# Scales, |A|, and Limburg Tonogenesis

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## Central thesis

In this talk we aim to contribute to the understanding of the understanding of sonority. We support a multidimensional view within an Element-based framework. In particular, we argue for the role of the element |A| in determining sonority. We show that assuming that this element can be found also on the sonorants /ŋ/ and /r/ gives a more elegant account of sonority.

## 1 The theory of sonority

(1) A taxonomy of sonority theories can be built on two parameters:

- Sonority is rooted in the phonetics vs. sonority is derived from the cognitive organisation ([±phonetics])
- Sonority is a uniform scale vs. sonority consists of a number of (possibly conflicting) factors ([±uniform])

(2)

| | +uniform | -uniform |
|---|---|---|
| + phonetic | 1 phonetic factor (e.g. 'loudness') | several phonetic factors (e.g. enhancing perceptability) |
| - phonetic | 1 representational factor (e.g. complexity) | **the present proposal** |

(3) Traditionally, sonority is represented in terms of a scale:

- low vowels > mid vowels > high vowels > liquids > nasals > obstruents

(4) **Definition 1 (Contiguity of Reference)** *Phonological generalisations refer to a contiguous substring of the sonority scale.*

(5) We argue that Contiguity of Reference is undesirable, hence that sonority is not a uniform phenomenon. In particular, we follow Scheer (2004), who claims that sonority is a function of *three* parameters:

1. the constituent dominating the segment (O or N)
2. the presence vs. absence of manner elements |?| and |h|
3. the role of |A| in the expression (head, operator or absent)

(6) It has been argued by other authors as well that |A| makes a segment more sonorous (e.g. Ritter (1997), Hermans (2003), van der Torre (2003))

(7) The assumption that presence vs. absence of |A| can play a role in defining sonority, is almost trivial for vowels:

[i] = |I| [u] = |U| The higher

[e] = |I| • |A| [o] = |U| • |A|

[a] = |A|

the proportion of |A|, the more sonorous

(8) **Example 1: stress attraction** In Gujarati, if a word contains an [a], this is stressed (else some other vowel is stressed, with extra avoidance of schwa) (de Lacy, 2002). This can be seen as a preference for stress on |A|

| | |
|---|---|
| [utáru] | 'passenger' |
| [sáme] | 'in front' |
| [tádʒetər] | 'recently' |
| [sinemá] | 'movie theatre' |
| [pəhélu] | 'first' |
| [júrop] | 'Europe' |
| [k$^h$əmíso] | 'shirts' |

(9) **Example 2: reduction** In Bulgarian, we find the following reductions of vowels in unstressed position:

- i, e → i
- a → ə
- o, u → u

This can be understood as loss of the |A| in non-prominent positions. There thus is a one-to-one relation between |A| and prosodic prominence

| | | | |
|---|---|---|---|
| *róguf* | 'of horn' | *rugát* | 'horned' |
| *sélu* | 'village' | *silá* | 'villages' |
| *rábutə* | 'work' | *rəbótnik* | 'worker' |

(10) There are various interpretations of the role of the element |A| in consonants. Here we diverge from Scheer (2004), and follow Smith (2000), Swets & van Oostendorp (2003) and van der Torre (2003) instead. The basic claim is that |A| is part of /r/ and /ŋ/ (in Dutch dialects), but not of other sonorant consonants

(11) **Nuclear positions favour /ŋ/**

| Standard Dutch | Wieringen Dutch | |
|---|---|---|
| [hɔnt] | [hɔŋt] | 'dog' |
| [dɑnsə] | [dɑŋsə] | 'to dance' |
| [tɑnt] | [tɑŋt] | 'tooth' |

(12) **/ŋ/ shuns non-prominent positions**
[ŋ] avoids onset positions in many languages of the world. This can be seen as an instance of |A| avoiding dependent/consonantal (Onset) positions

(13) **Nuclear positions favour /r/**

| Standard Dutch | The Hague Dutch | |
|---|---|---|
| [ɔnder] | [ɔndɑ] | 'under' |
| [dɪxtər] | [dɪxtɑ] | 'poet' |

(14) **/r/ shuns non-prominent positions**

| Latin | Sestu Campadinian | |
|---|---|---|
| [rosa] | [arːoza] | 'rose' |
| [rana] | [arːana] | 'frog' |
| [luce] | [luʒi] | 'light' |

(15) **Further motivation for |A| on /r, ŋ/**
If /r, ŋ/ indeed contain the element |A| we expect there to be interaction between these segments, and low vowels, e.g. in the form of a lowering effect of these consonants on preceding vowels

(16) **Lowering effects of /ŋ/**

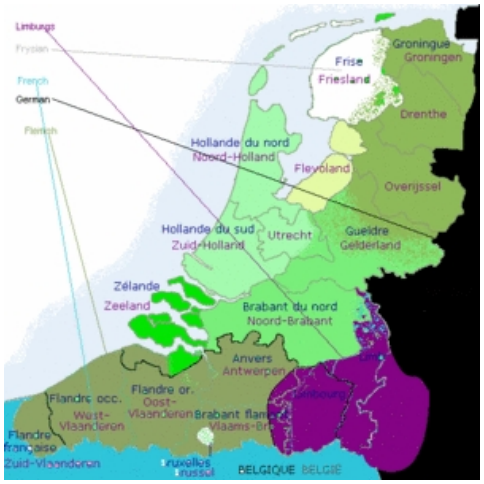
(17) An instance of a lowering effect of /ŋ/ can be found in Alabama English (Veatch, 1991): in words like *spring, finger, thing,* etc. the vowel is realized as [æ]. According to Veatch, Alabama Lowering is "an unnatural, anticoarticulatory effect".

(18) Similarly, Zhang (2006) introduces the following constraint in his analysis of Shiaoxing:
- *[ŋ][+high]: [ŋ] cannot occur before any [+high] (semi-)vowel

(19) **Lowering effects of /r/** It is well-known that in Canadian English, the distinction between e.g. *merry* and *marry* is lost, due to lowering of the former. Non-rhotic varieties of English similarly provide evidence for the presence of |A| on /r/: they have intrusive r when the preceding vowel is not high:
- j'étais déjà[r] ici

- UEAFA[r] officials

## 2 Tonogenesis in Limburg




(20) **Tonal contrasts in modern Limburg**

| | | | |
|---|---|---|---|
| [wáːtər] | ‘water’ | [páːtər] | ‘father (clerical)’ |
| [móːdər] | ‘mother’ | [móːdə] | ‘fashion’ |
| [míːn] | ’my, neuter’ | [mîːn] | ’coal mine’ |
| [réːt] | ’crevice’ | [rêːt] | ’reed’ |
| [káĺ] | ’nonsense’ | [kál̀] | ’to talk’ |
| [máń] | ‘man’ | [páǹ] | ‘pan’ |

(21) **Tones: representations**


Level high tone (‘Schleifton’) Falling tone (‘Stoßton’)

(22) **Long low and mid vowels: falling tone**

| | | |
|---|---|---|
| WGM *eː < *eː | [brêːf] | ‘letter’ |
| WGM *eː < *eo | [lêːf] | ‘sweet’ |
| WGM *oː | [hóːt] | ‘hat’ |
| WGM *ɛː < *ai | [snía] | ‘snow’ |
| WGM *ɔː < *au | [brúət] | ‘bread’ |
| WGM *aː | [dróːt] | ‘thread’ |

(Data are from the tonally conservative dialect of Maasbracht.)

(23) **Long high vowels and diphthongs: level high tone**

| | | |
|---|---|---|
| WGM *iː | [wíːt] | ‘far’ |
| WGM *uː | [vúːl] | ‘dirty’ |
| WGM *ai | [klɛ́it] | ‘dress’ |
| WGM *au | [bɔ́úm] | ‘tree’ |

(24) **Short vowel + ŋ or r: falling tone**

| | |
|---|---|
| váŋ̀ | ‘to catch’ |
| báŋ̀ | ‘afraid’ |
| bríŋ̀ | ‘to bring’ |
| stóŋ̀ | ‘stood’ |
| bár̀ | ‘severe’ |
| vǽr̀ | ‘far’ |
| hɔ́r̀ | ‘wire gauze’ |

(25) **Short vowel + any other consonant: level high tone**

| | |
|---|---|
| kɔ́p | ‘head’ |
| vóx | ‘fluid’ |
| wít | ‘white’ |
| mán | ‘man’ |
| mɔ́l | ‘mole’ |
| vǽl | ‘skin’ |

(26) **Generalisation**

| | | |
|---|---|---|
| Low and mid vowels | : | high vowels |
| | = | |
| /r, ŋ/ | : | other consonants |

(27) **Expressing the generalisation** This generalisation is easily expressed in our framework:

- A Low tone must be linked to an |A|-bearing element.

(28) This rejects the representation on the left-hand side, but accepts the one on the right-hand side.

| wrong | well-formed |
|---|---|
| H L | H L |
| \| \| | \| \| |
| $\mu$ $\mu$ | $\mu$ $\mu$ |
| | \| |
| | A |

(29) It is not possible to express the same generalisation in terms of a scale:

- low vowels > mid vowels > high vowels > r > l > ŋ > m, n > obstruents

(30) Either we have to give up Contiguity of Reference (which makes the whole enterprise devoid of content) or we have to change the order of the segments on a language-particular basis:

- low vowels > mid vowels > r > > ŋ > high vowels > l > m, n > obstruents

(31) **Desideratum: A theory of visibility**

- At first sight, this approach makes strange predictions E.g. a language that allows mid and low vowels, /r/, /ŋ/ in the peak, but not high vowels
- We need a theory of visibility: prosodic heads can only see those place elements that are segmental heads
- Subsyllabic constituents and segments are able to see further details.
- A theory of visibility is needed in any case

(32) Long high vowels and diphthongs do get a falling tone if the next syllable has undergone Schwa Apocope (cf. (22))

| | | |
|---|---|---|
| lîːn | 'line' | < *liːnə |
| prúːm | 'plum' | < *pruːmə |
| klɛ́ìn | 'small' | < *klɛinə |
| vrɔ́ùw | 'woman' | < *vrɔuwə |

(33) The same is true for short vowels followed by a sonorant consonant. (cf. (25)).

| | | |
|---|---|---|
| hɑ́l̀ | 'hall' | < *hɑlə |
| hɛ́l̀ | 'hell' | < *hɛlə |
| kíǹ | 'chin' | < *kɪnə |
| spíǹ | 'spider' | < *spɪnə |
| stɣ́m̀ | 'voice' | < *stɛmə |
| sɔ́m̀ | 'sum' | < *sɔmə |
| trɔ́m̀ | 'drum' | < *trɔmə |
| vlɑ́m̀ | 'flame' | < *vlɑmə |

(34) Given the relevance of Schwa Apocope an alternative solution seems possible (Boersma p.c.): the sonorants /r/ and /ŋ/ attract a falling tone because they were always followed by a schwa.

(35) The Alternative solution does not work for /r/

a. Forms attested in Middle Dutch and Middle High German

| | |
|---|---|
| bɑ́ɾ̀ | 'severe' |
| dɑ́ɾ̀ | 'male bee' |
| tǽɾ̀ | 'tar' |

b. Forms that were non-existent in Middle Dutch and Middle High German

| | |
|---|---|
| bɔ́ɪ̀ (de wolf) | (proper name) |
| hɔ́ɪ̀ | 'wire gauze' |

(36) Alternative solution seems to work for /ŋ/ since in the Limburg dialects the relevant words were the result of schwa apocope:

| | | |
|---|---|---|
| slɑ́ɪŋ | 'snake' | < *slɑŋə |
| tɑ́ɪŋ | '(pair of) tongs' | < *tɑŋə |
| tóɪŋ | 'tongue' | < *toŋə |
| jóɪŋ | 'boy' | < *joŋə |

(37) We still maintain that /ŋ/ attracts low tone since in neighbouring German dialects are also velar nasals which are not the result of schwa drop in -/ngə/. These are the result of velarisation (as in Wieringen, cf. (11))

(38) Velarisation of a nasal is always accompanied by a falling tone (Welter, 1933). Some examples from the region to the west of Aachen

| | | |
|---|---|---|
| fíɪŋ | 'fine' | < *fiːn |
| wíɪŋ | 'wine' | < *wiːn |
| brɣ́ɪŋ | 'brown' | < *bruːn |
| bɛ́ɪŋ | 'leg' | < *bɛin |
| ɛ́ɪŋ | 'one' | < *ɛin |
| klɛ́ɪŋ | 'small' | < *klɛin |

# 3 Conclusions

- We have provided evidence for a multidimensional theory of sonority, and implemented this in a representational framework
- In particular, we argue that the sonorants [r, ŋ] both carry the element |A|
- This makes them more sonorous
- Certain questions remain, e.g. what explains the asymmetry between |A| on the one hand, and |I|, |U| on the other.

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