Morpheme-structure constraints: non-existent, an exceptional residue, or ubiquitous?

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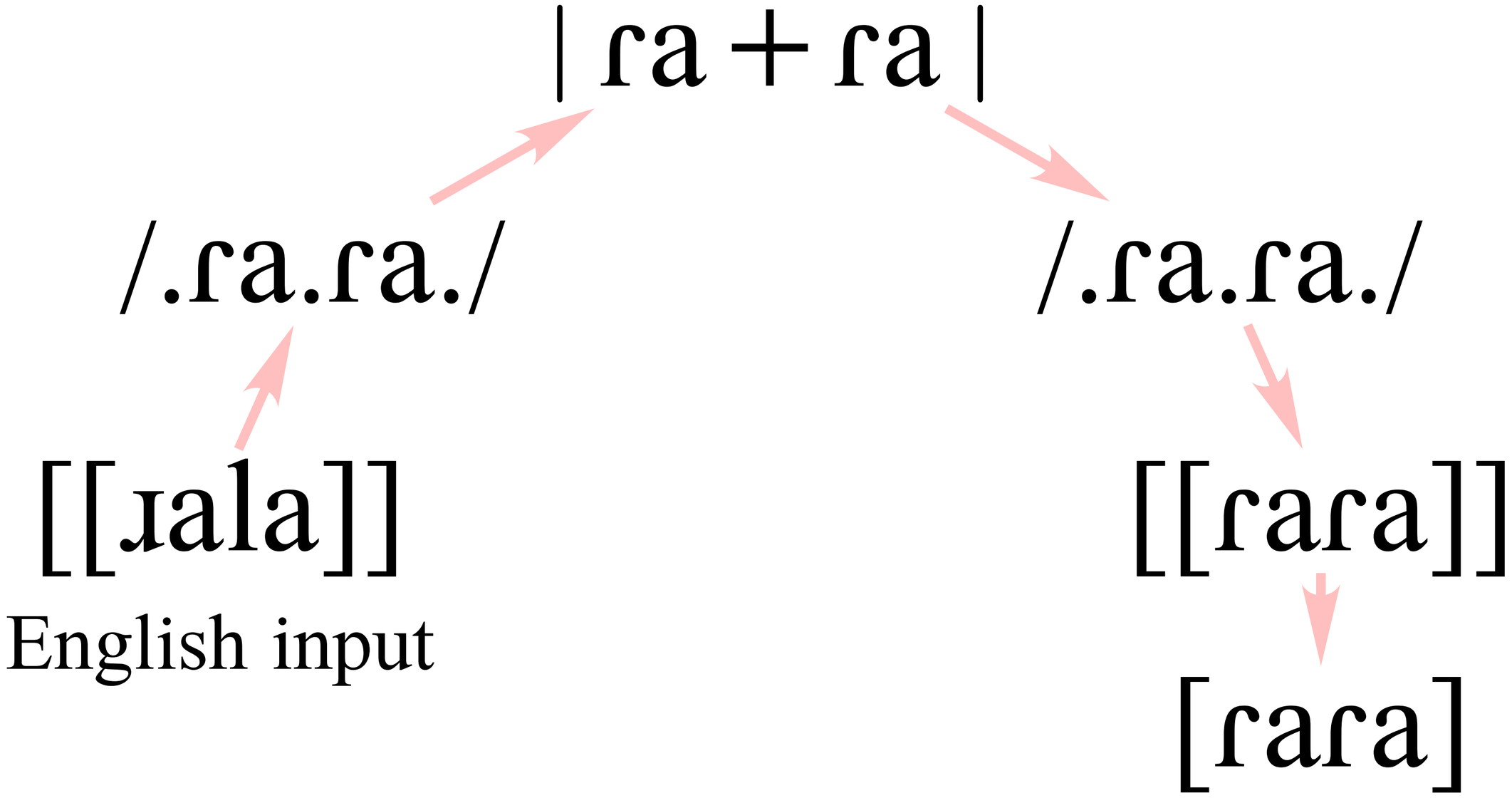
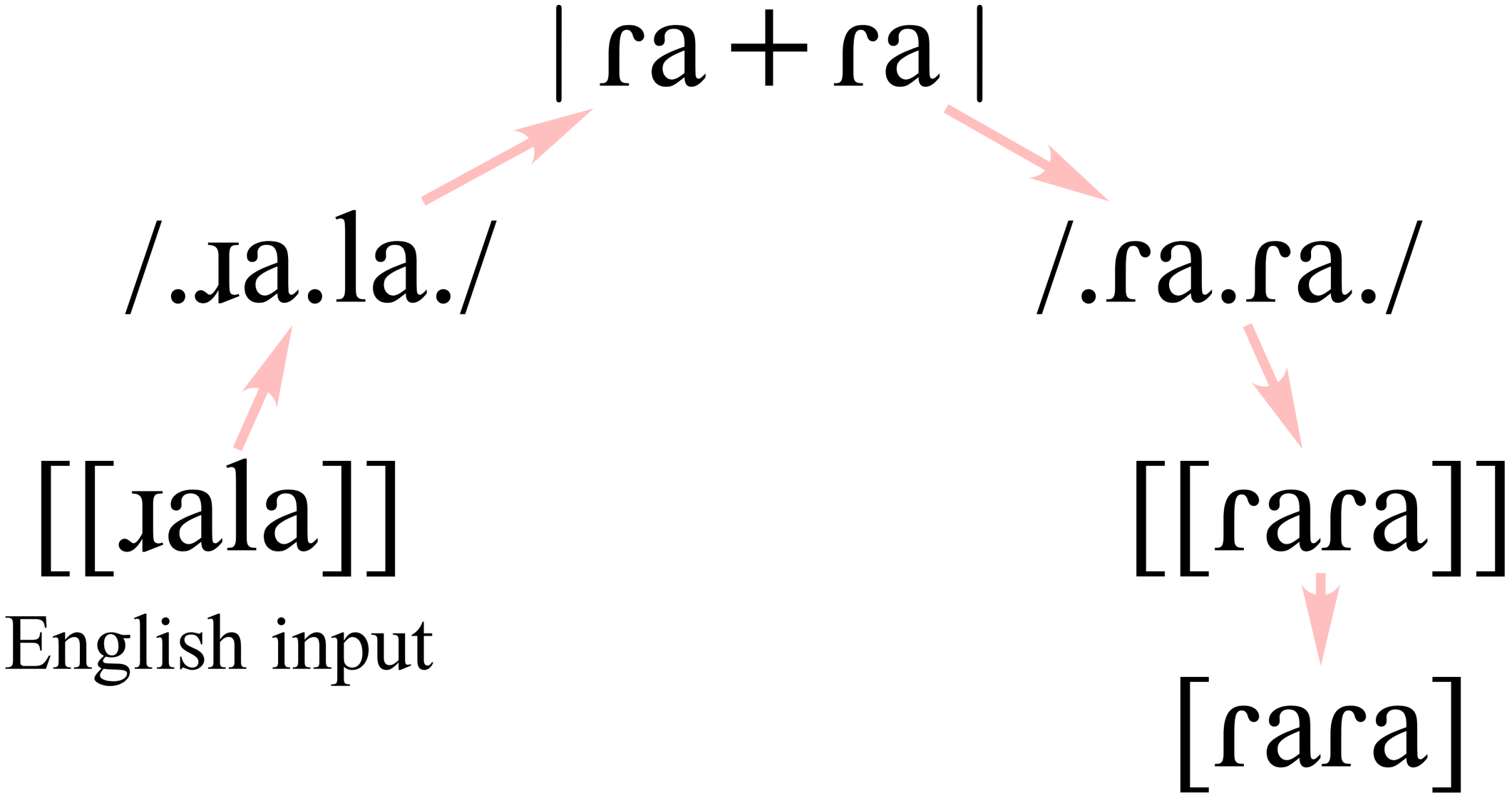
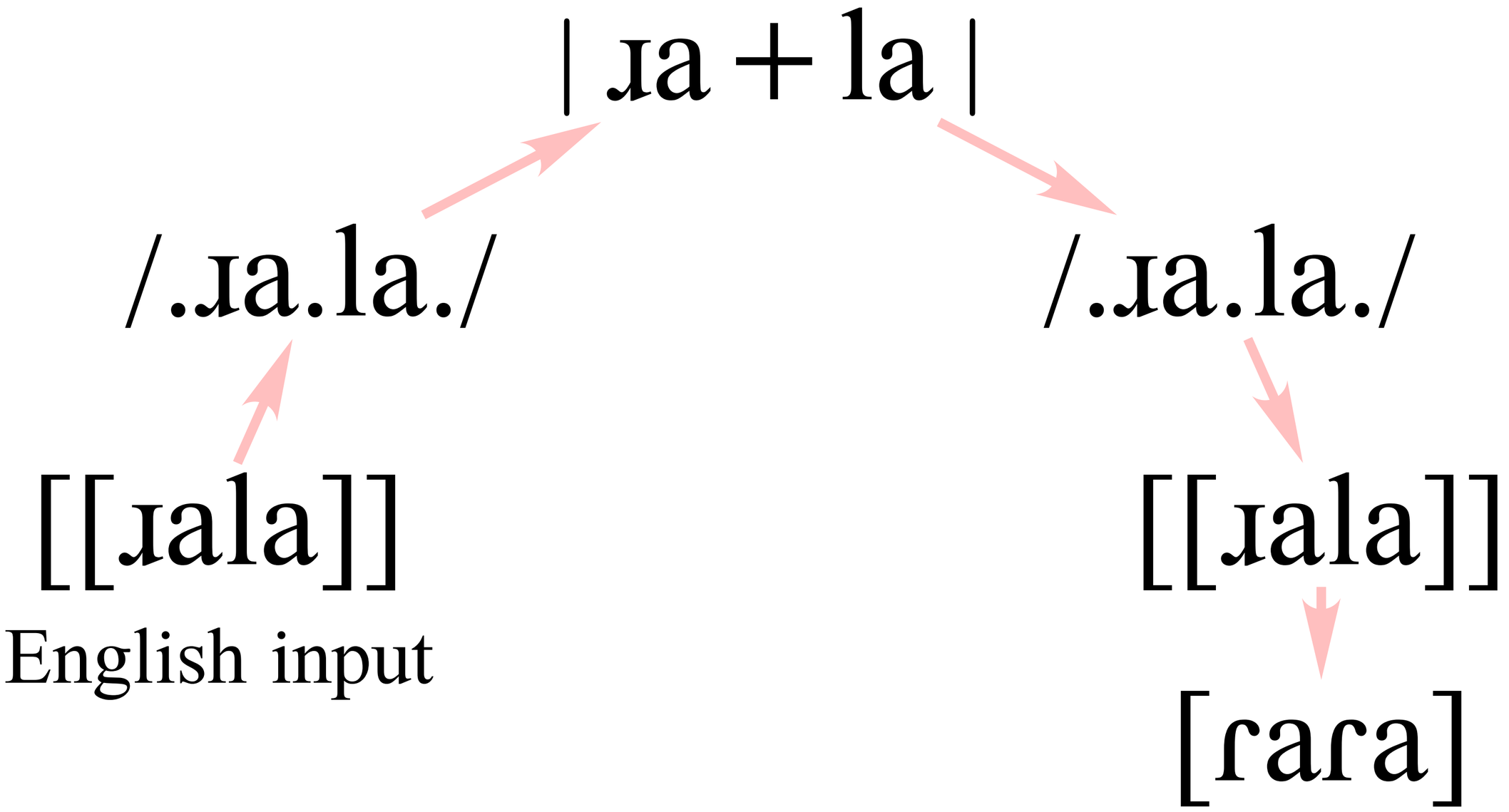
Liquid contrast: perceptual problem



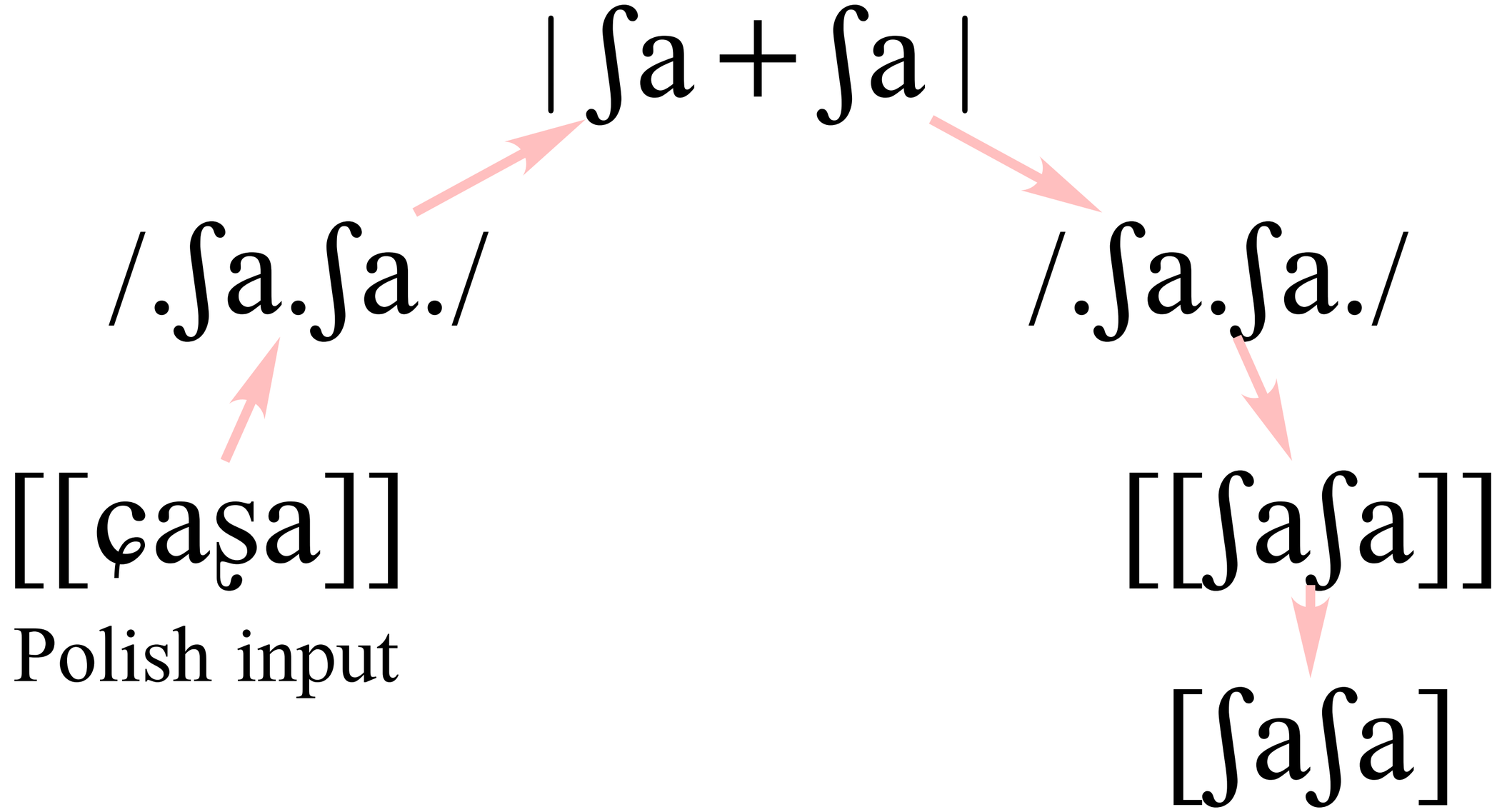
Liquid contrast: lexical problem



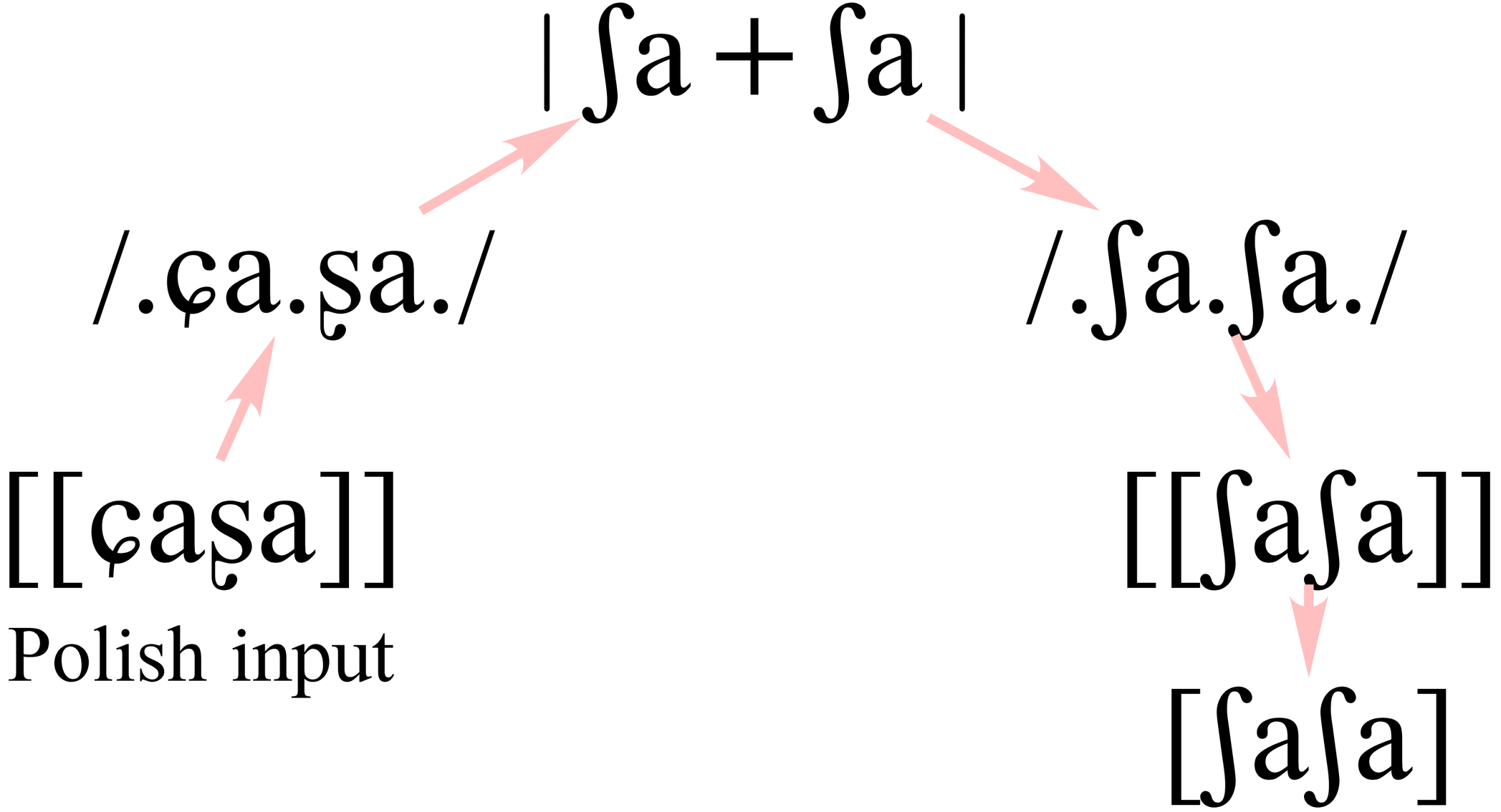
Liquid contrast: articulatory problem



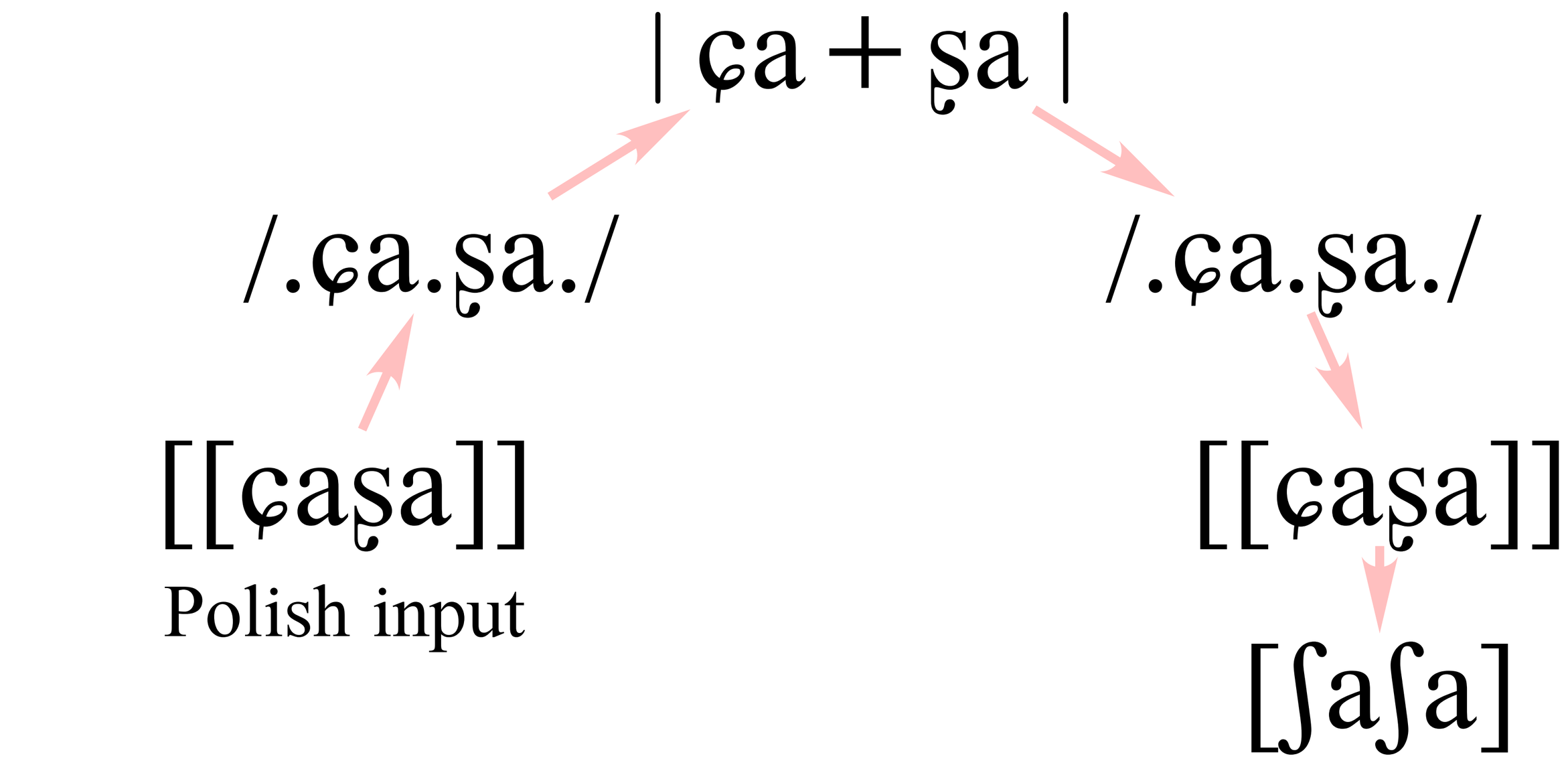
Sibilant contrast: perceptual problem



Sibilant contrast: lexical problem



Sibilant contrast: articulatory problem



Loci of problems

- Perception: cues, surface structure
- Lexicon: faithfulness, morpheme structure
- (Phonological production: faithfulness, surface structure)
- (Phonetic implementation: cues, sound)
- Articulation: sensorimotor knowledge, muscles

Why OT has no MSCs: direction

- The direction is always production
- Input: |Underlying Form| (phonological lexicon)
- Output: /Surface Form/ (e.g. prosodic structure)

Why OT has no MSCs

- Surface-structure constraints are potent (Richness of the Base):

| bnɪk |	*[plos nas]	FAITH
/.bnɪk./	*!	
☞ /.nɪk./		*
☞ /.bə.nɪk./		*

∴ Structural constraints *can* work at SF

Why OT has no MSCs: shared UF

- Morpheme-structure constraints are impotent:

	* | plos nas |	*/plos nas/	FAITH
| bnɪk | /.bnɪk./	*	*!	
☞ | bnɪk | /.nɪk./	*		*
☞ | bnɪk | /.bə.nɪk./	*		*

∴ Structural constraints *cannot* work at UF

Optimality Theory dogma since 1993

- All phonology works from UF to SF

∴ Structural constraints *cannot* work at UF

∴ **There are no Morpheme Structure Constraints**

- Structural constraints *can* work at SF
- All structural constraints *must* work at SF alone

Lexicon optimization in OT

- |bnɪk| can be ruled out indirectly:
- 1. */plos nas/ rules out /.bnɪk./, giving /.nɪk./ or /.bə.nɪk./
- 2. faithfulness constraints between SF and UF force /.nɪk./ or /.bə.nɪk./ to be copied to |nɪk| or |bənɪk|

When MSCs are necessary

- A language where a verb root has to be $C_1C_2(C_3)$ (Semitic)
- Impossible or awkward when this has to be handled at SF
- Awkward means diacritic and/or level-mixing

$\therefore$ MSCs should be allowed back into phonological theory

When MSCs are cool

- At most one breathy voiced consonant in a root (Sanskrit):
  buḍ-am boːḍ-ati b̤ut b̤ut-su b̤oːtsjati bubboːḍa budḍa

- either

  from underlying | b̤uḍ̤ | (Zwicky 1965, Kiparsky 1965)
  in which case there has to be an MFC *| CVC̤ |

  or

  from underlying | buḍ̤ | (Pāṇini -500, Sag 1973)
  in which case there has to be an MFC *| C̤VC̤ |

Underlying | b̤ud̤ + am |

	b̤ud̤ + am	*/C̤$_1$VC̤$_2$/	FAITH$_2$	FAITH$_1$
	/.b̤u.d̤am./	*!		
☞	/.bu.d̤am./			*
	/.b̤u.dam./		*!	
	/.bu.dam./		*!	*

∴ First underlying breathy voice is deleted on the surface

Underlying | b̤ud̤ + su |

	b̤ud̤ + su	*/C̤$_1$VC̤$_2$/	*/C̤s/	FAITH$_2$	FAITH$_1$
	/.b̤ud̤.su./	*!	*		
	/.bud̤.su./		*!		*
☞	/.b̤ud.su./			*	
	/.bud.su./			*	*!

∴ Second underlying breathy voice is deleted on the surface

Underlying * | biḍ + am |

* | biḍ + am |	*/C̣$_1$VC̣$_2$/	FAITH$_2$	FAITH$_1$
/.b̤i.ḍam./	*!		*
☞ /.bi.ḍam./			
/.b̤i.dam./		*!	*
/.bi.dam./		*!	

∴ Perfectly faithful

Underlying * | biḍ + su |

* | biḍ + su |	*/C̤$_1$VC̤$_2$/	*/C̤s/	FAITH$_2$	FAITH$_1$
/.b̤iḍ.su./	*!	*		
/.biḍ.su./		*!		
/.b̤id.su./			*	*!
☞/.bid.su./			*	

∴ Breathy voice is not preserved, oops!

Conclusion on Sanskrit

- /.bi.d̤am./~/.bit.su./ cannot occur in Sanskrit, because Sanskrit breathiness always hops
- No structural constraint at SF can force hopping of breathiness in * | biḍ̤ + su |
- Lexicon Optimization can rule out English * | bnɪk | from */.bnɪk/, but in Sanskrit “b̤uḍ̤-” is allowed at UF but not at SF, whereas “buḍ̤-” is allowed at SF but not at UF

Lexical optimization working

/.bi.ḍam./	* | C_1VC_2 |	*/C_1VC_2/	FAITH_2	FAITH_1
| biḍ + am |	*!			
☞ | b̤iḍ + am |				*

∴ Morpheme Structure Constraint crucial

The status of Morpheme Structure Constraints

- MSCs are needed for root restrictions in at least two cases:
- if the restrictions can count, as in Semitic roots,
- or if restrictions at UF oppose those at SF, as in Sanskrit * | C_1VC_2 | versus */C_1VC_2/

∴ Morpheme Structure Constraints are ubiquitous and belong in the phonologist's everyday toolset.