben we	hew
	dat jullie	daj	hebben jullie	hej
	dat ze	dase	hebben ze	hepse

The hypothesis that certain cliticised forms are stored in the lexicon also explains why there is variation with respect to the phonetic realization of verb-plus-clitic combinations with voiced verb-final obstruents among speakers of Dutch, since they might differ with respect to the forms they have stored in their individual lexicons. Generally, it seems to be the most frequent verbs that have these lexically stored cliticised forms.

What are the syntactic consequences of the hypothesis that cliticised forms are stored in the lexicon? One possibility is to assume that lexical insertion takes place at the level of S-structure since such forms are lexicalizations of syntactic configurations that arise through the application of a syntactic rule of cliticisation. Den Besten (1976) already pointed out that, thanks to the enrichment of S-structure with traces, lexical insertion can take place at this level. Anderson (1982) and Jensen and Stong-Jensen (1984) also assume this: in D-structure the labels of nodes are complexes of syntactic and morphological features. Syntactic rules (e.g. agreement rules) can add features. At S-structure level lexical items are inserted in their inflected form under the condition that their features are non-distinct from the nodes below which they are inserted. Another possibility is to insert such Verb-plus-Clitic combinations in D-structure. We then need some principle that marks these sentences as ungrammatical if the subject position is also filled with a lexical item. Such an analysis would proceed along the lines of current generative analyses of Pro-drop languages, in particular the analysis of McCloskey and Hale (1982) for Modern Irish. In this language, unlike the Romance Pro-drop languages, the presence of a synthetic verb that is marked for number and person excludes the filling of the subject position. However, I won't take any stand on this issue here. It suffices to note that the phonological analysis of clitics proposed above does not necessarily conflict with syntactic theory.<sup>7</sup>

In conclusion, the localization of Final Devoicing in the lexicon is supported by the data concerning the interaction of vowel-initial subject clitics with this rule. Thus, the importance of the distinction between word phonology and sentence phonology is once more confirmed.

#### Notes

1. In this paper I will leave out of discussion whether the block of cyclic phonological rules should be divided into two or more levels.
2. Kiparsky (1983) also recognizes a 'word level' at the end of the lexicon, where the requirement that lexical rules only apply in derived environments (the so-called Strict Cycle Condition) no longer holds. Kiparsky's view of the organization of the lexicon is different, though, since he assumes one component of phonological rules which apply in different ways at the different levels of grammar, for instance subject to the SSC at the cyclic level, and across-the-board at the word level. If one also assumes that syllabification rules do not create derived environments, Final Devoicing is blocked from applying at the cyclic level by the SSC, and is thus predicted to only apply postcyclically. However, Kiparsky also has to diacritically mark certain rules as applying only cyclically, i.e. always subject to the SSC. Therefore, I stick to the 'block-theory' in (1) since this model also predicts that all cyclic rules precede all postcyclic rules. See Booij and Rubach (1985) for

a more detailed analysis of this issue.

3. We also find forms such as (d&) (tIk) for dat-ik, but it is not clear whether the resyllabification in this form<sup>s</sup> is due<sup>s</sup> to cliticisation or the general re-syllabification across word boundaries that is characteristic of casual speech.
4. Berendsen (1983: 27) only mentions [kræbək] as the phonetic form of krab-ik.
5. I assume that the /d/'s of pronouns are positive exceptions to the rule of Progressive Voice Assimilation, but nothing hinges on this assumption.
6. A similar phenomenon occurs in English: Zwicky and Pullum (1983) have convincingly shown that the weak form of not, n't must be analyzed as a suffix that is added to words in the lexicon.
7. A logically possible, but more clumsy alternative is to insert lexical items at D-structure level, and to allow for a second lexical look-up in which syntactic combinations of words are replaced by their lexicalized counterparts that are stored in the lexicon.

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