Scales, |A|, and Limburg Tonogenesis

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Sonority

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- on phonotactics
- on tone-bearing units
- …

but the formalisation of the concept is still a matter of debate

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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])

A taxonomy of theoretical views

	+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**

In this talk, we assume a [-phonetic] approach, and argue for a [-uniform] account.

The [±uniform] dimension

- Traditionally, sonority is represented in terms of a scale:
  - low vowels $>$ mid vowels $>$ high vowels $>$ liquids $>$ nasals $>$ obstruents
- One implication of scales such as this is what we call *Contiguity of Reference*:
  - Phonological generalisations refer to a contiguous substring of the sonority scale.
- We argue that Contiguity of Reference is undesirable, hence that sonority is not a uniform phenomenon

Representational approaches

- A representational [+uniform] approach is Harris (1990): the more elements a segment has, the more sonorous it is
- This implies Contiguity of Reference

A, I, U theory

- We represent a [-uniform] approach based on Element Theory
- 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)
- It has been argued by other authors as well that this element makes a segment more sonorous (e.g. Ritter 1997, Hermans 2003, Van der Torre 2004)

Asymmetries within the set of elements

- We concentrate on presence vs. absence of |A|
- We thus establish a subscale $|A| > \emptyset$
- That presence vs. absence of |A| can play a role in defining sonority, is almost trivial for vowels:

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

  [e] = |I| • |A| [o] = |U| • |A|

  [a] = |A|
- The more |A|, the more sonorous

Example: 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’

Example: 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'

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Consonants and |A|

- 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 (2004) instead.
- The basic claim is that |A| is part of /r/ and /ŋ/ (in Dutch dialects), but not of other sonorant consonants

Nuclear positions favour /ŋ/

Standard Dutch	Wieringen Dutch	
[hɔnt]	[hɔŋt]	‘dog’
[dɑnsə]	[dɑŋsə]	‘to dance’
[tɑnt]	[tɑŋt]	‘tooth’

- Many continental West-Germanic dialects display a process of velarisation
- This can be seen as an instance of attraction of |A| to prominent (Nuclear) positions

/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

Nuclear positions favour /r/

Standard Dutch	The Hague Dutch	
[ɔndər]	[ɔndɑ]	‘under’
[dɪxtər]	[dɪxtɑ]	‘poet’

- A similar process can be found in Standard German
- This can be seen as an instance of attraction of |A| to prominent positions: |A| moves to the nuclear peak

/r/ shuns non-prominent positions

Latin	Sestu Campadinian	
[rosa]	[arːoza]	‘rose’
[rana]	[arːana]	‘frog’
[luce]	[luʒi]	‘light’

- A similar effect can be found in Mbabaram
- This can be seen as an instance of |A| avoiding dependent/consonantal (Onset) positions

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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

Lowering effects of /ŋ/

- 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”.
- Similarly, Zhang (2006) introduces the following constraint in his analysis of Shiaoxing:
  - *[ŋ][+high]: [ŋ] cannot occur before any [+high] (semi-)vowel
- Both Alabama and Shiaoxing can be analysed as |A| spreading

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
- These phenomena find a parallel in the fact that after high vowels hiatus is resolved by the insertion of a homorganic glide:
  - the key[j] is
  - the zoo[w] is

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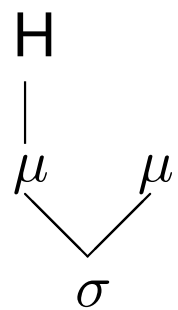
Limburg speaking area in the Netherlands and Belgium

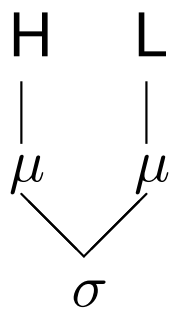
Tonal contrasts in modern Limburg

[wáːtər]	‘water’	[páːtər]	‘father (clerical)’
[móːdər]	‘mother’	[móːdə]	‘fashion’
[míːn]	’my, neuter’	[mîːn]	’coal mine’
[réːt]	’crevice’	[réːt]	’reed’
[kɑ́ːl]	’nonsense’	[kɑ́ːl]	’to talk’
[mɑ́ːn]	‘man’	[pɑ́ːn]	‘pan’

Tones: representations



Level high tone (‘Schleifton’)



Falling tone (‘Stoßton’)

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Long low and mid vowels: falling tone

WGM *eː < *eː	[bréi̯ːf]	‘letter’
WGM *eː < *eo	[léi̯ːf]	‘sweet’
WGM *oː	[hóu̯ːt]	‘hat’
WGM *ɛː < *ai	[sníə]	‘snow’
WGM *ɔː < *au	[brúət]	‘bread’
WGM *aː	[drɔ́u̯ːt]	‘thread’

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

Long high vowels and diphthongs: level high tone

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

Short vowel + ŋ or r: falling tone

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

Short vowel + any other consonant: level high tone

kɔ́p	‘head’
vóx	‘fluid’
wít	‘white’
mɑ́ɲ	‘man’
mɔ́l̃	‘mole’
vǽl̃	‘skin’

Generalisation

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

Expressing the generalisation

- This generalisation is easily expressed in our framework:
  - A Low tone must be linked to an |A|-bearing element.
- This rejects the representation on the left-hand side, but accepts the one on the right-hand side.

wrong	well-formed
H L | | μ μ	H L | | μ μ | A

Expressing the generalisation (2)

- 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
- 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

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

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A small, but relevant detour: Schwa Apocope

- Long high vowels and diphthongs do get a falling tone if the next syllable has undergone Schwa Apocope.

lîːn	‘line’	< *liːnə
prúːm	‘plum’	< *pruːmə
klɛ́ːn	‘small’	< *klɛinə
vrɔ́ùw	‘woman’	< *vrɔuwə

Short vowel plus sonorant consonant

- The same is true for short vowels followed by a sonorant consonant.

hɑ́l̀	‘hall’	< *hɑlə
hɛ́l̀	‘hell’	< *hɛlə
kíǹ	‘chin’	< *kɪnə
spíǹ	‘spider’	< *spɪnə
stʏ́m̀	‘voice’	< *stɛmə
sɔ́m̀	‘sum’	< *sɔmə
trɔ́m̀	‘drum’	< *trɔmə
vlɑ́m̀	‘flame’	< *vlɑmə

An alternative solution to our account

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.
  - Not true for /r/.
  - True for /ŋ/; all instances of velar nasal have -/ngə/ as their source.

Alternative solution does not work for /r/

- Forms attested in Middle Dutch and Middle High German
  - bɑ́ɾ̀ ‘severe’
  - dɑ́ɾ̀ ‘male bee’
  - tǽɾ̀ ‘tar’
- Forms that were non-existent in Middle Dutch and Middle High German
  - bɔ́ɾ̀ (de wolf) (proper name)
  - hɔ́ɾ̀ ‘wire gauze’

Alternative solution seems to work for /ŋ/

- Forms which were the result of schwa apocope:

slá̀ŋ	‘snake’	< *slɑŋə
tá̀ŋ	‘(pair of) tongs’	< *tɑŋə
tó̀ŋ	‘tongue’	< *toŋə
jó̀ŋ	‘boy’	< *joŋə

Why we still maintain that /ŋ/ attracts low tone

- There are also velar nasals which are not the result of schwa drop in -/ngə/
- These are the result of velarisation (as in Wieringen)

Why we still maintain that /ŋ/ attracts low tone

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

fíə̀ŋ	'fine'	< *fiːn
wíə̀ŋ	'wine'	< *wiːn
brʏ́ə̀ŋ	'brown'	< *bruːn
bɛ́ə̀ŋ	'leg'	< *bɛin
ɛ́ə̀ŋ	'one'	< *ɛin
klɛ́ə̀ŋ	'small'	< *klɛin

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.