

SANDHI VOICING AND OPACITY IN LIMBURG DIALECTS OF DUTCH:  
TOWARDS A FORMAL ACCOUNT

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1. The Rule<sup>1</sup>

Limburg dialects of Dutch have a rule for voicing final obstruents across word boundaries ('sandhi voicing') which, unlike other varieties of Dutch, also applies systematically before adjacent vowels.

As far as the prosodic domain is concerned: in a model in which a distinction is drawn between the prosodic constituents of, among other things, the prosodic word and the clitic group<sup>2</sup> (Nespor and Vogel 1986), the voicing can be said to apply at the boundaries between a prosodic word and a clitic element, be it enclitic (1a, b) or proclitic (1c):

- |     |    |                     |                       |                 |
|-----|----|---------------------|-----------------------|-----------------|
| (1) | a. | su[b]r <sup>3</sup> | <i>lit.</i> 'soup in' | 'into the soup' |
|     | b. | ɪ[z]ət              | 'is it'               | idem            |
|     | c. | ə[d]ɪs              | 'it is'               | idem            |

in short within the clitic group. It also occurs between prosodic words (1d),<sup>4</sup> between a clitic group and a prosodic word (1e) and between clitic groups (1f):

- |     |    |                 |                  |                                       |
|-----|----|-----------------|------------------|---------------------------------------|
| (1) | d. | u:[d]oəmə       | 'breath out'     | idem                                  |
|     |    | kɪrə[g]yl       | 'church owl'     | idem                                  |
|     |    | ka[g]oɔpəɾasi   | 'cheek surgery'  | idem                                  |
|     |    | də[d]ɔx         | 'that also'      | 'that too'                            |
|     |    | ʃtɾo:ə[d]y:əvər | 'street over'    | 'across the street'                   |
|     | e. | nəmə[d]ɔp       | 'name it up'     | 'name it'                             |
|     | f. | həuwe[d]əbok    | 'had she a book' | 'she had a book, did she have a book' |

and even between prosodic words at the boundaries of higher prosodic domains, such as phonological phrases (1g), *vid.*

<sup>1</sup> I would like to thank Ben Hermans and Marc van Oostendorp for their discussion of and their invaluable suggestions regarding earlier versions of this paper. I would also like to thank Kevin Wales for correcting my English. I alone am responsible for any shortcomings. The present version is built on Hinskens (2005).

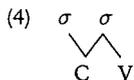
<sup>2</sup> I.e. a prosodic word, including dependent clitic elements—if any.

<sup>3</sup> The examples (in broad phonetic transcriptions) represent the dialect varieties which are traditionally spoken in Ubach over Worms, at the Dutch-German state border, between Heerlen and Kerkrade. Dialectologically, Ubach over Worms is located in the transition area between Ripuarian and East-Limburg dialects.

<sup>4</sup> Or, differently put, between clitic-less clitic groups.



Sandhi voicing requires resyllabification. Resyllabification links the final segment of the preceding syllable to the onser position, so that no default consonant [ʔ] needs to be inserted. This final segment then becomes ambisyllabic, cf. (4).



The structure in (4) seems to be the environment in which in these dialects this type of sandhi voicing occurs.

So in constellations of a word-final obstruent followed by a vowel-initial word, resyllabification-cum-sandhi voicing is an alternative for either final devoicing-cum-resyllabification, or glottal stop insertion-cum-final devoicing.

The Limburg facts regarding sandhi voicing seem to imply that at least in these dialects of Dutch resyllabification also operates postlexically, while according to Nespov and Vogel (1986, 66f.) in standard Dutch it is "impossible for syllables to group together segments that belong to separate words in a phrase". Since resyllabification is already operative in the lexical component, in the dialects at issue it has to be considered as a real 'anywhere rule' (cf. Vennemann 1972, 16).

## 2. An Exception

Considering that postlexical rules, after all 'ausnahmlöse Lautgesetze', do not allow lexical exceptions and apply automatically, it does come as a surprise to find obstinate exceptions of the type in (5):

- |     |    |            |             |                 |                 |
|-----|----|------------|-------------|-----------------|-----------------|
| (5) | a. | ɔpənəmat   | <i>lit.</i> | 'on the market' | 'at the market' |
|     | b. | ɔpənʃtroət |             | 'on the street' | 'in the street' |
|     | c. | ɔpəbet     |             | 'on the bed'    | idem            |

The blocking of the rule in (5) is remarkable as there is a word boundary with, at its left-hand side, a contrastively voiceless obstruent and, at its right-hand side, a vowel. Moreover, /ɔp/ and /ə(n(ə))/ constitute a clitic group. Nevertheless, voicing cannot take place at the word boundary (hence \*[ɔbət]).

What explains this opacity? Is the voicing rule, although it constitutes a sandhi phenomenon, not postlexical anyway? Or could there be postlexical rules which do not apply automatically? Or is there something else which prevents the sandhi voicing from occurring? In the next section all three possibilities will be discussed.

## 3. An Analysis

This particular voicing rule applies at word boundaries, so it must be postlexical in nature. However, it applies only to derived structures (in *casu* postlexically derived ambisyllabic obstruents, cf. (4)), which is rather a property of lexical rules. And while postlexical rules are assumed to be blind to grammatical (including word-internal) structure, this process does not seem to be so, witness the fact that it does not occur at word internal morpheme boundaries. This holds true for both flexion (6a) and derivation (6b):

- (6) a. apə – \*a[b]ə                    ‘monkeys’  
       ʃloəpə – \*ʃloə[b]ə                ‘[to] sleep’  
       b. wɪrəkəR – \*wɪrə[g]əR        ‘worker’  
       ekɪç – \*e[g]ɪç                    ‘angular, craggy, jagged’

However, in the case of the voicing process at issue, it is not the grammatical word, but the prosodic word that counts; the grammatical words in (6a–b) do not consist of several prosodic words, nor of a prosodic word and a clitic, and neither of a clitic and a prosodic word. As shown by (1a) to (1g) in section 1 above, this voicing is a domain juncture rule (Selkirk 1980, Nespor and Vogel 1986), which applies at the juncture of prosodic words that are part of the same intonational phrase.

This explains why sandhi voicing occurs in derived words such as

- (7) a. ko[g]ɪn                    ‘cook–FEM’                    ‘female chef, female cook’  
       ʃe[v]ɪn                    ‘boss–FEM’                    ‘female boss’

The suffix *–in/*, which bears primary stress in all varieties of Dutch, constitutes a foot of its own and behaves as an autonomous prosodic word. This also holds for e.g. *–εçɪç/*, the equivalent of German *–artig* and English *–y*, also a non-cohering suffix which also behaves as an autonomous prosodic word (cf. Booij 1995, 47):

- (7) b. vɪ[ç]εçɪç                    ‘fishy’

In short, in these dialects, sandhi voicing operates postlexically, although it does have a lexical property, viz. the fact that it operates on derived ambisyllabic obstruents.

In general there are no indications to support the hypothesis that certain post-lexical rules do not apply automatically, although there can be tendential differences in the extent of application of such rules between different style levels. This applies to e.g. French liaison, although in its application the stylistic variation is ultimately linked to the size of the prosodic domain (cf. van Oostendorp 1997, 210–213).

In cases such as those considered in (5) something else appears to be the case. In these instances the voicing is blocked by an empty position which corresponds to the initial segment of the definite article

## (8) (ɣ)ə(n(ə))

the use of which is decreasing rapidly as a result of dialect levelling. This article, which seems to have developed out of a demonstrative, is merely used after prepositions of location or direction such as /ɔp/ 'on', /u:t/ 'out', /noə ~ nɔ/ 'to, towards', /ɪn ~ ɪ/ 'in', /van ~ va/ 'of, from', /a ~ an ~ a/ 'at, on', /ɣm/ 'om', /vy:ər/ 'voor', and /lanʃ/ 'along, via'. In all other cases, the 'elsewhere' definite article /dər/ masc, /də/ fem, or /ət/ neuter is used.

The form of this article is both morphologically and phonologically determined. The choice between the three expansions of the part /ə(n(ə))/ is determined by the grammatical gender of the noun:

(9) a.		<i>full</i>	<i>reduced</i>
	masc	ɣə	ənə
	fem	ɣə	ən
	neuter <sup>6</sup>	ɣə	ə

cf. the indefinite article, which also has two forms: the full form (which is identical to the numeral) and the reduced clitic form:

(9) b.		<i>full</i>	<i>reduced</i>
	masc	ɪnə	ənə
	fem	ɪŋ	ən
	neuter	e:	ə

The variation between the full, fricative-initial and the reduced, fricative-less forms of the definite article /ɣənə/ is allomorphic: the fricative-less forms /ənə/ only—variably—occur after /ɔp/ 'on',<sup>7</sup> the fricative-initial forms after /m/ as in /ɣm/ 'om', /n/ as in /an/ 'at, on', /r/ as in /vy:ər/ 'voor', /s/ as in /lanʃ/ 'along', /t/ as in /u:t/ 'out'. Also after a vowel, as in e.g. [ɪ] 'in', [a] 'at, on' and [va] 'from', only fricative-initial forms occur:

<sup>6</sup> Unless the following noun—also if it is grammatically neuter—has a /d/ in initial position, as in e.g.

(10a)	*ɣəðɔ:ɾəp – ɣəndɔ:ɾəp	'in the village'
	*ɔpəɖak – ɔpəndak	'at the roof'

cf. Hinskens (to appear). Also before h-initial nouns (independent of their gender, hence including neutre ones such as e.g. /hʉs/ 'house') the n-final form of this article is used:

(10a)	*vy:ərɣhʉs – vy:ərɣənʉs	'in front of the house'
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<sup>7</sup> According to Jongeneel (1884, 39), in the Heerlen dialect of around 1880 the fricative could also be deleted following the prepositions *doer* and *noa* (Jongeneels transliteration), i.e. /du:ər/ 'through' and /noə/, but in the dialect varieties spoken in Ubach over Worms of the second half of the twentieth century variable ɣ-deletion only occurs following /ɔp/.

(11)	vəʔənəʔyɪdər	'from the attic'	masc
	aʔəndy:ər	'at the door'	fem
	ɪʔəbet	'in (the) bed'	neuter

Whenever the fricative-less allomorph of /ʔənə/ does not occur, sandhi voicing applies before an adjacent vowel. This appears—among other things—from the existence of minimal pairs such as

(5)	a.	ɔpənəmat	'at the market'	
	d.	ɔbənəmat	'at a market'	with indefinite article masc /ənə/
	b.	ɔpənʃtrəət	'in the street'	
	e.	ɔbənʃtrəət	'in a street'	with indefinite article fem /ən/
	c.	ɔpəbet	'on the bed'	
	f.	ɔbəbet	'on a bed'	with indefinite article neuter /ə/

In (5a, b, c) the reduced, fricative-less allomorphs of /ʔənə/ are used; obviously, it is the empty position resulting from the deletion of the /ʔ/ which blocks sandhi voicing.

The assumption that, in these dialects, empty positions block sandhi voicing is also supported by the fact that voicing is excluded before clitic forms of consonant-initial personal pronouns. Vid.

(12)	a.	bɪstu:	'are you'	/du/ full form
		bɪsə – *bɪzə		/ə/ maximally reduced clitic form
		dastu:	'that you' <sup>8</sup>	
		dasə – *dazə		
	b.	ɪshe:ə	'is he'	/he:ə/ full form
		ɪsə – *ɪzə		/ə/ maximally reduced clitic form
		dathe:ə	'that he'	
		datə – *dadə		

while, on the other hand, voicing is categorical before the clitic forms of vowel-initial personal pronouns:

(12)	c.	zɪʔi:ər ~ zɪdi:ər	'are YOU-REV or -PL'	/iəR/ full form
		*zɪtər – zɪdər		/ə/ maximally reduced clitic form
		dətʔi:ər ~ dadi:ər		
		*datər – dadər		

<sup>8</sup> We will not discuss the absence of the /t/ in [das]; neither will we dwell upon the origin of the inflectional /s/. The [t] in the full form of the pronoun results from progressive assimilation, but this is irrelevant for the present topic.

## 4. Towards a Formal Account

The opacity which is illustrated in (5a, b, c) and (12a, b) is caused by an empty position which blocks the sandhi voicing—cf. Goyvaerts' (1980) 'phantom segment'. The examples above show once again that phonetically empty positions can have phonological effects. The question is: how can this be accounted formally?

The formal account should solve the following dilemma. On the one hand, by their very nature, sandhi rules apply postlexically. In the framework of Lexical Phonology, after each step in the derivation, all 'diacritics', including the ones indicating grammatical boundaries, as well as traces of deleted segments, are erased. On the other hand, the postlexical rule for sandhi voicing in these dialects is blocked in environments preceding a deleted segment.

It looks as though the fact

- (13) a. that the reduced, fricative-less allomorphs /ənə/ of the definite article can—but do not need to—occur after the /p/ in the preposition /ɔp/, and  
 b. that in this constellation the /p/ does not undergo sandhi voicing

can be captured by Hayes's (1990) precompiled phonological rule, i.e. a lexical phonological rule "whose application is constrained by lexically specified syntactic frames" (Inkelas and Zec 1990, xv). This rule type, which refers directly to syntax, deals with the residue of cases that are not subject to prosodic conditioning. However, they "do not refer to the syntax proper, but only to a lexicalized syntactic frame" (Asudeh and Klein 2001, 22). In other words, the effects of the (morpho-)syntactic context are precompiled in the lexical component. In this approach, "phonologically idiosyncratic items can be inserted into a phrasal context, subject to subcategorisation frames which freely make reference to phonological, morphological, and syntactic properties of the environment" (Crysmann 2001, 3). These frames condition lexical phonological rules. In line with the architecture of Lexical Phonology, precompiled rules precede post-lexical or 'phrasal' rules and they may precede other lexical rules, thus Hayes (1990, 97f.), who also points out: "If we assume [...] that traces and other empty categories are deleted prior to true phrasal phonology, then sensitivity to empty categories diagnoses a precompiled rule" (1990, 107).

For the present case the frame for the blocking of the sandhi voicing rule might roughly look as follows:

- (14) *Frame 1*                    /ɔp/ → [ɔp] / [ \_\_\_ [ t [ə(n(ə))] ]<sub>Def.Art</sub> [...] ]<sub>N</sub> ]<sub>PP</sub>

In this frame, the phonetic form of the preposition (marked by the relevant transcription symbols between square brackets in the structural change part of the rule) expresses the fact that sandhi voicing does not apply, and the *t* (trace) marks the deleted initial segment of the full form of this definite article.

As was shown in section 3 above, there are other relevant prepositions ending in an obstruent, such as /ut/ 'out' and /laŋs/ 'along, via', or (more specifically) ending

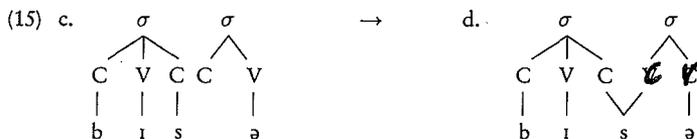
in a plosive, namely /u:t/ 'out', which require the article /ɣənə/. There is another relevant preposition ending in a nasal, viz. /ɣm/ 'om', which requires the article /ɣənə/. None of these prepositions ever occur with the fricative-less forms of /ɣənə/, as they can only occur with the forms with the velar fricative. Consequently, as shown in (14), the frame for a possible blocking rule is not just syntactically specified, but also makes reference to a specific lexeme; thus it has an unsatisfactorily incidental nature which seems to be at odds with Hayes's conception of precompiled rules. The fact that (14) blocks rather than instantiates sandhi voicing, and the fact that in this approach sandhi voicing itself is bluntly treated as a lexical rule,<sup>9</sup> are additional indications that lexical precompilation is probably not the mechanism at work here.

Moreover, sandhi voicing is not only blocked before the fricative-less forms of /ɣənə/, as in (5a, b, c). Sandhi voicing is also excluded before clitic forms of consonant-initial personal pronouns, as in (12a, b). What could a unitary formal account look like?

Let us begin with a partial representation of both types, the fricative-less allomorphs of /ɣənə/.



and clitic forms of consonant-initial personal pronouns, in this case of /tə/ < /du:/



In both cases, there is a variably deleted segment in (15a, c); this is formally expressed through the fact that the segment is not linked to its timing slot, which is thus empty. At the melodic tier, this timing slot contains substance, i.e. phonological features (not shown here); the phonological features are phonetically realized when the segment does get realized i.e. if the segment is linked to the next higher node in the prosodic hierarchy, in this case timing slot C. When the segment *does not* get realized, it remains covert and thus 'invisible' and the final segment of the preceding syllable is linked to the empty C-slot, thus becoming ambisyllabic (15b, d). No sandhi voicing occurs.

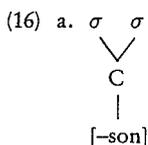
With sandhi voicing as e.g. in (5d), on the other hand, we find structures such as

<sup>9</sup> While it is a postlexical process which has a lexical property, as was shown in section 3 above.

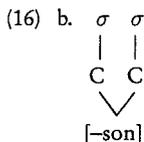


Here sandhi voicing applies automatically. In this type of a constellation, the final segment of the preceding syllable also becomes ambisyllabic. But unlike the cases in which sandhi voicing is blocked, here the ambisyllabic segment fills only one C position.

It appears that derived ambisyllabic obstruents only undergo sandhi voicing if they are singletons;



cf. (4) above. However, ambisyllabic geminates



resist the sandhi voicing. The fact that gemination blocks sandhi voicing agrees with the fact that voiced geminates are typologically rare. Voiced geminate stops, for instance, have been reported to occur in only a few languages, compared to their voiceless counterparts (Hayes and Steriade 2004).

In the above account, the blocking of sandhi voicing is entirely rooted in the phonological structure; it is not a matter of lexically stored syntax, as is the case in precompiled phrasal phonology.

It looks as though the observation in (13b), i.e. facts of the type in (5a, b, c), as well as facts of the type in (12a, b) can be accounted for through phonological structure. However, we do not as yet have an account of the allomorphy in /ɣənə/, i.e. of the optional deletion of /ɣ/ after the preposition /ɔp/ and only there, as summarized in (13a). Is it because /p/ and /ɣ/ are both obstruents while their places of articulation are maximally apart? Are there independent facts (in these dialects) which make such an explanation plausible? For now, this piece of the puzzle remains unsolved.

### 5. In Conclusion

This type of approach to dialect variation does justice to the grammatical complexity of a dialect, while at the same time yielding food for thought for adherents of formal linguistic theories.

Though a few questions remain unanswered, it is my great pleasure to dedicate the above analyses and considerations to Günther Öhlschläger, who was a distinguished colleague of mine in the German Department of the University of Leipzig. May he live long and prosper.

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