Laryngeal Relativism. Why? And what now?

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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

- *pić* [**p**ʲit͡ɕ] 'to drink'
- *bić* [**b**ʲit͡ɕ] 'to hit'

#_SV

- *płotem* [**p**wɔtɛm] 'fence, instr.'
- *błotem* [**b**wɔtɛm] 'mud, instr.'

V_V

rysa [rɨ**s**a] 'scratch'
ryza [rɨ**z**a] 'ream'

V_SV

oknie [ɔ**k**ɲɛ] 'window, loc.'
ognie [ɔ**g**ɲɛ] 'fire, pl.'

__(S)V

Neutralization and Final Obstruent Devoicing

- a. [va**g**a]/[va**k**] *waga* / *wag*   'scale, nom.sg./gen.pl.'
     [ʒa**b**a]/[ʒa**p**] *żaba*/ *żab*   'frog, nom.sg./gen.pl.'

- b. [mu**zg**u]/[mu**sk**] *mózgu*/ *mózg* 'brain, gen.sg./nom.sg.'

- c. [dɔ**b**rɔ]/[du**p**r] *dobro* /*dóbr* 'goodness, nom.sg./gen.pl.'

__ (S)

Neutralization and Regressive Assimilation

- a. [**d**ɛx]/[**tx**u] *dech*/*tchu* 'breath, nom.sg./gen.sg.'

- b. [prɔ**ɕ**it͡ɕ]/ [prɔ**ʑb**a] *prosić* / *prośba* 'to ask/a request'

- c. [kfʲa**d b**ɛgɔɲji] *kwiat begonii* 'begonia flower'

- d. [mɛn**dr**ɛk]/[mɛn**trk**a] *mędrek*/*mędrka* 'smart-aleck,/gs.'

__ (S)C

Distribution of laryngeal contrast in Polish

a.   **b.**   **c.**

... C (S) V...   ... C (S) #   ... C (S) C...
    | ‡   ‡
  Lar   **Lar**   **Lar**

C   = obstruent
(S)   = optional sonorant
Lar = laryngeal contrast
V   = vowel

Two extreme positions on representation of voicing

- Binarity, e.g. [± 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**]

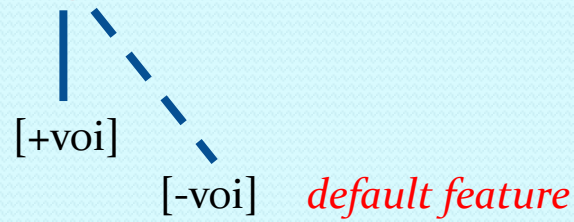| /b/	/m/	/a/	/p/
|	|	|	|
[+voi]	[+voi]	[+voi]	[–voi]

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Neutralization and Regressive Assimilation in [±voi] systems

a. *liczba*   /lʲ i **tʃ** - ba/   >   [lʲi**dʒb**a]
                                                      'number'
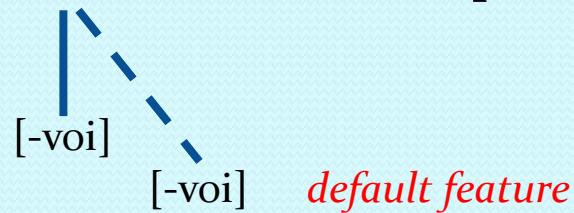
[-voi]

[+voi]

b. *żabka*   /ʒ a **b** - ka/   >   [ʒa**pk**a]
                                                    'frog, dim.'

[+voi]

[-voi]

Neutralization and Final Devoicing (FOD)

a. *stóg*   /stu g/   >   [stuk] 'haystack'

|
[+voi]
[-voi]   *default feature*

b. *stuk*   /stu k/   >   [stuk] 'knock'

|
[-voi]
[-voi]   *default feature*

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.

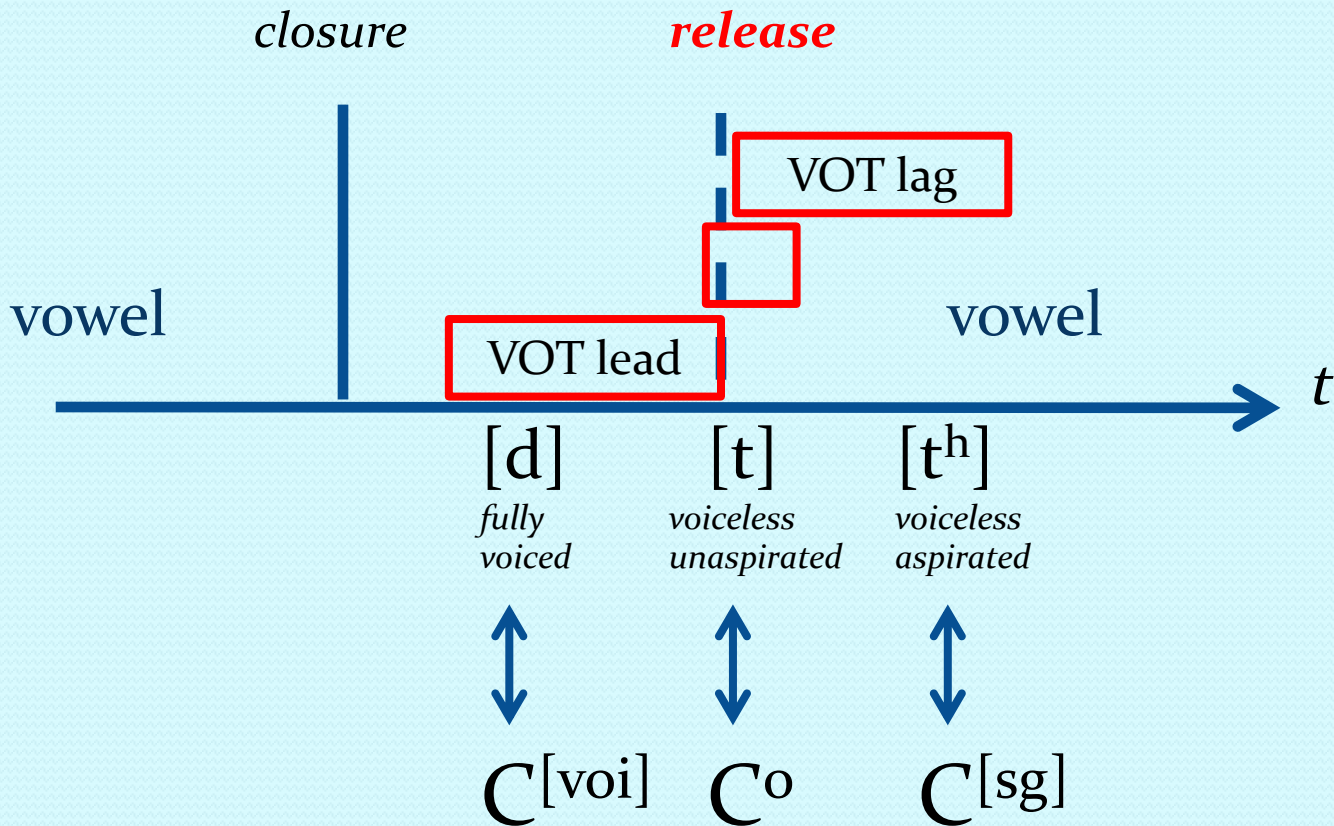# Examples of influence of representation on computation

- **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...

Privativity

- 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

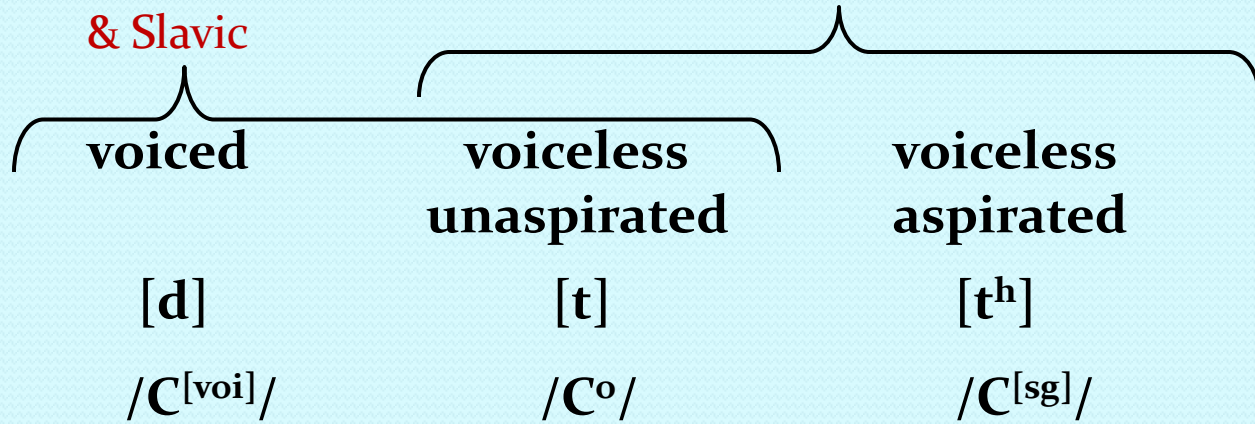# Phonetic categories based on VOT (Voice Onset Time)

Voicing and Aspiration languages

	'voicing'	'aspiration'	
	Romance & Slavic	Germanic	
	voiced	voiceless unaspirated	voiceless aspirated
	[d]	[t]	[tʰ]
	/C[voi]/	/Cᵒ/	/C[sg]/
Hawaiian		/tᵒ/	
Polish	/d[voi]/ ⟷	/tᵒ/	
Icelandic		/tᵒ/ ⟷	/t[sg]/
Thai	/d[voi]/	/tᵒ/	/t[sg]/
Hindi	/d[voi]/	/tᵒ/	/t[sg]/

$$[d^ɦ] = /d^{[voi]+[sg]}/$$
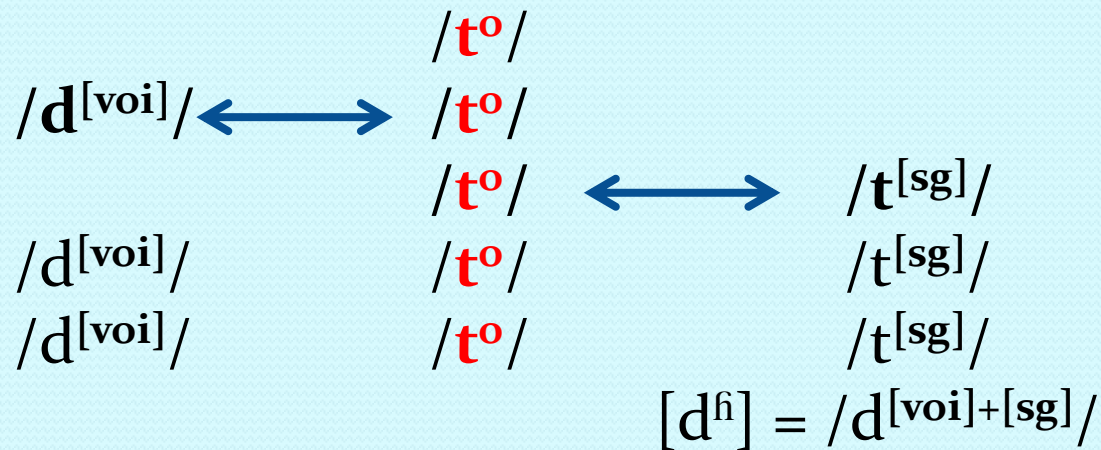
Philosophy that led me to Laryngeal Relativism

- **Hard privativity**

    Laryngeal Realism à la Element Theory

- **Non-specification** rather than Underspecification
    - Direct <u>phonetic interpretation</u> 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**
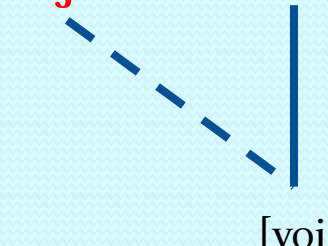
    - Neither [voi] nor [Sonorant Voice], **ever!**

3 types o voicing in Laryngeal Realism

- <u>Spontaneous</u> (universal phonetics)   sonorants V^o, S^o
  - No marking!!!

- <u>Active</u>   obstruents $C^{[voi]}$
  - Marked

- <u>Passive</u>   obstruents C^o
  - No marking (voicing is system dependent)

Within one system, voicing in obstruents is either <u>active</u> or <u>passive</u>, never both!!!

Neutralization and Regressive Assimilation in Laryngeal Realism

a. *liczba*   /lʲ i tʃº - b a/   >   [lʲidʒba]

                                      'number'

[voi]

b. *żabka*   /ʒ a bº - kº a/   >   [ʒapka]

                                        'frog, dim.'

[voi]

Neutralization and Final Devoicing in Laryngeal Realism

a. *stóg* /stu g⁰/   >   [stu**k**] 'haystack'

[voi]

b. *stuk* /stu k⁰/   >   [stu**k**] 'knock'

Life, however, is more complicated…

Sometimes sonorants trigger voicing

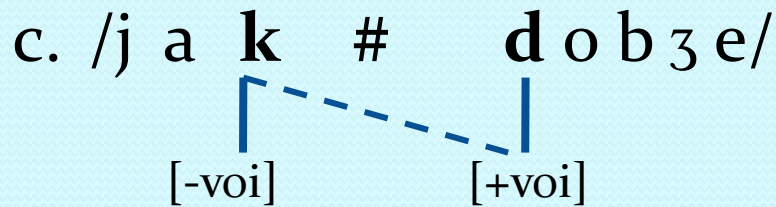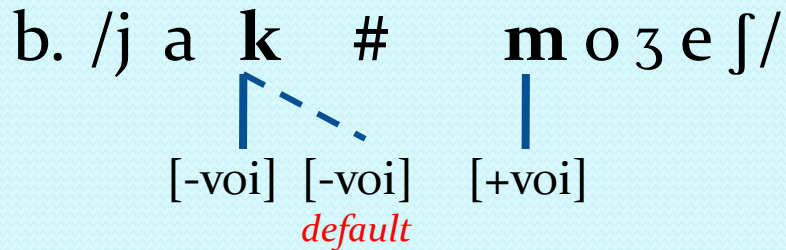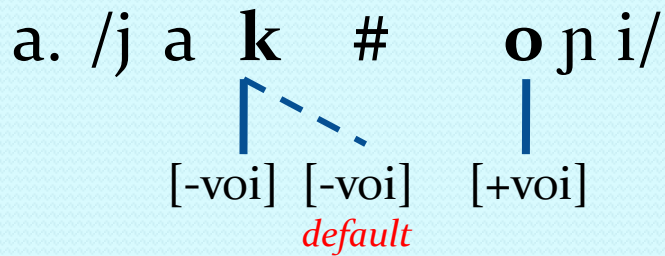# Cracow-Poznań Sandhi Voicing

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

		WP	**CP**
a.	*jak oni*	k-o	
	wkład odrębny	t-o	
b.	*jak możesz*	k-m	
	wkład mój	t-m	
c.	*jak dobrze*	g-d	
	wkład własny	d-v	
d.	*jak trudno*	k-t	
	wkład stały	t-s	

$\underline{\quad}V^{[+voi]}$

$\underline{\quad}S^{[+voi]}$ CP

$\underline{\quad}C^{[+voi]}$

WP

$\underline{\quad}C^{[-voi]}$
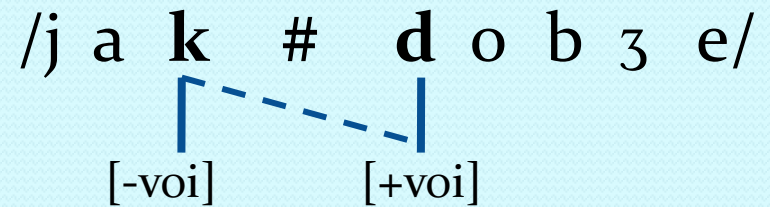
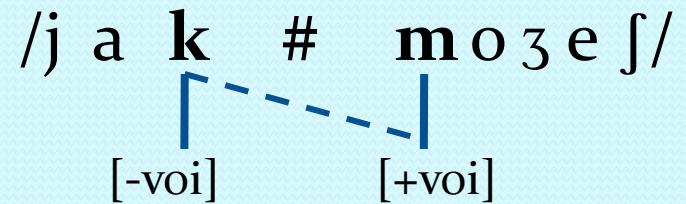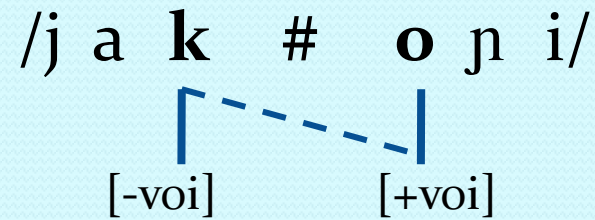# Formal analysis in binary feature models

- 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 **CP**

a. /j a **k** # **o** ɲ i/   /j a **k** # **o** ɲ i/

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

b. /j a **k** # **m** o ʒ e ʃ/   /j a **k** # **m** o ʒ e ʃ/

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

c. /j a **k** # **d** o b ʒ e/   /j a **k** # **d** o b ʒ e/

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

How about Laryngeal Realism?
Polish is a voicing language (C° vs. C[voi])

Warsaw Polish is well behaved

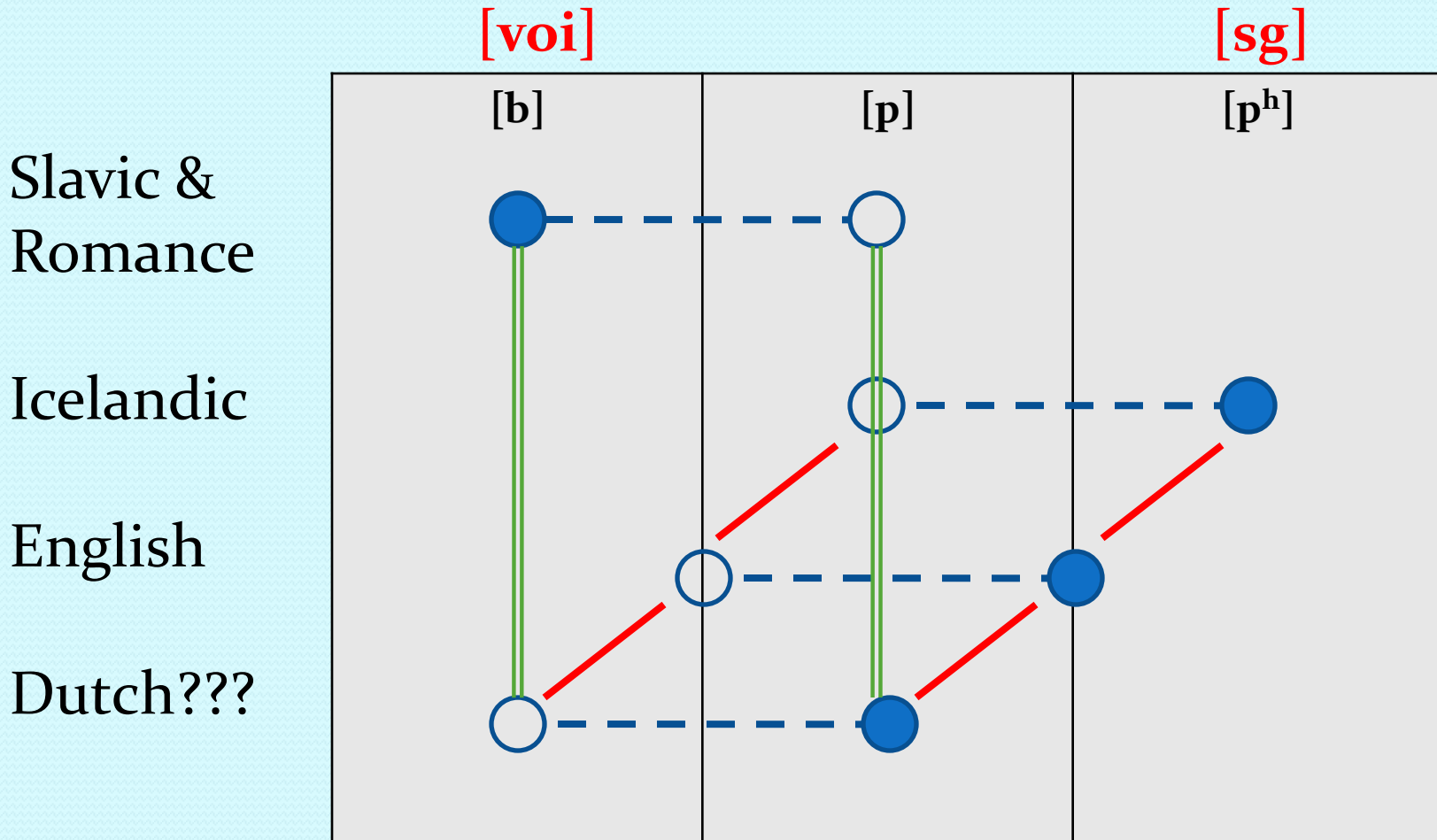| *Phonology*	*Phonetic interpretation*
a. /j a **k°** # **o°** ɲ i/	> [ja**k** oɲi]
b. /j a **k°** # **m°** o ʒ e ʃ/	> [ja**k** moʒeʃ]
c. /j a **k°** # **d** o b ʒ e/	> [ja**g** dobʒe]
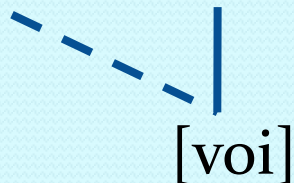
[voi]

Cracow-Poznań cannot be handled with [voi]

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Towards Laryngeal Relativism...

Variation in laryngeal systems and a hypothesis...

phonetic categories

Laryngeal Relativism

phonetic categories

	[b]	[p]	[pʰ]
Warsaw Polish	●	○	
Cracow-Poznań Polish	○	●	
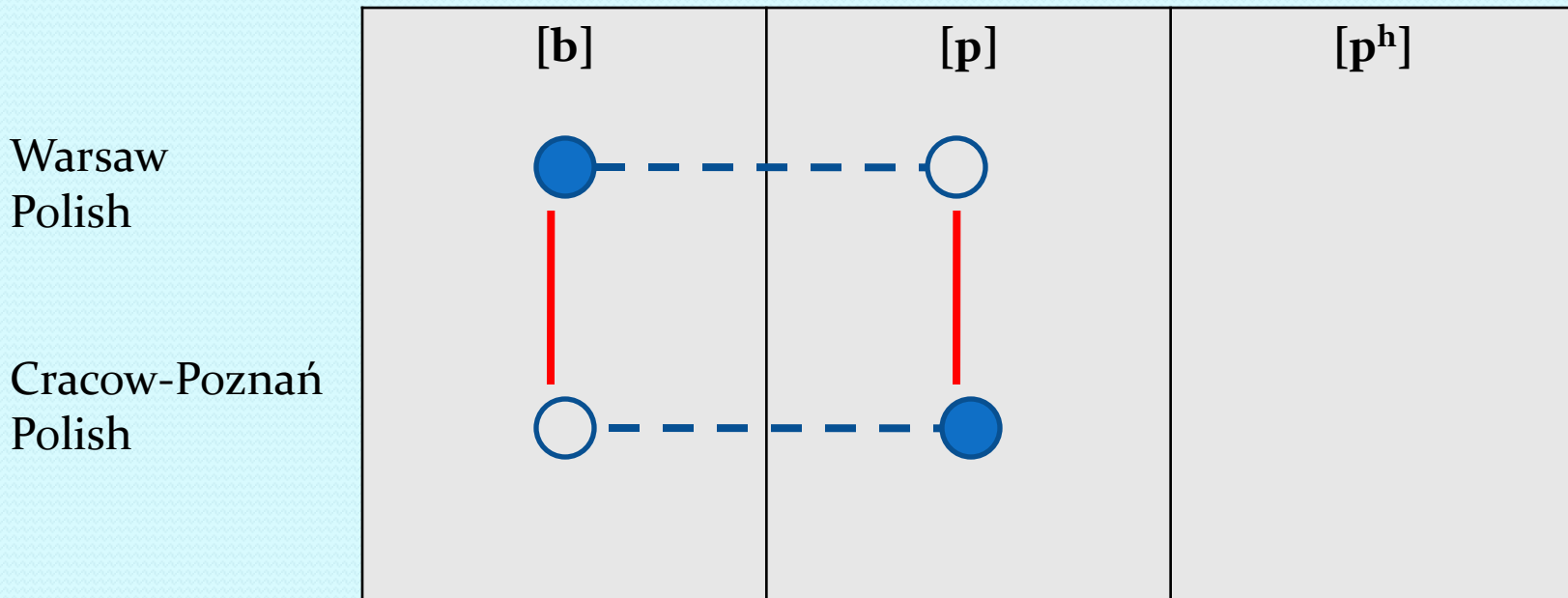
Voicing of obstruents is <u>passive</u> in CP, and <u>active</u> in WP

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

/ʒᵒabᵒa/ > [ʒa**ba**]   ~   /ʒᵒabᵒ/ > [ʒa**p**]

Final Devoicing is rather an absence of passive voicing

Textbook question: Are we dealing with FOD or intervocalic voicing in [ʒaba~ʒap]?

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/ → /mapᵒa/ > [*maba] in CP

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

/map[blue]/   →   /mapᵒ/   >   [ma**p**]

Neutralization and Regressive Assimilation in Laryngeal Relativism (CP)

a. *liczba*   /lʲ i **tʃº** - bºa/   >   [lʲi**dʒb**a]

[blue]

b. *żabka*   /ʒ a bº - ka/   >   [ʒa**pk**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

$C^{[\text{blue}]}$ C^o + following voiced context

A reminder of what happens in Warsaw...

C^o must be voiceless in a [voi/blue]-system

Phonology

/j a **k^o** # **o^o**ɲ i/

/j a **k^o** # **m^o** o ʒ e ʃ/

/j a **k^o** # **d** o b ʒ e/

[blue]

Phonetic interpretation

> [ja**k** oɲi]

> [ja**k** moʒeʃ]

> [ja**g** dobʒe]

In Cracow-Poznań, on the other hand…

Phonology   *Phonetic interpretation*

/j a **kᵒ**   #   **oᵒ**ɲ i/   > [ja**g** oɲi]
       |
     [blue]

/j a **kᵒ**   #   **mᵒ** o ʒ e ʃ/   > [ja**g** moʒeʃ]
       |
     [blue]

/j a **kᵒ**   #   **dᵒ**o b ʒ e/   > [ja**g** dobʒe]
       |
     [blue]

Because in Cracow-Poznań...

/C°/ must be voiced in front of V, S, C$^{[+voi]}$

inside words   *and*   *between words*

C°V°   [dom]   =   C°#V°   [brad-oj͡tsa]
C°S°   [bra͡tɕ]   =   C°#S°   [kub-rɨbe]
C°C°   [gdɨ]   =   C°#C°   [jag-dobʒe]

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
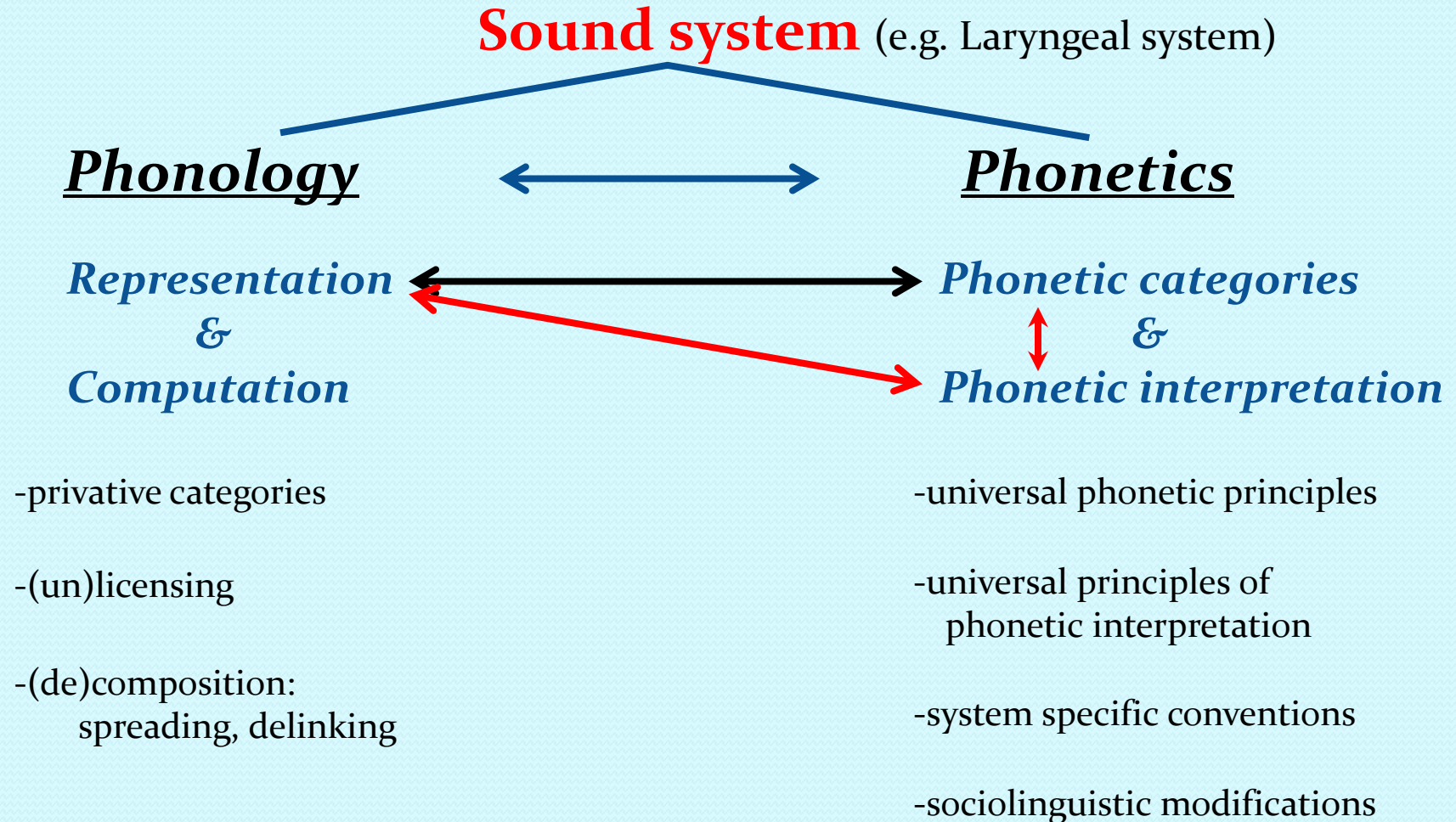   - Neutralization $C^{[blue]} \rightarrow C^o$ / {_#, _C}

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

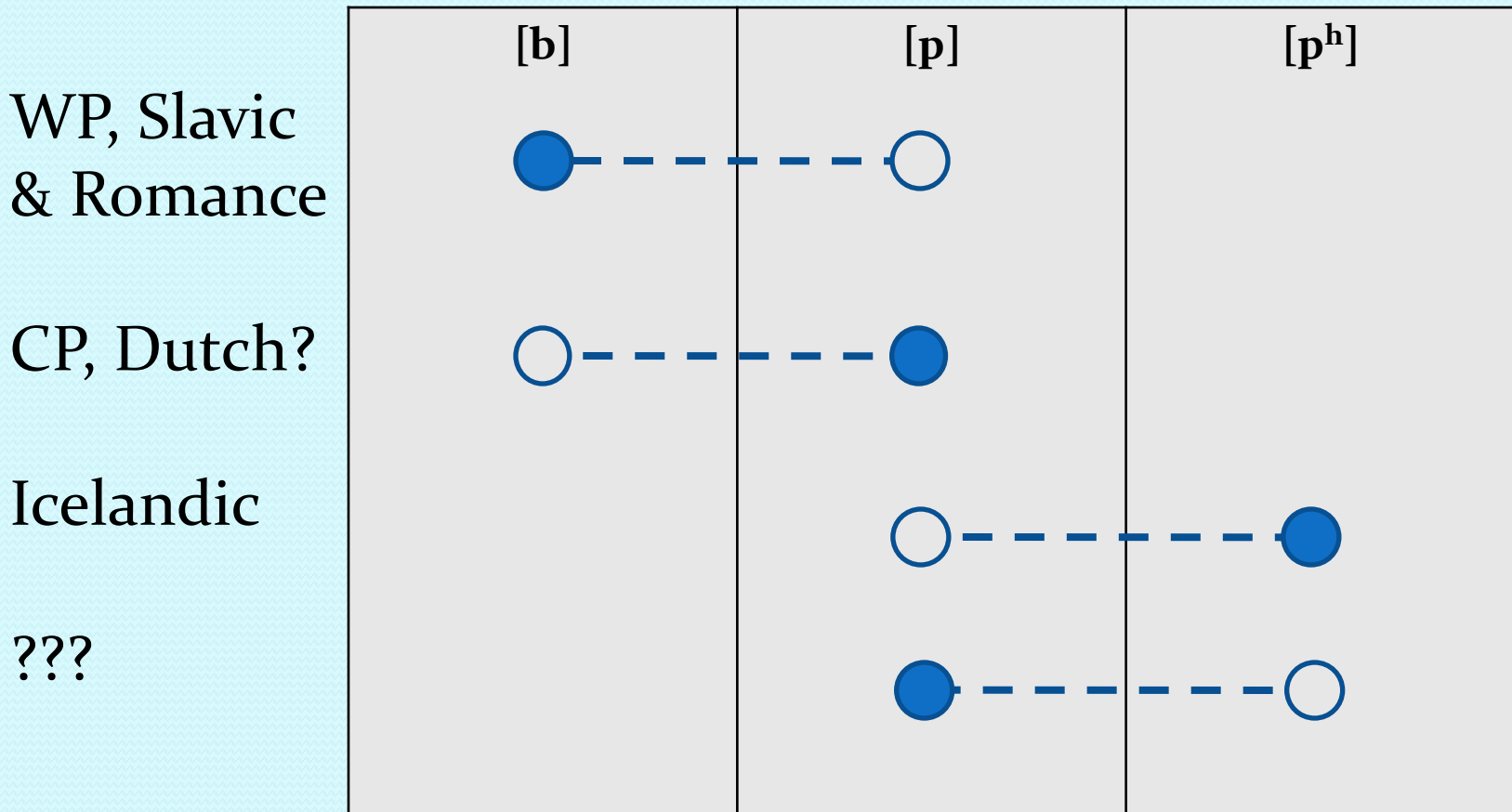# Consequences of this analysis and Laryngeal Relativism

- 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 /tᵒxᵒu/, CP /jakᵒ dᵒobʒe/)
- 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 ⟷ *Phonetics*

Representation & Computation ⟷ *Phonetic categories & Phonetic interpretation*

-privative categories

-(un)licensing

-(de)composition:
  spreading, delinking

-universal phonetic principles

-universal principles of
  phonetic interpretation

-system specific conventions

-sociolinguistic modifications

Typology of two-way systems

phonetic categories

	[b]	[p]	[pʰ]
WP, Slavic & Romance	●	○	
CP, Dutch?	○	●	
Icelandic		○	●
???		●	○

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

phonetic categories

	[b]	[p]	[pʰ]
WP, Slavic & Romance CP, Dutch?	○ - - - - - ●		
Icelandic		○ - - - - - ●	
Swedish???	○ - - - - -		●
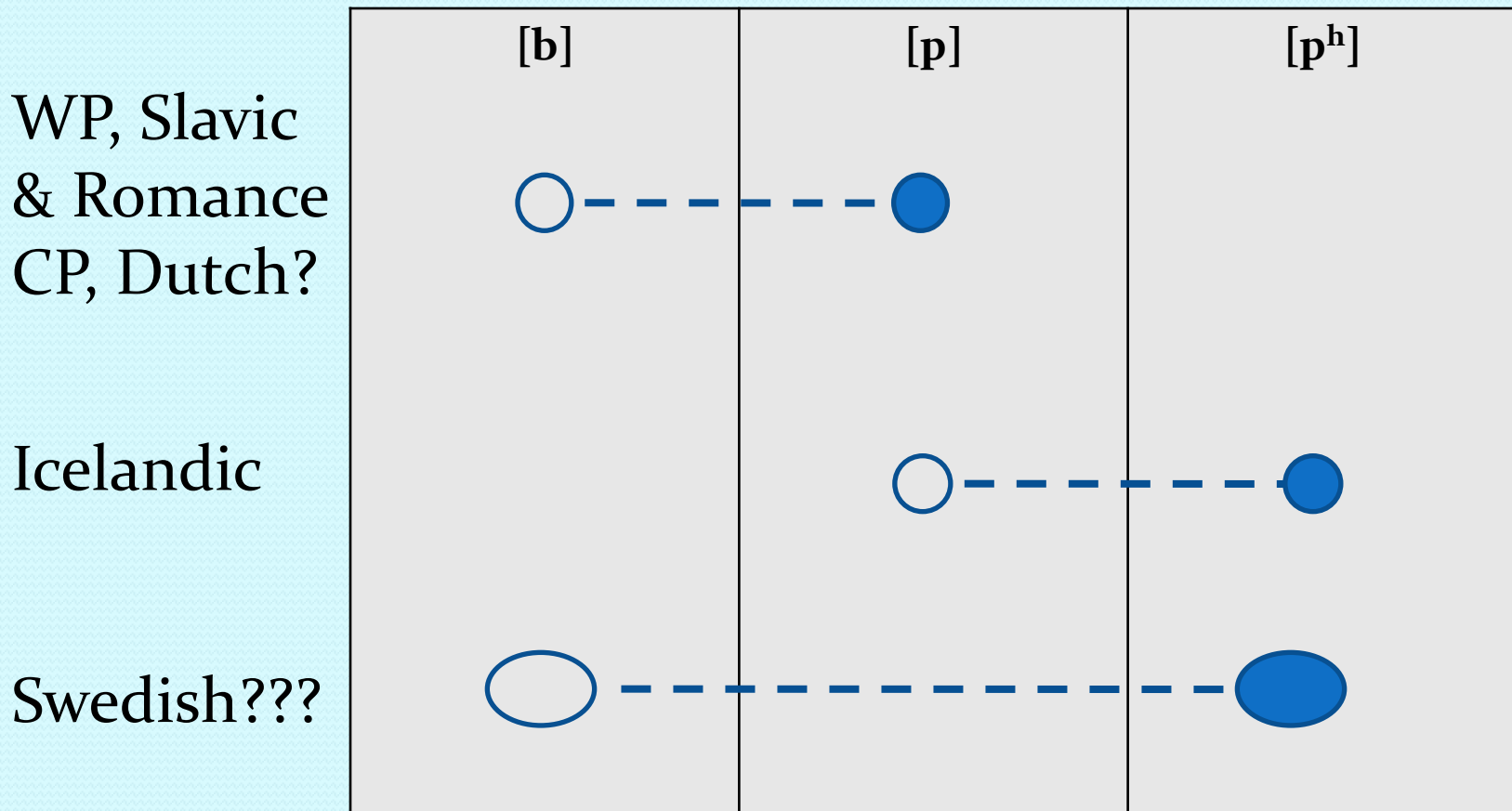
Old and new types of bias concerning laryngeal phonology

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 acquistion/phonologization, e.g.:
  - Arbitrariness, privativity > emergent, substance-free features
  - Rules
- Small and rather beautiful Phonology
  - Phonological theory restricted by the above

Some references

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