Laryngeal Relativism. Why? And what now?

Eugeniusz Cyran
KUL, Lublin
Introduction:

- Philosophy that has led to Laryngeal Relativism
- Consequences that follow from Laryngeal Relativism
- Polish data (mainly) used for illustration
  - Representation of contrast, e.g. b/p
  - Distribution of laryngeal contrast
    - Processes connected with voicing:
      - Final Obstruent Devoicing (FOD)
      - Regressive Voice Assimilation (RVA)
  - Role of sonorants as the target, source and barrier
- Relationship between phonology and phonetics
Two-way voicing contrast in Polish

|   |  
|---|---|
|   | #_V | V_V |
|   | pić ['pʲit͡ɕ] ‘to drink’ | rysa [risa] ‘scratch’ |
|   | bić ['bʲit͡ɕ] ‘to hit’ | ryza [riza] ‘ream’ |
|   | #_SV | V_SV |

__(S)V
Neutralization and Final Obstruent Devoicing

- a. [vaga]/[vak]  waga / wag  ‘scale, nom.sg./gen.pl.’
  [zaba]/[zap]  żaba/ żab  ‘frog, nom.sg./gen.pl’

- b. [muzgu]/[musk]  mózgu/ mózg  ‘brain, gen.sg./nom.sg.’

- c. [dobrɔ]/[dɔpr]  dobro /dóbr  ‘goodness, nom.sg./gen.pl.’

_ (S) #
Neutralization and Regressive Assimilation

• a. [dɛx]/[txu] dech/tchu ‘breath, nom.sg./gen.sg.’
• b. [proɕitɕ]/ [proʑba]prosić / prośba ‘to ask/a request’
• c. [kfβad bɛgota] kwiat begonii ‘begonia flower’
• d. [mɛndrɛk]/[mɛntrka] müdrek/mędrka ‘smart-aleck,/gs.’
Distribution of laryngeal contrast in Polish

a. 
... C (S) V...
  \[\text{Lar}\]

b. 
... C (S) #
  \[\not\equiv \text{Lar}\]

c. 
... C (S) C...
  \[\not\equiv \text{Lar}\]

C = obstruent
(S) = optional sonorant
Lar = laryngeal contrast
V = vowel
Two extreme positions on representation of voicing

- Binarity, e.g. $[\pm \text{voice}]$

vs.

- Strict privativity
Binary representation of voice [+voi] / [−voi]

Simplified story:

- everything that is phonetically voiced has [+voi]
- everything that is phonetically voiceless has [−voi]

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<tr>
<td>[+voi]</td>
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<td>[+voi]</td>
<td>[−voi]</td>
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Neutralization and Regressive Assimilation in \([±voi]\) systems

a. \textit{liczba} /li\ i tʃ - b a/ \(>\) [lijdʒba] ‘number’

\[\begin{array}{c}
\vdash-\text{voi} \\
\vdash+\text{voi}
\end{array}\]

b. \textit{żabka} /ʒa b - k a/ \(>\) [ʒapka] ‘frog, dim.’

\[\begin{array}{c}
\vdash+\text{voi} \\
\vdash-\text{voi}
\end{array}\]
Neutralization and Final Devoicing (FOD)

a. stóg /stu g/ > [stuk] ‘haystack’

b. stk /stu k/ > [stuk] ‘knock’
Problems with binary representation

- It is able to describe everything
- It blows up computation
  - both without providing much insight (understanding)
- Feature [+voi] behaves differently in sonorants and obstruents, e.g., asymmetry in:
  - assimilations
  - devoicing
- Being symmetrical, [+voice] ignores universally observed asymmetries between [+voi] and [-voi] (markedness).
  - implications
  - distribution (direction of neutralization)
  - frequency of occurrence
  - etc.
Examples of influence of representation on computation

- **Rule specificity**, e.g.:  
  - [+voi] can spread only from obstruents, and only onto obstruents (assimilations)

- **Rule ordering**, e.g.:  
  - [+voi] is provided and spreads at the „right moment”

- **Underspecification of sonorants**  
  - [+voi] is added later in derivation especially that it comes in handy sometimes...
Towards Laryngeal Realism...
Privatility

- A representational means to express markedness tendencies and asymmetries, e.g. inactivity of some values of a particular feature

- Sometimes argued for by reference to „economy” – a two-way contrast requires just one category

- If there is no contrast, no marking is necessary
  - Sonorants have no [voice]
  - Obstruents in, e.g. Polish mark one series

- This led us to Underspecification and later to a „soft” version of Laryngeal Realism
Phonetic categories based on VOT (Voice Onset Time)

closure

release

vowel

[d] [t] [th]

fully voiced voiceless unaspirated voiceless aspirated

VOT lead

VOT lag

vowel

C[voi] C[co] C[sg]
Voicing and Aspiration languages

Voicing

Romance & Slavic

voiced

[d]

/C[voi]/

voiceless unaspirated

[t]

/C⁰/

voiceless aspirated

[tʰ]

/C[sg]/

Hawaiian

Polish

Icelandic

Thai

Hindi

[ۢd] = /d[voi]+[sg]/
Philosophy that led me to Laryngeal Relativism

- **Hard privativity**
  Laryngeal Realism à la Element Theory

- **Non-specification** rather than Underspecification
  - Direct phonetic interpretation of non-specified objects
  - No production bias
  - Derivation within phonology, not towards phonetics
  - What you see is not always what you get

- **No phonological voicing in sonorants**
  - Neither [voi] nor [Sonorant Voice], ever!
3 types of voicing in Laryngeal Realism

- **Spontaneous** (universal phonetics) sonorants $V^o$, $S^o$
  - No marking!!!

- **Active**
  - Marked

- **Passive**
  - No marking (voicing is system dependent)

Within one system, voicing in obstruents is either **active** or **passive**, never both!!!
Neutralization and Regressive Assimilation in Laryngeal Realism

a. *liczba* /lj i tʃ o - ba/ > [lʲidʒba] ‘number’

b. *żabka* /ʒ a b o - k o a/ > [ʒapka] ‘frog, dim.’
Neutralization and Final Devoicing in Laryngeal Realism

a. \( stóg \) /stu\( g^{0} \)/ \(\rightarrow\) [stu]\( k \) ‘haystack’

\[\text{[voi]}\]

b. \( stk \) /stu\( k^{0} \)/ \(\rightarrow\) [stu]\( k \) ‘knock’
Life, however, is more complicated...

Sometimes sonorants trigger voicing
Cracow-Poznań Sandhi Voicing

Warsaw Polish (WP) vs. Cracow-Poznań (CP)

a. *jak oni* wkład odrębny
   - WP: k-o t-o
   - CP: __V[+voi]

b. *jak możesz* wkład mój
   - WP: k-m t-m
   - CP: __S[+voi]

c. *jak dobrze* wkład własny
   - WP: g-d d-v
   - CP: __C[+voi]

d. *jak trudno* wkład stały
   - WP: k-t t-s
   - CP: __C[−voi]
Formal analysis in binary feature models

- Spreading of [+voi] as in Regressive Voice Assimilation
- The target must be first neutralized
- The difference between WP and CP lies in the scope of the spreading rule wrt the source/trigger
  - **WP**: spreading [+voi] from obstruents only
  - **CP**: spreading [+voi] from any segment that has it (including vowels)
Binary feature analysis (Rubach 1996)

**WP**

a. /j a k # o j i/

- [-voi] [-voi] [+voi] 
  - default

b. /j a k # m o z e j/

- [-voi] [-voi] [+voi] 
  - default

c. /j a k # d o b z e/

- [-voi] [+voi] 

**CP**

/ j a k # o j i/

- [-voi] [+voi]

/ j a k # m o z e j/

- [-voi] [+voi]

/ j a k # d o b z e/

- [-voi] [+voi]
How about Laryngeal Realism? Polish is a voicing language ($C^o$ vs. $C^{[voi]}$)

Warsaw Polish is well behaved

**Phonology**

a. /ja\k^o\#o^o\n\i/

**Phonetic interpretation**

> [jak o\ni]

b. /ja\k^o\#m^o\o\z\e\f/

> [jak m\o\z\e\f]

c. /ja\k^o\#d\o\b\z\e/

> [jag do\b\z\e]

Cracow-Poznań cannot be handled with [voi]
Towards Laryngeal Relativism...
Variation in laryngeal systems and a hypothesis...

**phonetic categories**

<table>
<thead>
<tr>
<th>[voi]</th>
<th>[sg]</th>
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Slavic & Romance

Icelandic

English

Dutch???
Laryngeal Relativism

*phonetic categories*

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Voicing of obstruents is **passive** in CP, and **active** in WP
Some immediate offshoots

- Phonetic interpretation is not acting on instruction but on associations established in acquisition
  - No enhancement necessary (production bias)
- Arbitrary relation between phonetic categories and phonological ones (cf. the rest of grammar)
  - Phonology and Phonetics are two different modules
- Laryngeal categories may be substance free and emergent
- Both voicing and aspiration languages might use the same category [blue] rather than two: [voi] and [sg]
Two immediate questions

• How is such a system acquired?
  • Emergent [blue], possibly with some info concerning particular dimensions

• What do the basic processes look like in CP?
  • FOD, RVA, and especially the Cracow-Poznań Sandhi voicing?
Final Devoicing in CP is interpretational not computational

/3°ab°a/ > [3aba]  \sim  /3°ab°/ > [3ap]

Final Devoicing is rather an absence of passive voicing

Textbook question: Are we dealing with FOD or intervocalic voicing in [3aba~3ap]?

Textbook answer: FOD, because if there was a rule of intervocalic voicing, then /mapa/ → *[maba]

Wrong: we do not expect intervocalic delaryngealization

/map[^blue]a/ → /map°a/ > [*maba] in CP

CP has Neutralization, but it takes place in the contexts {_, _C}

/map[^blue]/ → /map°/ > [map]
Neutralization and Regressive Assimilation in Laryngeal Relativism (CP)

a. \textit{liczba} \quad /\text{l}^i\; i \; t^o / - b^o a/ \quad > \quad [\text{l}^i\text{id}3\text{ba}]

b. \textit{żabka} \quad /\text{z} \quad a \; b^o / - k a/ \quad > \quad [\text{z}a\text{p}k\text{a}]

[blue]
What about Cracow-Poznań Sandhi voicing?
Just two more details...

The target of sandhi voicing must be /C^o/
- either lexically neutral
- or neutralized

The source of voicing of obstruents:
WP       CP
C[blue]  C^o + following voiced context
A reminder of what happens in Warsaw...

C⁰ must be voiceless in a [voi/blue]-system

**Phonology**

\[ /j\, a\, k^o\, #\, o^o\, n\, i/ \]

**Phonetic interpretation**

\[ > [j\, a\, k\, o\, n] \]

\[ /j\, a\, k^o\, #\, m^o\, o\, z\, e\, j/ \]

\[ > [j\, a\, k\, m\, o\, z\, e\, j] \]

\[ /j\, a\, k^o\, #\, d\, o\, b\, z\, e/ \]

\[ > [j\, a\, g\, d\, o\, b\, z\, e] \]
In Cracow-Poznań, on the other hand...

**Phonology**

- /j a  kʰ #  o̞n i/  
  - [blue]
- /j a  kʰ #  m o  ż e j/  
  - [blue]
- /j a  kʰ #  d o b  ż e/  
  - [blue]

**Phonetic interpretation**

> [jag ońi]

> [jag mżaʃ]

> [jag dobże]
Because in Cracow-Poznań...

/C⁰/ must be voiced in front of V, S, C[^+voi]

inside words and between words

C⁰V⁰ [dom] = C⁰#V⁰ [brad-ojtsa]
C⁰S⁰ [bratʃ] = C⁰#S⁰ [kub-ribe]
C⁰C⁰ [gdi] = C⁰#C⁰ [jag-dob3e]
The main pillars of this analysis

- “Reversed” marking of obstruents in CP and WP:
  - CP system = $C^o--------C^{[blue]}$
  - WP system = $C^{[blue]}---C^o$
  - Warsaw $C^o$ cannot be passively voiced

- CP voicing requires:
  - A system with marked voicelessness: $C^o----C^{[blue]}$
  - Passive voicing
  - Neutralization $C^{[blue]} \rightarrow C^o / \{\_\#, \_C\}$
Advantages of this analysis

- Sonorants remain unmarked
  - Their voicing is only of phonetic nature and importance

- No special phonological rule is required for CP sandhi voicing
  - No rule ordering either
  - Sandhi voicing = word-internal voicing in CP
Consequences of this analysis and Laryngeal Relativism

- There is no phonological voicing in CP
  - Only spontaneous and passive
- Final Obstruent Devoicing can be:
  - Phonological (in Warsaw system)
  - Interpretational (in Cracow-Poznań system)
- Assimilations can be:
  - Phonological
    - Spreading of [blue]
    - Neutralization (deletion of [blue])
  - Interpretational (WP /tʰxʰu/, CP /jakʰ dʰob3e/)
- Full voicing of obstruents, FOD and RVA are not adequate criteria for claiming that a given language has [+voi]
- A „voicing” system relates merely to the phonetic categories
- The relation between phonological category [blue] and phonetic categories (b-p-pʰ) is by and large arbitrary!
Between phonology and phonetics...

**Sound system** (e.g. Laryngeal system)

**Phonology**  
- Representation & Computation
  - privative categories
  - (un)licensing
  - (de)composition: spreading, delinking

**Phonetics**  
- Phonetic categories & Phonetic interpretation
  - universal phonetic principles
  - universal principles of phonetic interpretation
  - system specific conventions
  - sociolinguistic modifications
## Typology of two-way systems

### Phonetic categories

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New Realism / New Relativism
Typology of two-way systems (van der Hulst 2015)

phonetic categories

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Old and new types of bias concerning laryngeal phonology

OLD:

1) "what you see is what you get",
   - What is phonological behaviour?

2) production-biased perspective
   - Confusing phonological derivation with going from /.../ -> to -> [...]

Both make it impossible to see the difference between phonology and phonetics
Alternative type of bias (blue glasses)

Acquisition perspective with no amnesia

- We start with phonetic categories
  - Phonetic theory
- Principles of acquisition/phonologization, e.g.:
  - Arbitrariness, privativity > emergent, substance-free features
  - Rules
- Small and rather beautiful Phonology
  - Phonological theory restricted by the above
Some references


