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Clitics and voicing in Dutch*

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1. Introduction

This paper considers the interaction of voicing processes and clitic attachment in Dutch. This forms a challenge to phonological theories since clitic attachment shows opaque interaction with final devoicing, and in addition voice assimilation in cliticized structures is subject to variation.

I propose a two-level Optimality Theory (OT) analysis (Prince and Smolensky 1993, Kiparsky 2000) of these data, in which the existence of two levels can handle the opaque interaction, and a combination of prosodic structure constraints and segmental constrains accounts for the attested variation. I will compare my analysis to two previous accounts for these data, those of Booij (1995, 1996, 1997) and Grijzenhout and Krämer (2000). Booij's work is formulated in the framework of rule-based Lexical Phonology, while that of Grijzenhout and Krämer is a single-level OT theory. I will argue that the former theory is unsatisfactory because of theoretical problems, mainly because it stipulatively assigns prosodic structures to cliticization structures. My proposal does not have this problem because prosodic structures are derived in the normal manner, from violable constraints on the well-formedness of prosodic structure (the Strict Layer Hypothesis, Itô and Mester 1992,

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Selkirk 2004). On the other hand, I will show that Grijzenhout and Krämer's (2000) theory has some empirical shortcomings: it does not derive all data, whereas my analysis derives these problematic data in a regular way. Hence, as I hope to show, the proposal I put forward in this paper, which combines insights from both Booij's work and that of Grijzenhout and Krämer, is superior to either theory. This not only offers an account for the Dutch data, but on a more conceptual level also illustrates how constraints on prosodic structure and traditional segmental constraints can work together to describe empirical findings such as variation.

The structure of the paper is as follows. Section 2 will introduce the general voicing processes that apply in Dutch and explicate the set of Dutch clitics, and subsequently present the main data of how clitic attachment interacts with these voicing processes. In section 3, I present my proposal for the case of final devoicing, and contrasts it with the two earlier accounts. Section 4 explains how my proposal works for voice assimilation data, again compared to previous theories. Section 5 concludes.

2. Main data

2.1. Voicing processes in Dutch

Voicing phenomena in Dutch have been well studied and described in the literature (e.g. van de Weijer and van der Torre 2007). The major processes are final devoicing and voice assimilation.[1]

Final devoicing

Obstruents are devoiced before word boundaries (1a) and in compounds (1b). Certain affixes, sometimes called semisuffixes (Grijzenhout and Krämer 2000), also induce final devoicing (1c), while others do not (sometimes called internal suffixes, Grijzenhout and Krämer 2000), (1d).

(1) a. /bɛd/ ⟶ [bɛt] 'bed'
b. /(loːd)$_{N}$(ɛrts)$_{N}$/ ⟶ [loːt.ɛrts] 'lead ore'
c. /roːd+ɑxtəx$_{Affix}$/ ⟶ [rɔːtɑxtəx] 'red-ish'
d. /roːd+ər$_{Affix}$/ ⟶ [rɔːdər] 'more red')

Progressive voice assimilation

Voice assimilation is progressive when the right member of a cluster is a fricative. This is illustrated in (2) for compounds and derived words:

[1] There are some other processes, such as intervocalic voicing (also known as 'Fricative Voicing', see Booij 1995: 147). This process is much more erratic, subject to variation, and most likely related to frequency effects (see Booij 1996: 236). I will not consider this process here in relation with cliticization, other than some brief comments in section 5.

(2) a. /ʋɛrk+zaːm/ ⟶ [ʋɛrksaːm] ‘active’

b. /(pɔst)$_{N}$(vɑk)$_{N}$/ ⟶ [pɔstfɑk] ‘mailbox’

Regressive voice assimilation

Voice assimilation is regressive when the right member of a cluster is a stop.

(3) a. /eːt+baːr/ ⟶ [eːdbaːr] ‘edible’

b. /(ɦɑnd)$_{N}$(pɛrs)$_{N}$/ ⟶ [ɦɑntpɛrs] ‘hand-press’

For more detailed discussion of these and other processes, as well as a general overview of Dutch phonology, I refer the reader to Booij (1995).

2.2. Clitics

Dutch has pronominal and adverbial clitics. Pronominal clitics, which are the most numerous, are reduced forms of pronouns. Whereas full-fledged pronouns are regular words with a full vowel that may receive stress, pronominal clitics are reduced variants of them. Most of them have a schwa vowel and accordingly they cannot be stressed and must attach to a host.

In (4) I present an overview of the most common Dutch clitics, together with the full forms they derive from. I have listed the [d]-initial clitics separately, since they share some special properties that will be discussed later (Lahiri *et al.* 1990 focus exclusively on these types of clitics).

(4)

/Cə/ *clitics*		
Full form	Clitic	
/mɛi/	/mə/	‘me’
/jɛi/	/jə/	‘you’
/jɔu/	/jə/	‘your’
/zɛi/	/zə/	‘them’ / ‘she’
/ʋɛi/	/ʋə/	‘we’

/əC/ *clitics*		
Full form	Clitic	
/ən/	/ən/	‘a’
/ɦɛt/	/ət/	‘it’ / ‘the’
/ɪk/	/ɪk/	‘I’
/ɦɛm/	/əm/	‘him’
/eːns/	/əs/	‘once’

[d]-*initial clitics*		
Full form	Clitic	
/ɦaːr/	/dər/	‘her’
/ɦɛi/	/di/	‘he’
/ɛr/	/dər/	‘there’

closed clitics		
Full form	Clitic	
/mɛin/	/mən/	‘my’
/zɛin/	/zən/	‘his’

2.3. Main data: interaction of clitics and voicing

Final devoicing

The interaction of cliticization and final devoicing shows counterfeeding opacity with respect to resyllabification: although in the output form of (5b) the underlying [v] is now in onset position, it is still devoiced.

(5) a. /ɣeːv+ət$_{\text{Clitic}}$/ ⟶ [ɣeː.fət] ‘give it’
b. /rɛd+əm$_{\text{Clitic}}$/ ⟶ [rɛ.təm] ‘save him’
c. /koːp+ət$_{\text{Clitic}}$/ ⟶ [koː.pət] ‘buy it’

Progressive assimilation

When a fricative-initial clitic attachment creates a consonant cluster, progressive assimilation takes place. Examples (6bc) show that final devoicing feeds progressive assimilation.

(6) a. /trɛf+zə$_{\text{Clitic}}$/ ⟶ [trɛf.sə] ‘meet them’
b. /ɣeːv+zə$_{\text{Clitic}}$/ ⟶ [ɣeːf.sə] ‘give them’
c. /rɛd+zə$_{\text{Clitic}}$/ ⟶ [rɛt.sə] ‘save them’

Regressive assimilation

The [d]-initial clitics are the only clitics that have a voiced stop in their onset. In this case, we find variation: the voiced cluster may optionally be devoiced.

(7) a. *geef d’r* /ɣeːv+dər$_{\text{Clitic}}$/ ⟶ [ɣeːv.dər] or [ɣeːf.tər] ‘give her’
b. *(ik) zoek d’r (auto)* /zuk+dər/ ⟶ [zugdər] or [zuktər] ‘(I) look for her (car)’
c. *kies d’r* /kiz+dər/ ⟶ [kistər] or [kizdər] ‘choose her’

I now to turn to the analysis of these data, first the final devoicing data in section 3, followed by the voice assimilation data in section 4.

3. Final devoicing

Booij’s analysis (1995, 1996, 1997) overcomes the opacity problem of final devoicing by presenting an analysis in the framework of Lexical Phonology. The main tenet of this theory is that there are distinct levels (a Lexical level and a Postlexical level) that each come with their own set of (morphological) word-formation rules (WFRs) and a set of phonological rules. These rules apply only in the domain of

their own level, and the output of one level serves as the input for the next level. The basic assumption for Booij's application of Lexical Phonology to the current data is that final devoicing is a lexical rule that devoices codas, while cliticization occurs postlexically and induces resyllabification.

For example, /ɣeːv/ 'give' is devoiced at the Lexical level [ɣeːf], then the clitic is attached at the Postlexical level, and resyllabification takes place: [ɣeː.fət].

(8) *Booij's (1995) derivation of* /ɣeːv+ət$_{\text{Clitic}}$/ 'give it' *and* /ɣeːv+ər$_{\text{Affix}}$/ 'someone who gives':

			/ɣeːv/+/ət$_{\text{Cl}}$/	/ɣeːv/+/ər$_{\text{Aff}}$/
LL	WFRs	Affixation	———	[ɣeːvər]
	Phonological rules	Syllabification	[ɣeːv]	[ɣeː.vər]
		Final devoicing	[ɣeːf]	———
PL	WFRs	Cliticization	[ɣeːfət]	———
	Phonological rules	Resyllabification	[ɣeː.fət]	———

(LL = Lexical level, PL = Postlexical level)

My proposal adopts Booij's basic idea, but cast in terms of two-level Optimality Theory (OT, Kiparsky 2000). Two-level OT also assumes a Lexical and a Postlexical level, each of which comes with its own constraint ranking. Again, the output of one level is the input of the following level. An earlier, single-level OT analysis of the current data is Grijzenhout and Krämer (2000). They employ a *[+voice])$_{\omega}$ constraint to account for the basic devoicing data: words, compound components and semisuffixes form their own prosodic word, while internal affixes incorporate into the prosodic word of their host, generating the data in (1).

Grijzenhout and Krämer further introduce Alignment constraints to derive prosodic structures:

(9) ALIGN-R(PWd): Align the right edge of every prosodic word with the right edge of some lexical word (N, V or A).

(10) ALIGN-L(Stem): Align the left edge of every stem with the left edge of some prosodic word.

In my proposal I adopt G&K's *[+voice])$_{\omega}$ constraint, which is high ranked at the Lexical level. This gives us the basic (non-clitic) data. Throughout the paper, in linear representations, I adopt the typographical convention that prosodic words are indicated by parentheses, and lexical words by vertical bars. If one level is irrelevant for a derivation (e.g., the Postlexical level for (11–12)) I will not give its tableau.

(11)

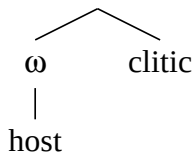
	LEXICAL		
	/bɛd/ 'bed'	*[+voice])$_{\omega}$	ID([voice])
a.	|(bɛd)|	*!	
b. ☞	|(bɛt)|		*

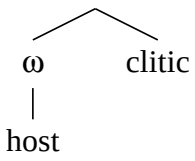
(12)

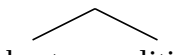
	LEXICAL				
	/rɛd+ər$_{\text{Affix}}$/ 'save her'	ALIGN(PWd,R;Stem,R)	*[+voice])$_{\omega}$	ONSET	ID([voice])
a.	|(rɛ).dər|	*!			
b.	|(rɛd.ər)|			*!	
c. ☞	|(rɛ.dər)|				
d.	|(rɛ.tər)|				*!

When we consider the analysis of cliticized words, the details of the prosodic structure are of great importance. In principle, there are three basic structures available for cliticization. The clitic may attach to the prosodic word of the host and form a new prosodic word (13a), attach to the prosodic word to form a phonological phrase (13b), or incorporate into the prosodic word, as in (13c).

(13)

a.


b.


c.


Prosodic structure also sets apart Booij's theory on the one hand and Grijzenhout and Krämer's analysis and my proposal on the other. In Booij's analysis, the prosodic structures must be explicitly stipulated, and any conflicts with structural well-formedness conditions (e.g. the Strict Layer Hypothesis, see (16)) must be explained away. To give an example, Booij (1996) argues for structure (13c) for enclitics, but has to make the stipulation that Dutch words can sometimes have ternary feet, instead of the "universally preferred" binary feet (p. 230). However, more than two Dutch clitics can stack up, requiring additional explanations for even larger feet:

(14) [wanneer ik 't 'm] vertel [ʋɑneːrɪkətəm]
when I it him tell
'when I report it to him'

More recently, the Strict Layer Hypothesis has been recast in terms of violable OT constraints (Itô and Mester 1992, Selkirk 2004). This makes it possible to derive prosodic structures in a regular manner from constraint ranking, without the need for ad-hoc stipulation.

(15) *Prosodic Hierarchy*
Utterance (Utt) – Intonational Phrase (IP) – Phonological Phrase (ϕ) – Phonological Word (ω) – Foot (F) – Syllable (σ)

(16) *Strict Layer Hypothesis*
The categories of the Prosodic Hierarchy are enumerated from C_6 (utterance) to C_1 (syllable).

LAYEREDNESS	No C_i dominates a C_j when $j > i$;
HEADEDNESS	Any C_i must dominate a C_{i-1}, for $i > 1$;
NON-RECURSIVITY	No C_i dominates another C_i;
EXHAUSTIVITY	No C_i immediately dominates a C_k, when $k < i-1$.

Using these constraints, we can derive the final devoicing opacity we found in cliticization structure. In the example /ɣeːv/+/ət/ 'give it', final devoicing of the stem first applies at the Lexical level, in the manner described above. At the Postlexical level, the ranking of non-recursivity of prosodic words (NONREC$_\omega$) and exhaustivity of phonological phrases (EXH$_\phi$) derives structure (13c). Furthermore, a standard ONSET constraint yields the correct syllabification, resulting in (17d) as the winner.

(17)

POSTLEXICAL					
	/ɣeːf/+/ət/	NONREC$_\omega$	EXH$_\phi$	ONSET	ID([voice])
a.	|((ɣeː.f)|.ət)	*!		*	
b.	|(ɣeːf)|.ət		*!	*	
c.	|(ɣeːf|.ət)			*!	
d. ☞	|(ɣeː.f|ət)				
e.	|(ɣeː.v|ət)				*!

Grijzenhout and Krämer's (2000) also derives the right winner in (17), but by other means: they use Alignment constraints of the type in (9–10). However, this analysis fails for verb stems with a complex coda, like /ʋɔrd/ 'become'. The attested form is /ʋɔrd+ət/ ⟶ [ʋɔr.tət], in which resyllabification breaks up the complex coda. However, Grijzenhout and Krämer's theory incorrectly predicts *[ʋɔrt.ət] 'becomes

it', violating ONSET. The tableau (18) shows how the unattested form (18b) (indicated by a bomb symbol) is derived, rather than the attested form (18e) (unhappy face).

(18) *Grijzenhout and Krämer's (2000) tableau incorrectly predicting [vɔrt.ət]*

		/vɔrd+ət$_{Clitic}$/	ALIGN-R(PWd)	*[+voice])$_{ω}$	ONSET
a.		|(vɔrd)|.ət		*!	*
b.	💣	|(vɔrt)|.ət			*
c.		|(vɔrd|.ət)	*!		*
d.		|(vɔr).d|ət	*!		
e.	☹	|(vɔr).t|ət	*!		

The alignment constraints make the prosodic and lexical word coincide, which results in the wrong syllabification. There is much more to say about syllabification in Dutch than space allows here. Dutch is usually analyzed as having the Minimal Rhyme Constraint (MRC, Booij 1995: 31), requiring the rhyme of a syllable to constitute at least two moras. Consequently ambisyllabic segments are predicted. Although Grijzenhout and Krämer apparently adopt this analysis (p. 77), they include no constraints to this effect in their analysis. It is straightforward to add OT constraints to my analysis (MRC, and a markedness constraint *AMBISYLLABIC).

In addition, Grijzenhout and Krämer (2000: 77) claim that "there is no reliable means" to determine the syllabic position of stem-final consonants in clitic structures such as [ɣeːvət] 'give it'. Still, they allow the syllabification [vɔrt.ət] 'becomes it', which violates the widely-assumed constraint that syllables cannot have an initial schwa (see e.g. Booij 1995: 169). Grijzenhout and Krämer (1999) report an informal investigation of syllabification in which native speakers were asked to syllabify a small number of host+clitic combinations. Although this did not include hosts with a complex coda such as /vɔrd/ 'become', they conclude that resyllabification does not take place in those cases. They took this experiment as support for their theoretical claims on syllabification, but they did not consider several confounding factors, such as the potential role of orthography (clitics are written as separate words in Dutch). A perception experiment, in which speakers are asked to judge given syllabifications, might be more insightful.

Leaving these issues aside, I assume [vɔr.tət] is the correct form. This is indeed derived regularly in my analysis. Final devoicing takes place at the Lexical level, resulting in the output [vɔrt], subsequently the Postlexical computation proceeds as follows:

(19)

	POSTLEXICAL				
		/vɔrt/+/ət/	EXH$_\phi$	ONSET	ID([voice])
a.		|(vɔr).t|ət	*!		
b.		|(vɔrt)|.ət	*!	*	
c.	☞	|(vɔr.t|ət)			
d.		|(vɔrt|.ət)		*!	
e.		|(vɔr.d|ət)			*!

The exhaustivity constraint EXH$_\phi$ forbids structures (19ab) in which the clitic directly attaches to the phonological phrase level, 'skipping' the prosodic word.

Before turning to the voice assimilation data in section 4, let me summarize what we have found so-far. The analysis put forward in this section incorporates elements of both Booij's and Grijzenhout and Krämer's analyses. However, it overcomes problems that both theories have. My analysis has a theoretical advantage over Booij's because prosodic structures are derived in a regular way by means of prosodic wellformedness constraints from the Strict Layer Hypothesis (16). In contrast, Booij needs to stipulate and explain why the morphological structure of clitics has a certain prosodic structure and not another.

My analysis has an empirical advantage over Grijzenhout and Krämer's analysis. As I have argued, their analysis does not yield the right result for verb stems with a complex coda (see tableau in (18)), but it is derived regularly in my proposal.

4. Voice assimilation

4.1. Variation with regressive assimilation

The main challenge for phonological theories in accounting for the data on voice assimilation is the attested variation with respect to regressive assimilation in [d]-initial clitics, as in (7b), repeated below.

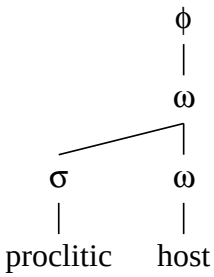
(7b) *(ik) zoek d'r (auto)* /zuk+dər/ ⟶ [zuktər] or [zugdər]
'I am looking for her car'

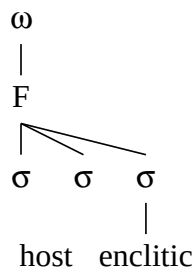
Although no quantitative data are available for this type of variation,[2] we can account for variation in OT by positing a variable constraint ranking: two constraints can be ranked freely, with the two orders generating the two variants. This can be made more explicit in frameworks such as Stochastic OT (Boersma 1998) and MaxEnt OT (Goldwater and Johnson 2003) in which constraints are assigned weights, which in turn determines the probability for certain rankings over others.

Earlier theories have analyzed the two variants in (7b) as representing two different prosodic structures for cliticization. For instance, Booij (1995, 1996, 1997)

[2] But see Ernestus (2000) for other corpus research on voicing processes in Dutch.

assumes different structures for enclitics and proclitics:[3]

(20) a. 

b. 

Booij (1995) uses this difference to explain the variation in (7b): a clitic can either incorporate into the prosodic word of a preceding host, or attach to the prosodic word of a following host. These options give rise to different voicing behavior because of a domain span rule:[4]

(21) *Word-internal devoicing* (Booij 1995: 177)

$[-\text{son}] \longrightarrow [-\text{voice}] \,/\, \left[\begin{smallmatrix}-\text{son}\\-\text{voice}\end{smallmatrix}\right] \_\_\_\_$

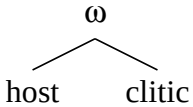
Domain: ω

Enclitic integration now yields the [zuktər] variant, whereas proclitic adjunction results in the [zugdər] variant.

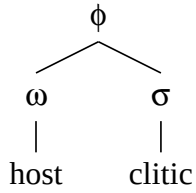
Lahiri *et al.* (1990) point out that there is a problem with such an analysis, namely that the same two variants are found when the clitic is utterance final, and there is no following host available for procliticization.

(22) Ik kies d'r. /kiz+dər/ ⟶ [kistər] or [kizdər]
I choose her$_{\text{Clitic}}$
'I choose her'

As an alternative, they suggest that the two variants are both the result of encliticization, but at different prosodic levels: incorporation into the preceding prosodic word, or attachment to it.

(23) a. 

Enclitic type 1

b. 

Enclitic type 2

[3] For reasons of space, I have left out proclitics from the discussion, but some C-final clitics in (4) can procliticize into their host. See section 5 for some brief remarks.

[4] The proclitic structure in (20a) does not trigger the rule, because of a Chomskyan definition of 'domain' (Booij 1995: 170).

My proposal adopts Lahiri *et al.*'s (1990) idea to model the variation as a result of different prosodic encliticization structures. However in my theory, following the same line as above, this follows regularly from the constraint ranking. In particular, the variable ranking between an exhaustivity constraint EXH_ϕ and a voice identity constraint gives the two prosodic structures and corresponding attested variants.

In (24), I give a derivation of example (22). The double dashed lines in (24) indicate variably ranked constraints. The '(☞)' symbol indicates the winner under the ranking opposite from what is printed.

(24)

	POSTLEXICAL					
		/kis/+/dər/	S-IDENT	EXH_ϕ	$\text{ID}([\text{voi}])_\omega$	ID([voi])-OS
a.	☞	|(kiz|.dər)			*	
b.		|(kis|.dər)	*!			
c.		|(kiz|.tər)	*!		**	*
d.		|(kis|.tər)			*	*!
e.		|(kiz)|.dər		*!	*	
f.		|(kis)|.dər	*!	*		
g.		|(kiz)|.tər	*!	*	*	*
h.	(☞)	|(kis)|.tər		*(!)		*

This tableau needs some explanation. Although Grijzenhout and Krämer (2000) do not account for this variation, they do account for voice assimilation in general. I adopt their S-IDENT constraint (p. 71), a typical agreement constraint.

(25) S-IDENT: Adjacent obstruents agree in voicing.

I also use two specific positional voice identity constraints, in analogy to similar constraints of Grijzenhout and Krämer (2000):[5]

(26) $\text{ID}([\text{voice}])_\omega$: Consonants in a phonological word are faithful with respect to [voice].

(27) ID([voice])-OS: Stops in onset position are faithful with respect to [voice].

First, at the Lexical level the stem undergoes final devoicing, and the input of the Postlexical level is /kis+dər/. The two variant forms [kiz.dər] and [kis.tər] are derived by allowing two alternative prosodic structures to win. The candidates in (24) are divided into incorporation structures (24a–d) and adjunction structures (24e–h). Only the latter violate EXH_ϕ. Consequently, when the ranking is $\text{EXH}_\omega \gg$

[5] Grijzenhout and Krämer (2000:71-2) have slightly different constraints, such as IDENT-PWO (onsets of prosodic words should be faithful w.r.t. [voice]) and IDENT-STOP (stops should be faithful w.r.t. [voice]). Due to differences between the prosodic structures for clitics I assume here, and those of Grijzenhout and Krämer, I have made some small adaptations.

ID([voice])$_\omega$, the clitic incorporates into the prosodic word yielding regressive assimilation. The adjunction structure arises under the inverse ranking (ID([voice])$_\omega$ $\gg$ EXH$_\omega$). In that case ID([voice])$_\omega$ does not apply to the clitic-initial [d], since it now is outside of the prosodic word. This gives (24h) as winner.

4.2. Progressive assimilation

In the case of progressive assimilation we do not find variation. The examples in (6) do not allow a voiced cluster. The challenge is to ensure that the two constraint rankings posited in the previous section do not yield unattested variants in the case of progressive assimilation.

Grijzenhout and Krämer (2000) do not account for the variation with regressive assimilation, but they do have an analysis for progressive assimilation. They employ S-IDENT (see (25)), and IDENT-PWOS (cf. footnote 5):

(28) IDENT-PWOS: Stops in onset position of prosodic words are faithful with respect to [voice]). (Grijzenhout and Krämer 2000: 72)

Their derivation of (6b) looks as follows:

(29) *Grijzenhout and Krämer's (2000) tableau for (6b)*

	/ɣeːv+zə$_{\text{Clitic}}$/	S-IDENT	IDENT-PWOS	*[+voice])$_\omega$
a.	|(ɣeːv)|.zə			*!
b.	|(ɣeːf)|.zə	*!		
c.	|(ɣeːv)|.sə	*!		*
d. ☞	|(ɣeːf)|.sə			

In my proposal, besides the constraints introduced in (25–27), I need to add another constraint in order to account for progressive assimilation. Because the prosodic structures my analysis predicts are different from those in Grijzenhout and Krämer, their positional identity constraints (such as IDENT-PWOS) do not give the right result. I add a constraint to implement progressive assimilation:

(30) *CVF: Do not have a voiced fricative directly after an obstruent.

The Postlexical ranking is as follows, with $\sim$ indicating variable ranking:

(31) S-IDENT $\gg$ *CVF $\gg$ EXH$_\phi$ $\sim$ ID([voice])$_\omega$ $\gg$ ID([voice])-OS

Tableau (32) shows the Postlexical derivation of (6b), repeated below.

(6b) /ɣeːv+zə$_{\text{Clitic}}$/ $\longrightarrow$ [ɣeːf.sə], *[geːv.zə] 'give them'

(32)

	POSTLEXICAL					
		/ɣeːf/+/zə/	S-IDENT	*CVF	EXH$_\phi$	ID([voice])$_\omega$
a.	☞	|(ɣeːf|.sə)				*
b.		|(ɣeːf|.zə)	*!	*		
c.		|(ɣeːv|.sə)	*!			**
d.		|(ɣeːv|.zə)		*!		*
e.	(☞)	|(ɣeːf)|.sə			*(!)	
f.		|(ɣeːf)|.zə	*!	*	*	
g.		|(ɣeːv)|.sə	*!		*	*
h.		|(ɣeːv)|.zə		*!	*	*

Irrespective of the relative ordering of EXH$_\phi$ and ID([voice])$_\omega$, the same surface candidate with a voiceless cluster (32a/e) wins.

5. Conclusion

I proposed an analysis for a set of Dutch data on the interplay between cliticization and voicing that combines insights from Booij's (1995, 1996, 1997) and Grijzenhout and Krämer's (2000) earlier work. The basic tenets of my analysis are a distinction between a Lexical and Postlexical level, and the interaction of segmental and constraints governing wellformedness of prosodic structure. By having final devoicing apply at the Lexical level and clitics attach at Postlexical level, this approach takes care of the problematic data that showed opaque interaction between final devoicing and resyllabification. Following Lahiri *et al.* (1990), my analysis derives the two variants we find for regressive assimilation with [d]-initial clitics by generating two different prosodic structures. These structures are derived regularly by the variable ranking of a structural constraint EXH$_\phi$ and a positional voice identity constraint ID([voice])$_\omega$.

I have argued that my proposal compares favorably to the two previous accounts by Booij and Grijzenhout and Krämer. It is theoretically superior to Booij's analysis because prosodic structures are derived in a regular manner from violable OT constraints. Furthermore, it has a greater empirical coverage than Grijzenhout and Krämer's analysis: my proposal accounts regularly for stems with complex codas, and accounts for variation with [d]-initial clitics as well.

This analysis shows the merits of two-level Optimality Theory: it reflects the insights from Booij that clitics are in the midfield between morphology and syntax, corresponding with separate sets of morphological and phonological rules. My analysis also shows how segmental and prosodic constraints can work together to form a theoretically simple account of empirical data, giving a new approach to arguments that try to restrict such interactions (Blumenfeld 2006).

There are several points on which the theory put forward in this paper can be extended. Although most of the constraints I have discussed are standard varieties of identity and agreement constraints as well as constraints from the Strict Layer

Hypothesis, the implementation of progressive assimilation (section 4.2) using the constraint *CVF (see (30)) could arguably be reformulated in a more elegant way. However, I believe that the general idea of a constraint outranking the variably ranked ones and thereby overriding their effect is the right approach to block unattested variants from winning.

For reasons of space, I have not been able to consider certain data in my analysis. For instance the case of proclitics is discussed in Grijzenhout and Krämer (2000). For cases of simple progressive assimilation, such as /ət+zin/ 'the seeing', my theory correctly predicts [ətsin], so there is no loss of empirical coverage with respect to Grijzenhout and Krämer. However, regressive assimilation is still a problem: [ətbɑkən] 'the baking' violates S-IDENT. This problem is not particular to Grijzenhout and Krämer's approach, and is related to the unusual licensing of a disagreeing cluster. Booij, discussing clitics that consist of a single consonant only, takes the existence of such clusters as evidence that proclitics cannot be integrated into the following prosodic word (1995:177), but rather form an "obstruent appendix" to their host (1996:233). An appendix is considered to be a 'loose segment' directly adjoined to the prosodic word (Booij 1995:26ff.), and hence involves a 'double' violation of EXHAUSTIVITY. Additional constraints will have to deal with the licensing of such prosodic structures and the concomitant consonant clusters.

A second empirical point that I have not discussed is the process of intervocalic voicing (see fn. 1), a less well understood process that has been argued to be subject to individual variation and performance factors. There are indications that this process only applies to more frequent hosts (although this could not be clearly confirmed in Ernestus's (2000) corpus study), and Booij (1996) suggests that host+affix complexes that show intervocalic voicing have become lexicalized to a certain extent, and are therefore input to the Lexical level. Such an idea could be carried over to my analysis, with a different constraint ranking at the Lexical level yielding the right result.

In a wider perspective, it would be interesting to give the theoretical account of variation I have given more empirical underpinning by modeling it in stochastic variants of OT (see section 4.1); however, to my knowledge no large experimental or corpus studies have currently been undertaken that consider this type of variation in Dutch. Finally, the interaction of prosodic and segmental constraints has proven fruitful in light of the Dutch data presented here, but its theoretical appeal will become even clearer when it is applied to data in other languages and can be shown to derive empirical results there.

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