Syntax in Phonology? C-Command Over Strings

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You can get the slides here under "News"

Take-Home Message

A cross-module restriction on well-formedness conditions:

Domain	Phonology	Syntax
bounded	intervocalic voicing	subcategorization
unbounded	sibilant harmony	movement
b + **u**	non-final RHOL	c-command
b + **u** + **b**	*first-last harmony	*sibling of c-commandee

The Main Conjecture: Ban on Improper Locality

Once unbounded, always unbounded.

This talk is mostly about the **phonology** column.

Methodology

- Only **phonotactics** considered (no input-output mappings)
- **Subregular** phonology as measuring rod for complexity (Heinz 2009, 2010; Heinz et al. 2011; Chandlee 2014; Jardine 2016; McMullin 2016; Graf 2017)

1. define different classes of grammars
2. organize these classes into an expressivity hierarchy
3. needed level of expressivity?

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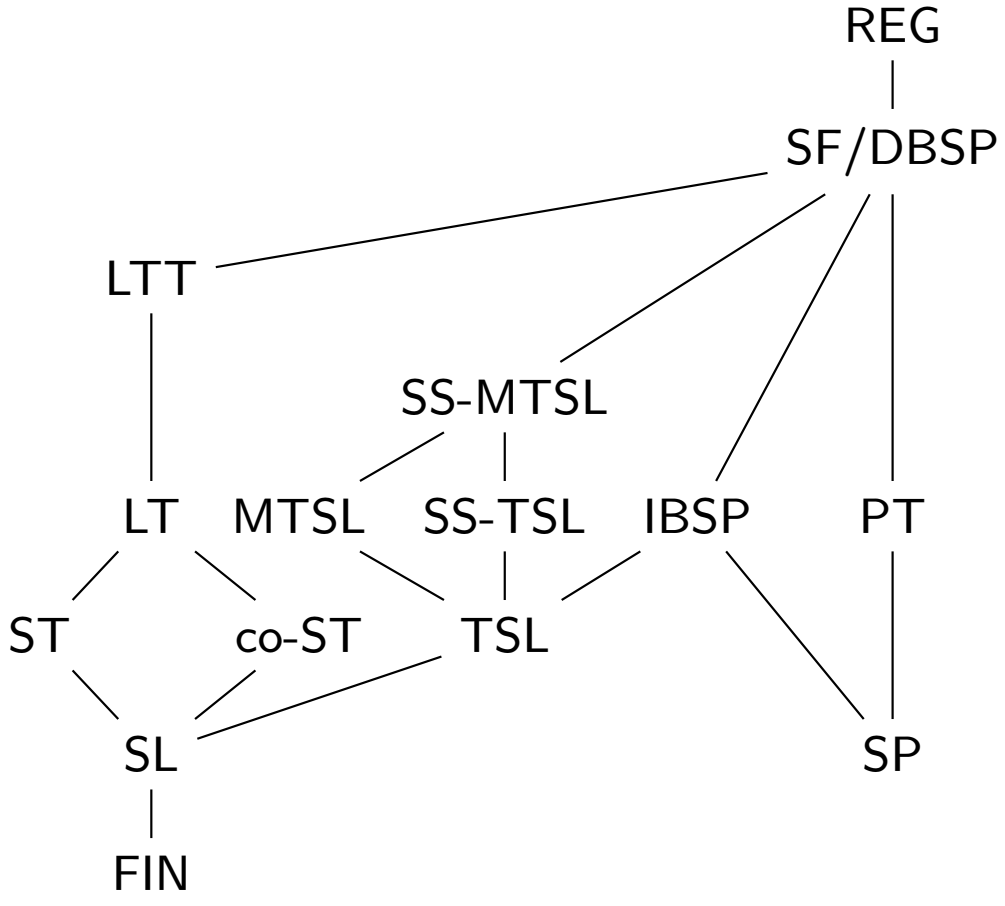

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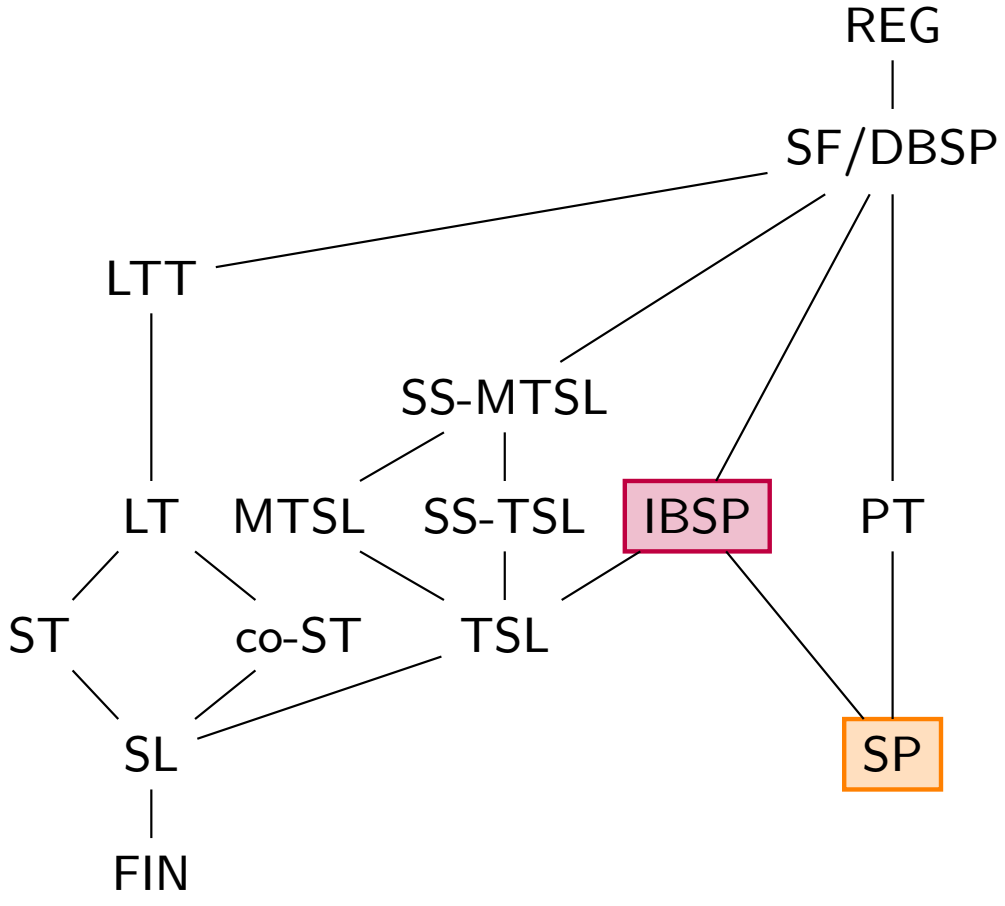


Outline

Unbounded Phenomena in Phonology

1. **Samala Sibilant Harmony**
   Sibilants must not disagree in anteriority.

   (1) a. * hasxintilawaʃ
   b. * haʃxintilawas
   c. haʃxintilawaʃ

2. **Unbounded Tone Plateauing** (UTP)
   No L may occur within an interval spanned by H.

   (2) a. LHLLLLL
   b. LLLLLHL
   c. * LHLLLHL
   d. LHHHHHL

Strictly Piecewise Dependencies

- Each phenomenon can be represented by a collection of finitely many **forbidden subsequences**.

Phenomenon	Constraint	Forbidden Subsequences
Sibilant harmony	$^*[\alpha$ ant$]\cdots[-\alpha$ ant$]$	s$\cdots$ʃ , ʃ$\cdots$s
UTP	*H$\cdots$L$\cdots$H	H$\cdots$L$\cdots$H

- A well-formedness condition is **strictly piecewise (SP)** iff it is equivalent to a finite list of forbidden subsequences.

Blocking Effects are Beyond SP

- SP conditions have no notion of locality at all.
- Blocking is a simple form of locality, and hence beyond SP.

Latin L-Dissimilation (Simplified)

- /l/ in morpheme /-alis/ becomes /r/ if stem contains /l/

  (3) a. * lupanalis

  b. lupanaris

- blocked by intervening /r/

  (4) a. fulguralis

  b. * fulguraris

- **Problem for SP**: forbidding l···l for (3a) also rules out (4a)

Locality Domains are Beyond SP

- There is also a problem with the SP account of UTP.
- *H···L···H bans any L between H, no matter what.
- But tone processes are known to also apply across words.
- Unless we limit representations to single words, *H···L···H overapplies.

(5) a. *LHLLLHLL

b. LHL$LHLL

- The word boundary $ should block tone plateauing, but blocking effects are not SP.

SP + Locality = IBSP

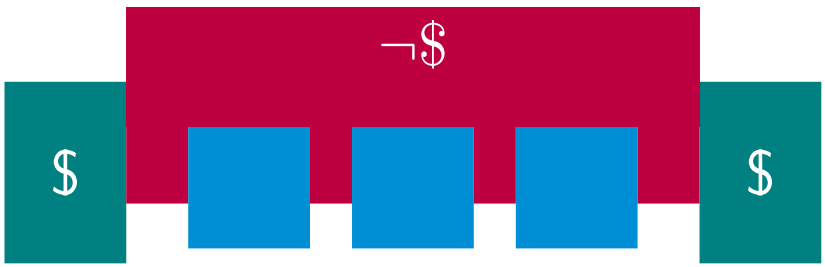
- The central problem of SP is the lack of locality domains.
- **Danger:** arbitrary domains push SP to DBSP $\Rightarrow$ too powerful
- **Restricted version:** SP limited to specific intervals

Interval-Based Strictly Piecewise (IBSP)

1. Finite list of forbidden subsequences
2. Application domain, encoded as **k-val**

3-val for UTP

- Forbidden subsequence: *HLH
- Locality domain:
  - spans between two $,
  - and no other $ occurs between them.
- Represented as a 3-val:



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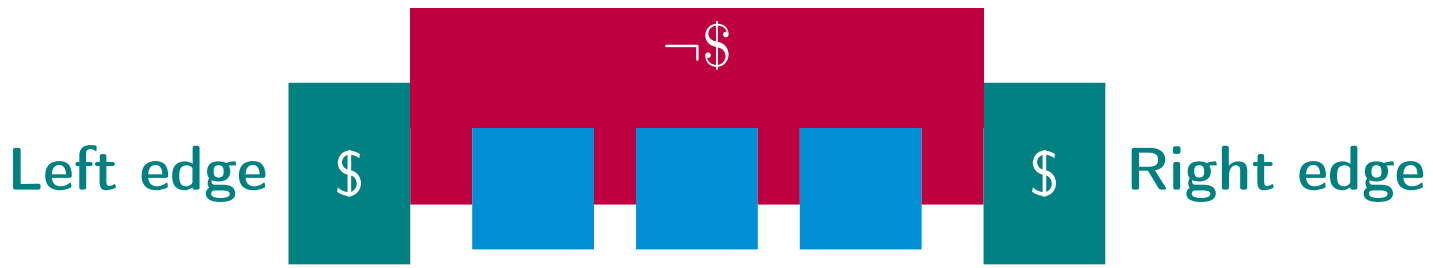

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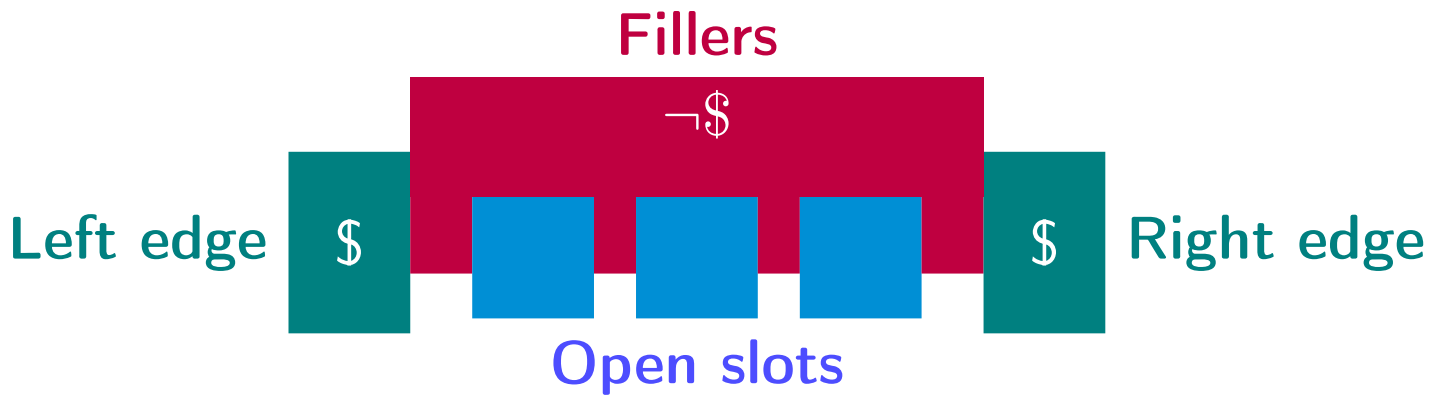

Restricting *HLH with the k-Val

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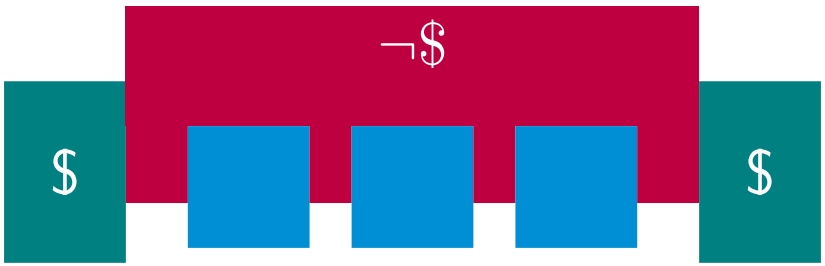

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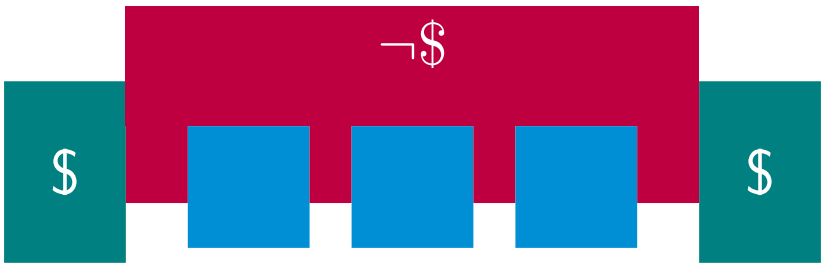

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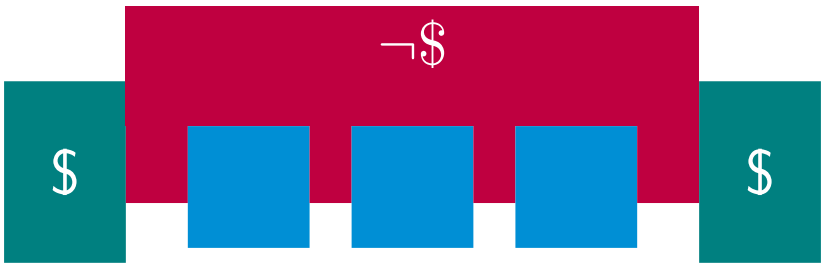

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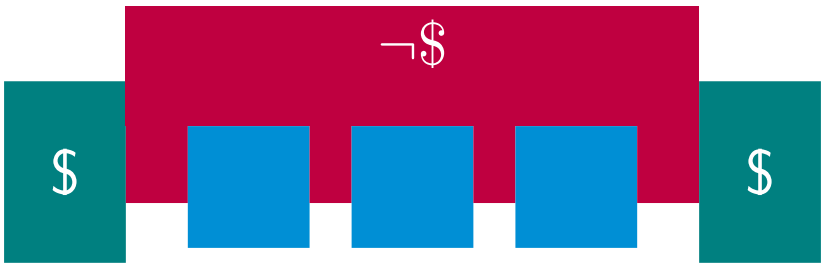

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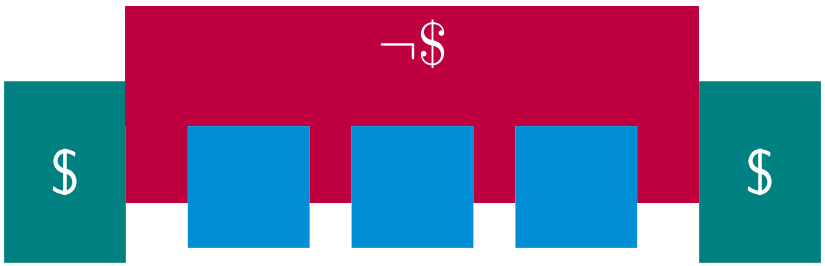

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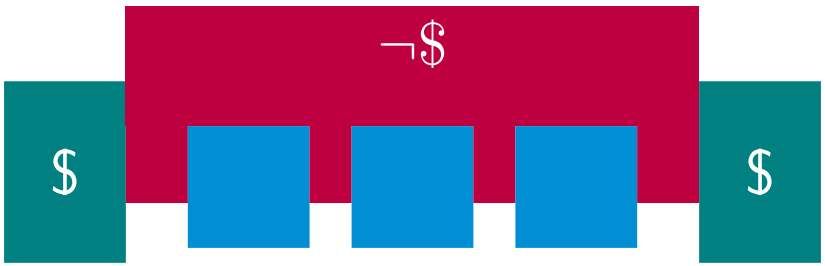

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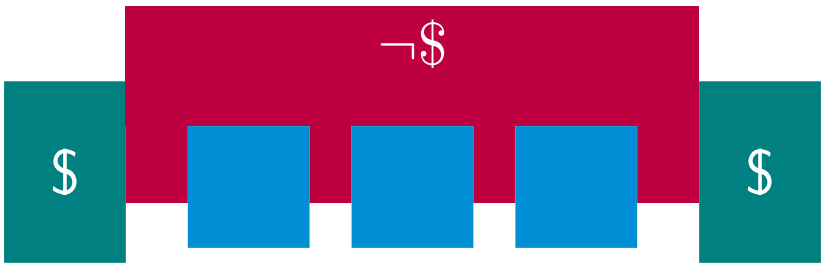

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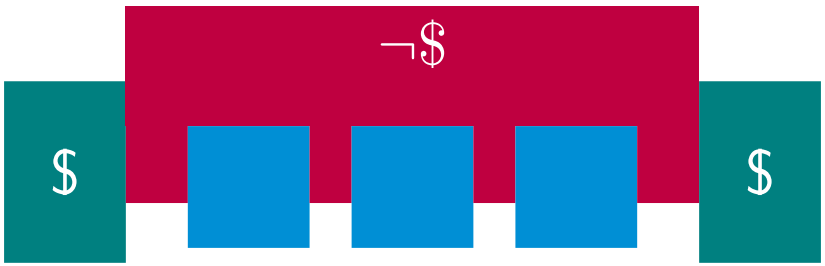

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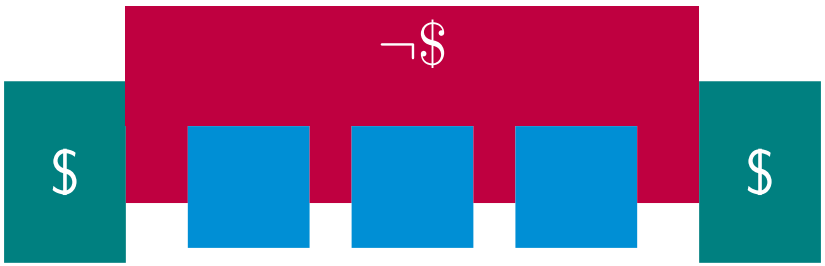

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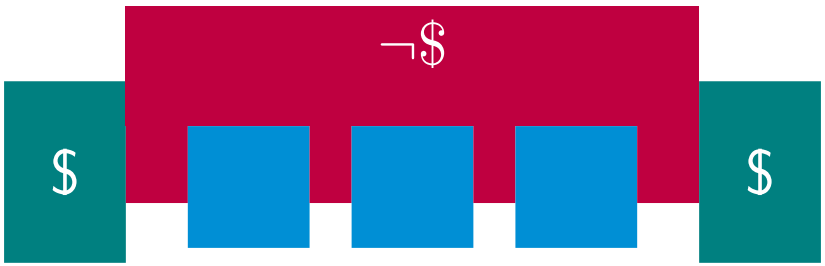

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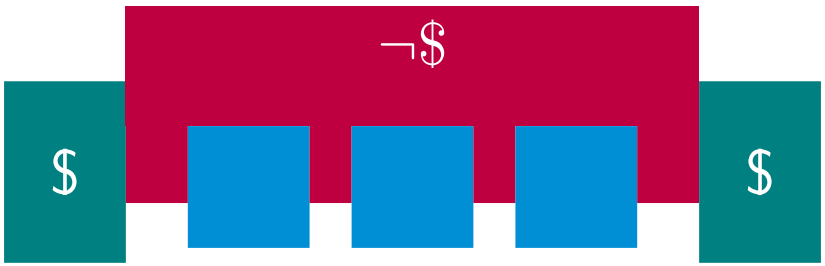

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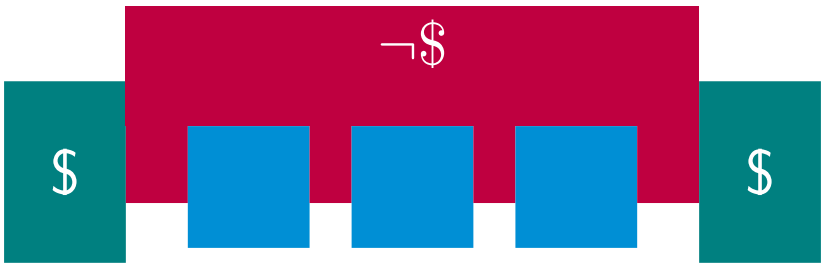

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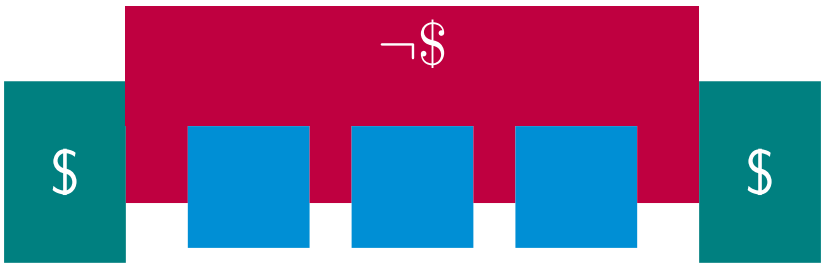

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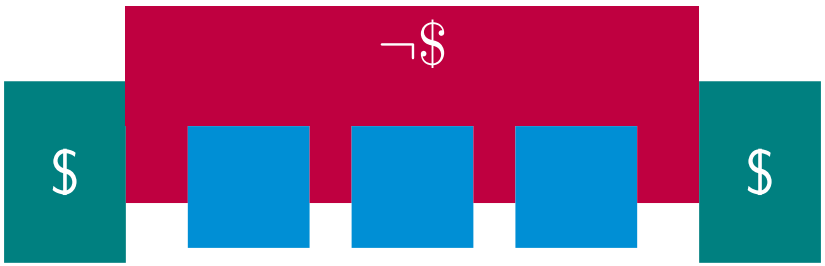

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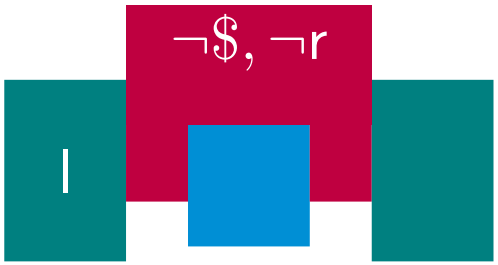
- With a peculiar domain:



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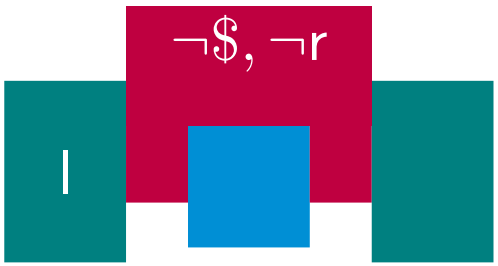

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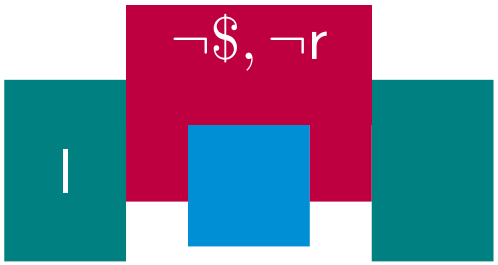

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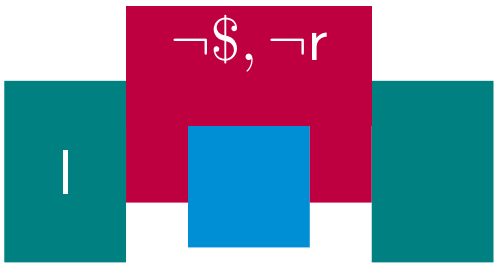

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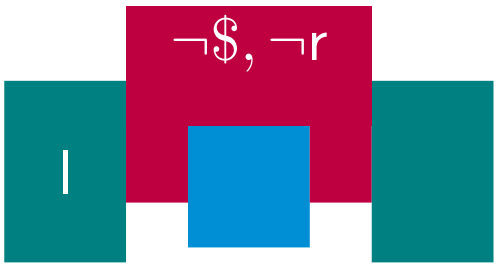

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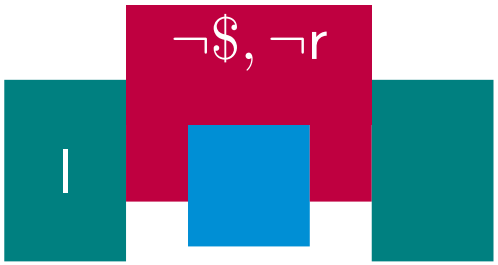

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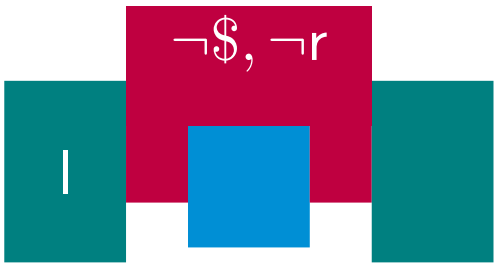

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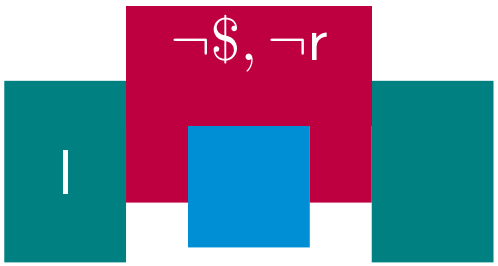

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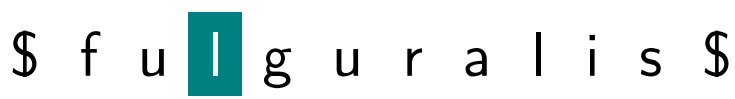

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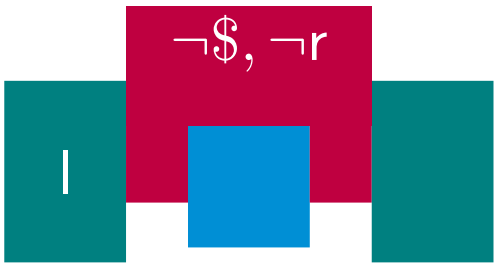

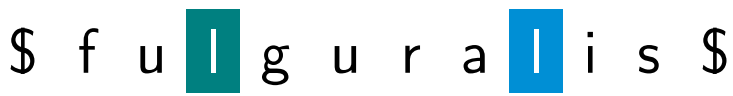

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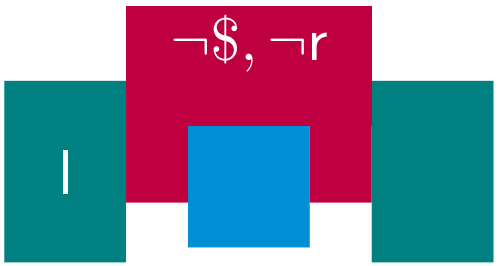

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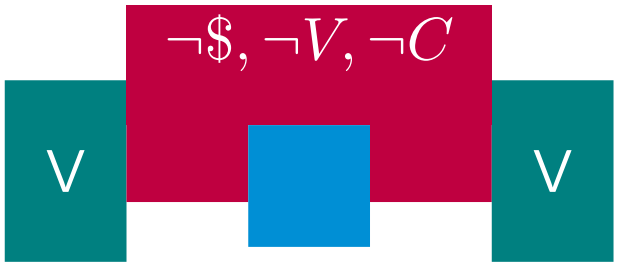

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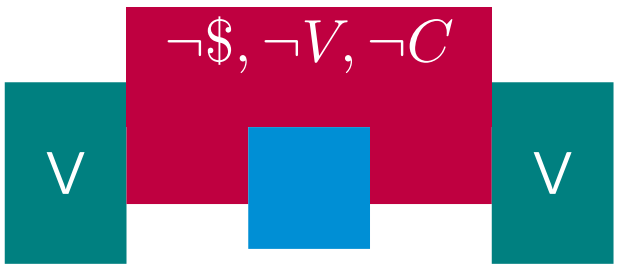

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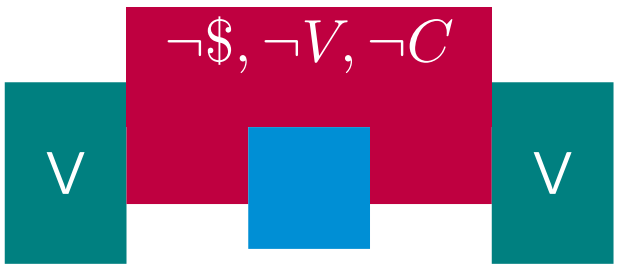

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Local Constraints are IBSP

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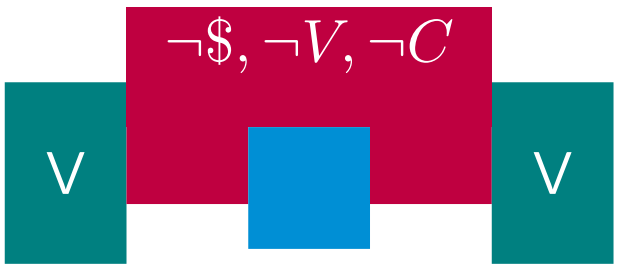

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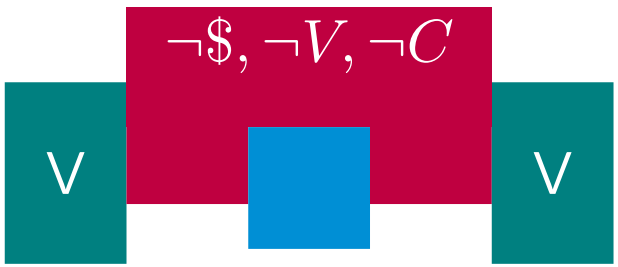

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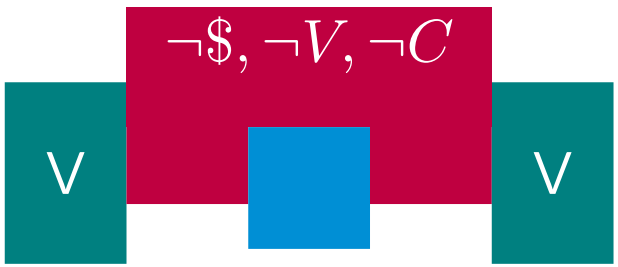

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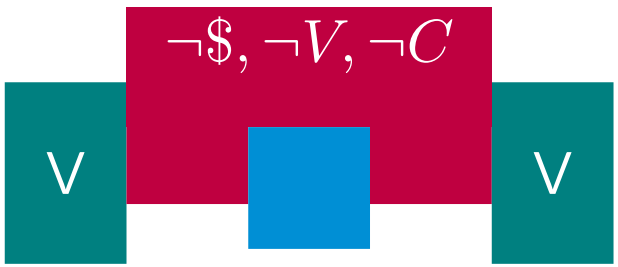

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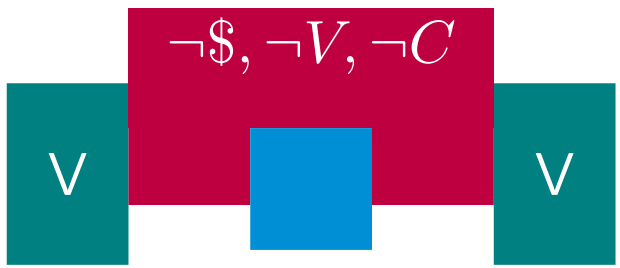

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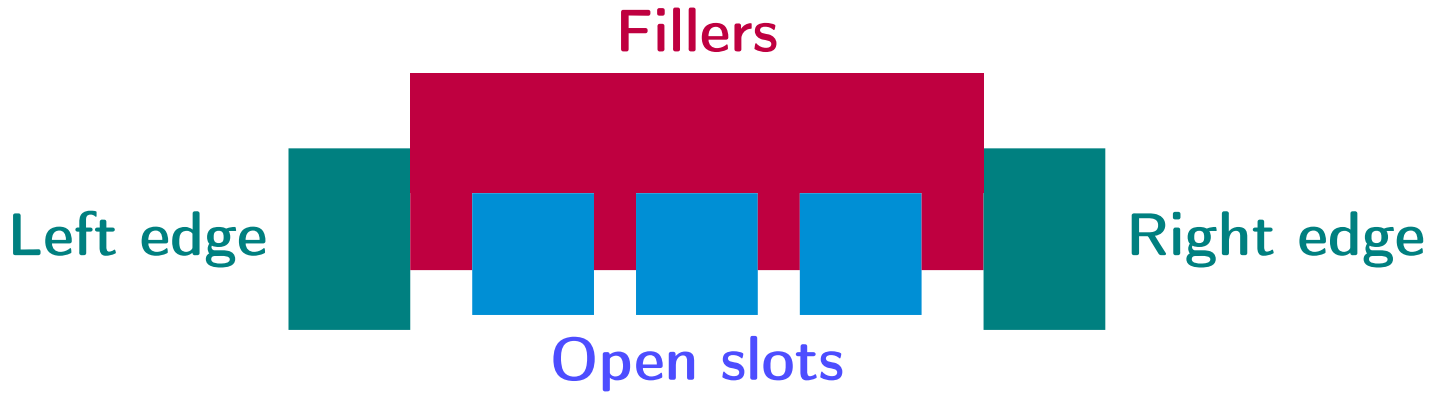
Prediction: Local and Non-Local Do Not Mix

- All k-vals follow the same base template:



- To enforce adjacency, we have to ban all potential fillers.
- But without fillers, we get **adjacency across the board**!

- **IBSP Prediction:** Local and non-local do not mix.

Non-Local Local Phenomena Exist!

- The IBSP prediction is **false**!
- Some phenomena combine local and non-local information:
  1. non-local blocking of local dissimilation (Samala)
  2. non-final RHOL (Eastern Cheremis, Dongolese Nubian)
  3. non-local trigger of bounded tone spreading (Copperbelt Bemba)
- **Conclusion:** IBSP needs a more fine-grained notion of k-val.

Non-Local Blocking of Local Dissimilation

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   [sn], [sl], [st] are forbidden. . .
2. **. . . With Non-Local Blocking**
   . . .unless there is another [s] later on in the same word

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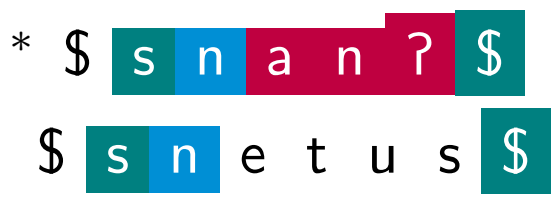

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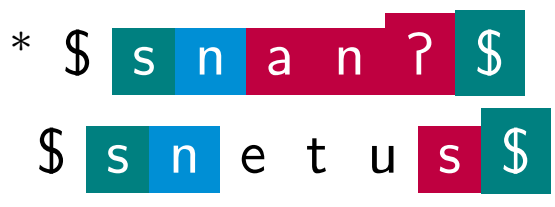

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*	$	L	Ĺ	H	H	H	$
*	$	L	L	Ḧ	H	H	$
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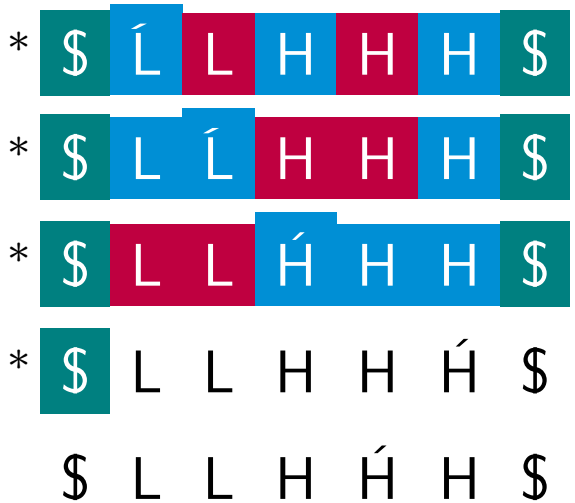

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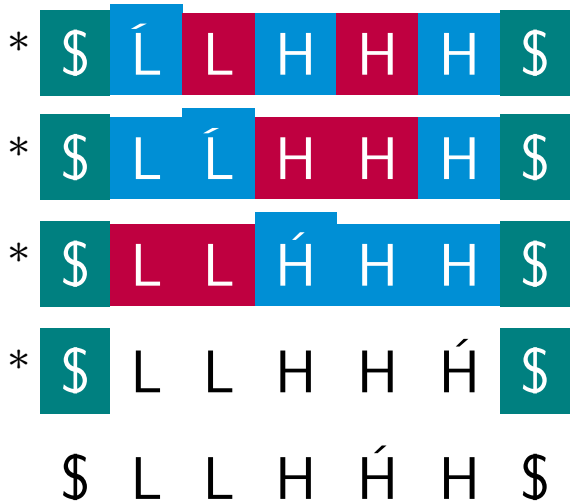

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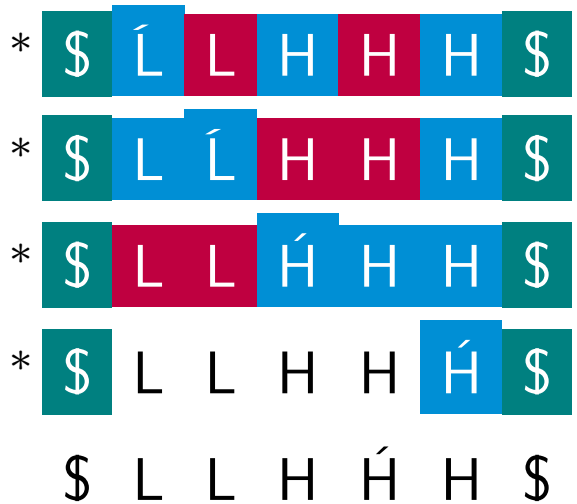

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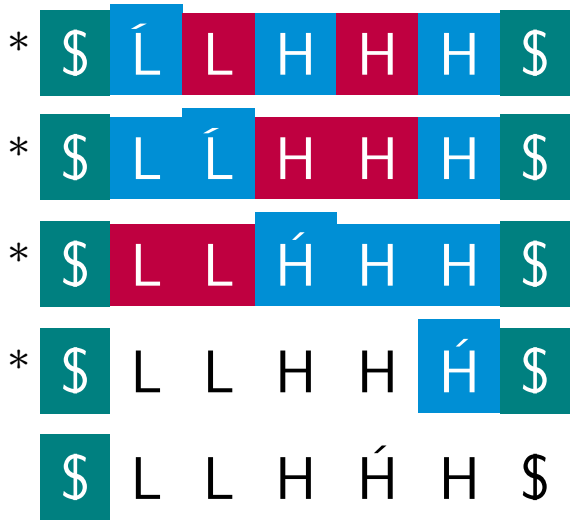

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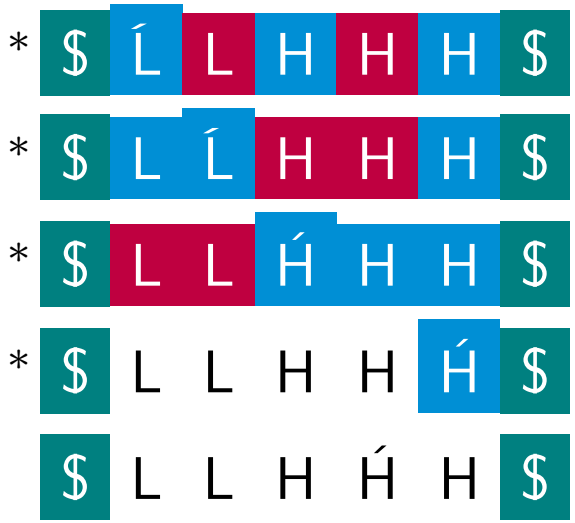

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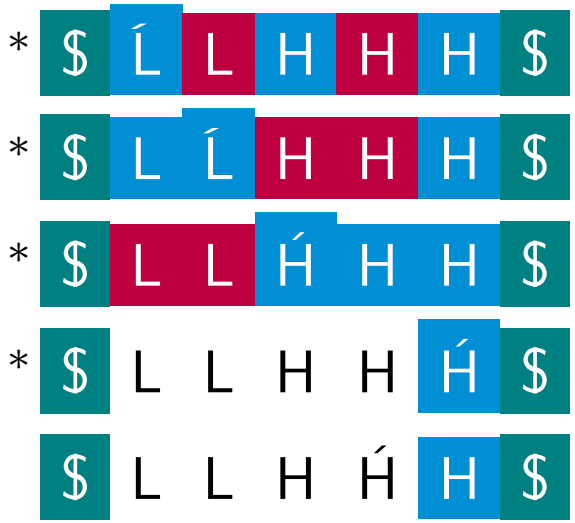

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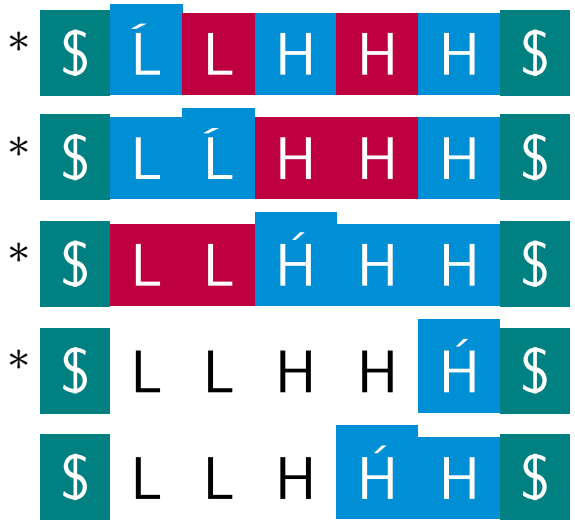

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- But this easily leads to typological overgeneration.

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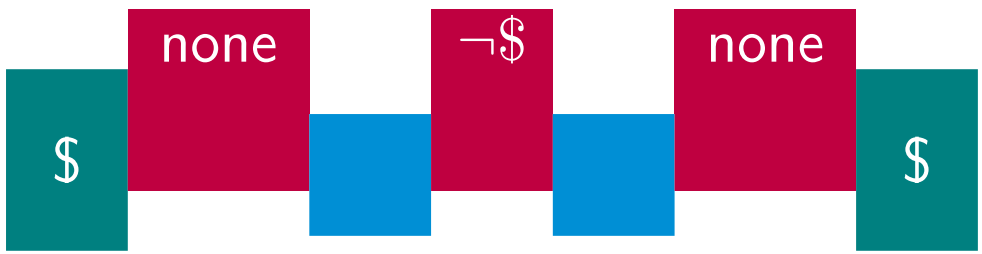

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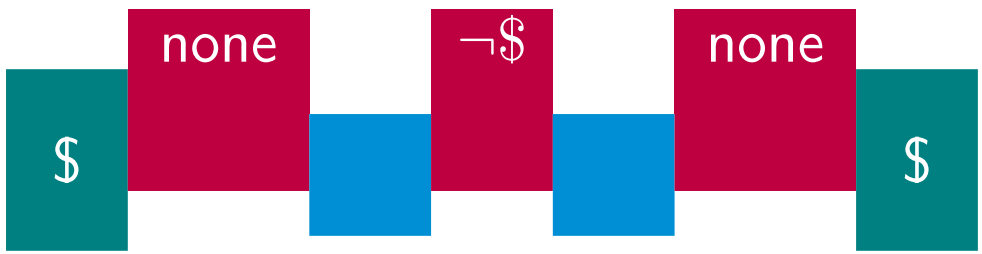

- This produces **First-Last harmony (FLH)**, which is **unattested**.

Proposal: k-Vals Must be c-Command-Like

- What separates FLH from the attested cases?
- k-val for FLH relaxes locality, then tightens it again (local + non-local + local)
- Attested cases are of the form
  - local + non-local, or
  - non-local + local
- This is similar to **c-command**.

c-Command as Local + Non-Local

x c-commands y (in a strictly binary branching tree) iff

local x has a sister z, and

non-local z reflexively dominates y.

Deepening the Connnection: Monotonicity

Ban On Improper Locality

Within a k-val, the degree of locality must be

- monotonically increasing, or
- monotonically decreasing.

- **Monotonicity in syntax**
  - Subcategorization $<$ A-Move $<$ A′-Move
  - Once you've undergone a higher operation, you can't participate in lower ones anymore.
- **Monotonicity in morphology**
  - *ABA follows from monotonicity.
- **Monotonicity in semantics**
  - Everywhere...

Summary

- SP bans subsequences $\Rightarrow$ no locality at all
- Adding locality domains to SP greatly increases its power.
- But IBSP with simple k-vals is still too weak.
- Adding c-command-like locality domains
  - grants enough expressivity
  - while avoiding overgeneration.

Main Prediction

- *local + non-local + local (*LNL)
- No phonological dependency involves two local "clusters" at arbitrary distance from each other.

Next Steps

1. Check the prediction.
2. Explore the syntax column.
3. Go beyond monotonicity in deriving the limitation.

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