On the representational complexity of silence and its morphosyntactic benefits

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Music is in the space between the notes

Claude Debussy/Miles Davis

Language is in the space between audible objects

- Language as the set of conditions holding over the atoms of linguistic representations
- Such atoms do not necessarily need to have an audible counterpart
- Their presence can be argued for on the basis of indirect evidence and/or theory-internal requirements
  - Analogies with overt forms, θ-criterion ...
  - V $\sim \emptyset$ alternation, ECP ...

Inaudible objects

- Morphosyntax
  - Formal features, functional heads (Kayne 2016)
  - Ellipsis sites
  - Lexically silent items (PRO, *pro*, zero morphemes ...)
- Phonology
  - Substance-free phonological features
  - 'Reduction' sites
  - Lexically silent items/prosodic nodes (C, V, N, R, σ)

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The lexical item

In the simplest case, the entry LI is a once-and-for-all collection (perhaps structured) of (A) phonological, (B) semantic, and (C) formal features. The features of (A) are accessed in the phonological component, ultimately yielding a PF-interface representation; those of (B) are interpreted at LF; and those of (C) are accessible in the course of the narrow-syntactic derivation

Chomsky (1999)

Defective lexical items

- Semantic & phonological features
  - *hello*, *ouch*, *yes* ... (Jackendoff 2002)
- Syntactic & phonological features
  - Expletives
  - Relators and linkers
  - *do*-support
- Semantic & syntactic features
  - Functional heads
  - PRO, *pro*, zero morphemes ...

Defective lexical items

the lexicon may contain a number of grammatical formatives that happen to lack phonetic content

van Rimsdijk (2002)

- Absence of phonetic content = absence of phonological content
  - Phonology = phonetics
  - Modularity violation
    - Phonology = formal properties of mind-internal objects
    - Phonetics = physical properties of externalized objects

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Defective lexical items

- If phonetics $\neq$ phonology, then
- Absence of phonetic content $\neq$ absence of phonological content
- Phonetic silence $\neq$ phonological emptiness
- Zero morphemes $\neq$ silent morphemes
- Zero morphemes can have some phonological content

Refining emptiness

- Proposal
  - Silence and phonological emptiness are not the same thing
  - Silence can conceal morphophonological complexity
    - Morphosyntax: not all silent morphemes are phonologically empty
    - Phonology: not all silent C/V positions are phonologically empty
- Technically
  - Strict CV + Turbidity Theory
    - Strict CV: empty positions (EN)
    - Turbidity Theory: formalization of inaubible phonological primes

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Refining emptiness

- Benefits
  - Refined phonological representations help keeping morphosyntax and phonology cleaner
    - Reduce allomorphy (see work by Cavirani, Faust, Lampitelli, Scheer, and Ulfsbjorninn ao)
    - Reduce the need for postsyntactic morphological operations (Cortiula, Starke, Cavirani in prep)
    - Reduce the need for ad hoc phonological parameters
- This talk
  - Marked morpheme linear order with no postsyntactic operations
    - PL marking in Colonnatese nP
  - Consistent morphophonological system with no ad hoc parameters
    - Inflectional markers in Egyptian Arabic VP

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Structure of the talk

1. PL marking in Colonnatese nP
2. Inflectional markers in Egyptian Arabic
3. Stress and length in Egyptian Arabic
4. Conclusion
5. Appendix

PL marking in Colonnatese nP

The puzzle

- nP structure
  - $\sqrt{} + n + \#$ (Marantz 2007)
  - $n = \textsc{gender}$ (Lowenstamm 2008, Picallo 2008, Kramer 2015 ao)
- Mirror principle (Baker 1995)
  - The linear order of the morphological markers of a given form mirrors the syntactic structure of such form
- Prediction
  - $\sqrt{}$-GENDER-$\#$ $\Rightarrow$ Sp. $\sqrt{\text{LOB}}$-a_{F}-s_{PL} 'wolves'

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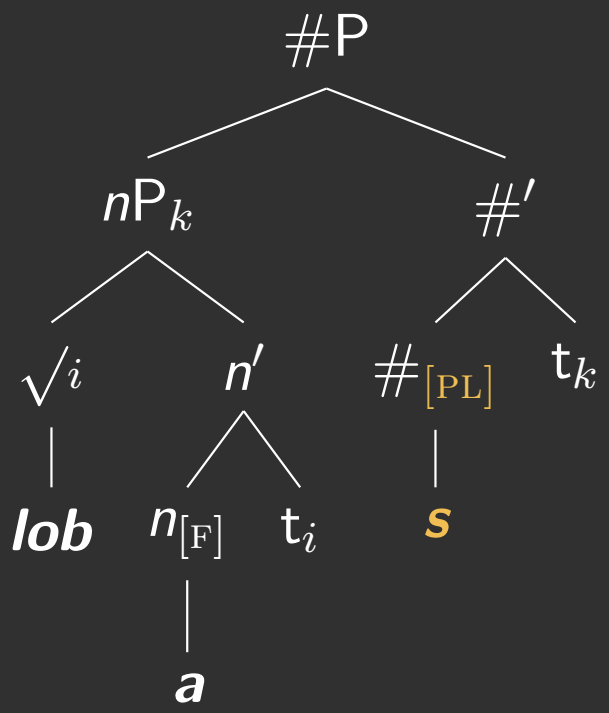
Morphosyntactic account - I

- Sp. $\sqrt{\text{LOB}}$-a_{F}-s_{PL} 'wolves'



- Spec-to-Spec roll-up movement
- $a \Leftrightarrow [\text{F}]$ (cf. $\sqrt{\text{LOB}}$-a_{F} 'wolf')
- $s \Leftrightarrow [\text{PL}]$

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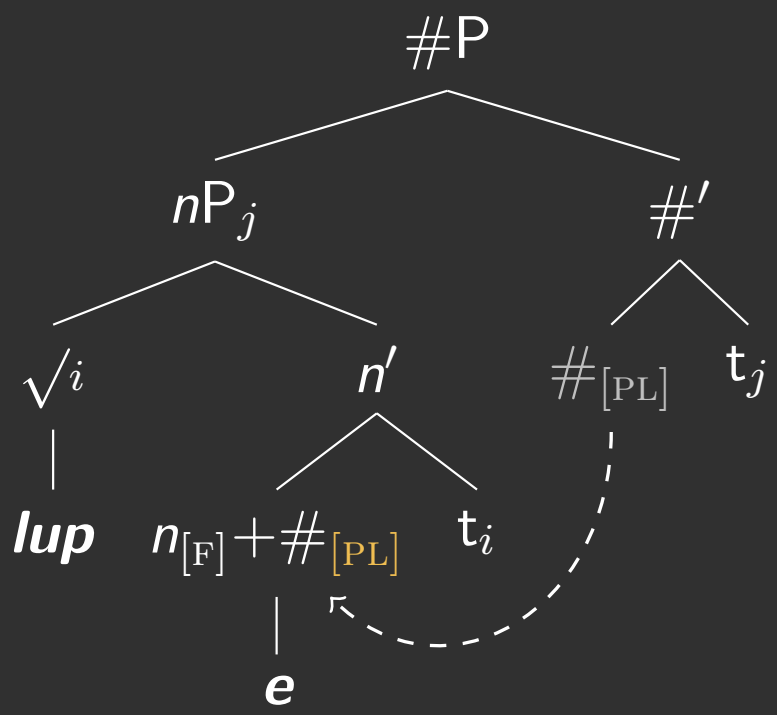

- Spec-to-Spec roll-up movement + fusion: [F] [PL] → [F.PL]
- *a* ⇔ [F] (cf. $\sqrt{\text{LUP}}$-a_{F} 'wolf')
- *e* ⇔ [F.PL]

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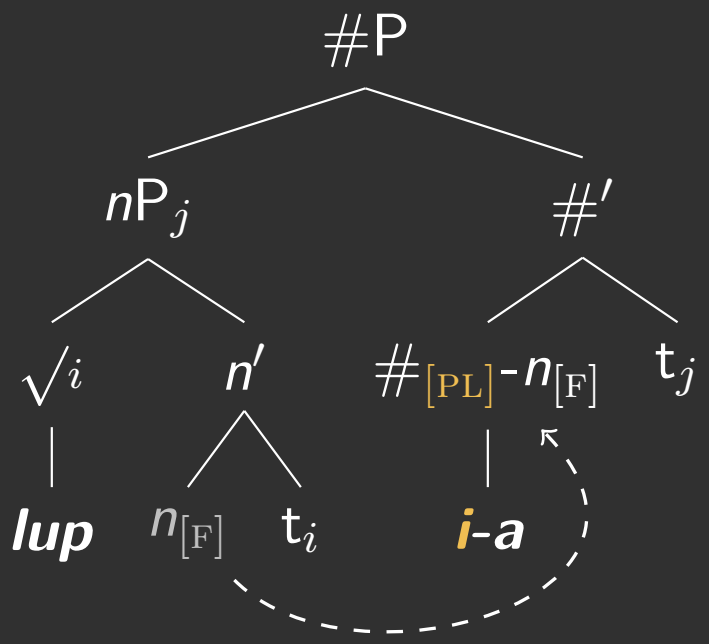


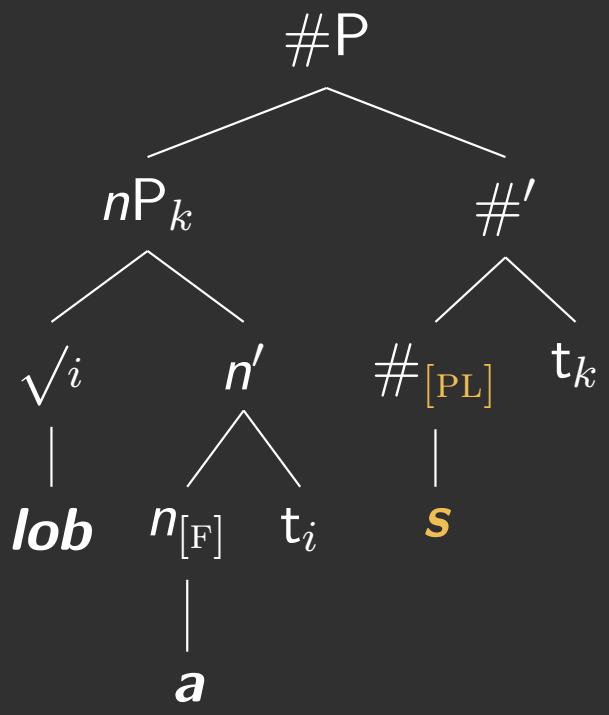
- Spec-to-Spec roll-up movement + m. merger: [F] [PL] → [PL]-[F]
- *a* ⇔ [F] (cf. $\sqrt{\text{LUP}}$-a_{F} 'wolf')
- *i* ⇔ [PL]

Morphosyntactic account - I

- Spanish
  - No post-syntactic operation
- Italian
  - Fusion
- Colonnatese
  - Morphological merger

Morphosyntactic account - II

- Sp. $\sqrt{\text{LOB}}$-a_{F}-s_{PL} 'wolves'



- Spec-to-Spec roll-up movement
- $a \Leftrightarrow [\text{F}]$, $s \Leftrightarrow [\text{PL}]$

Morphosyntactic account - II

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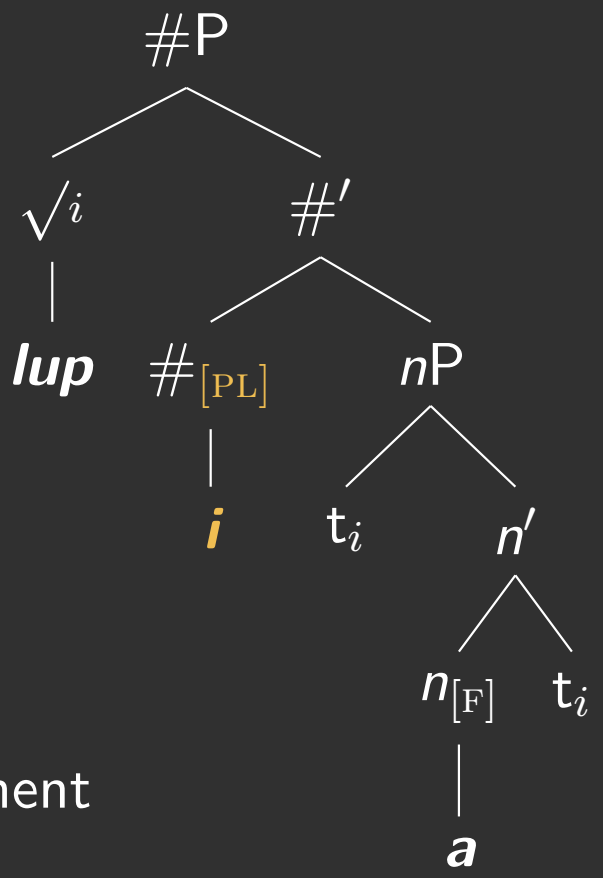

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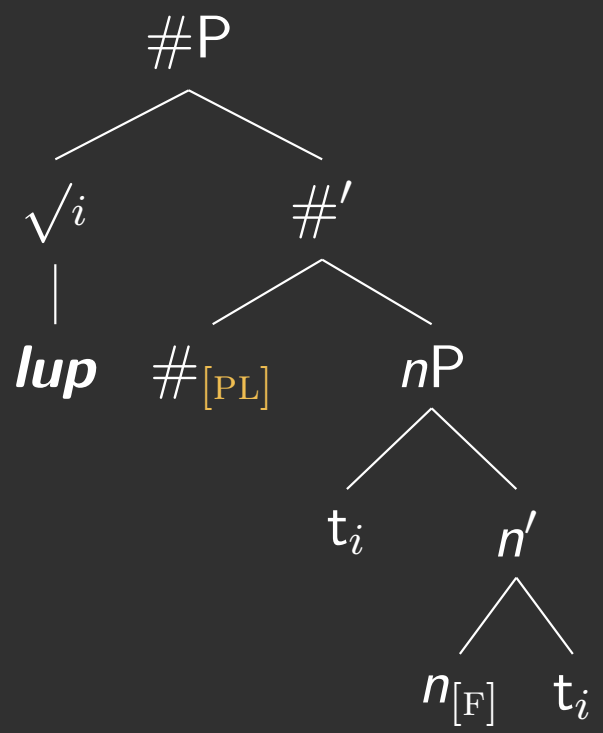

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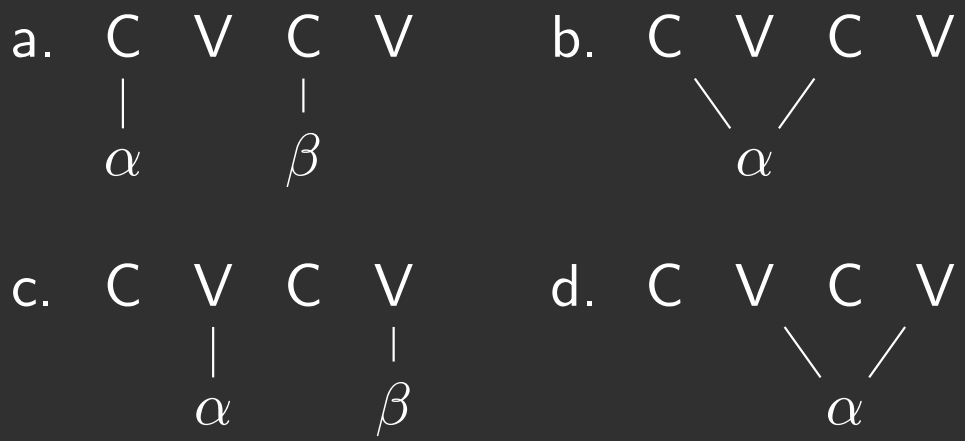
- $a \Leftrightarrow [\text{F}]$, $e \Leftrightarrow [\text{PL}[\text{F}]]$

Morphosyntactic account - II

- Spanish
  - Roll-up movement
- Colonnatese
  - No roll-up movement
  - *a* $\Leftrightarrow$ [F], *i* $\Leftrightarrow$ [PL]
- Italian
  - No roll-up movement
  - *a* $\Leftrightarrow$ [F], *e* $\Leftrightarrow$ [PL[F]]

Strict CV (Lowenstamm 1996, Scheer 2004)

- Phonological strings as CV sequences



- Positions engage in lateral relations (government/licensing)
- Complexity Condition (Harris 1990)
  - Lateral strength $\propto$ representational complexity
  - Representational complexity = number of representational primitives

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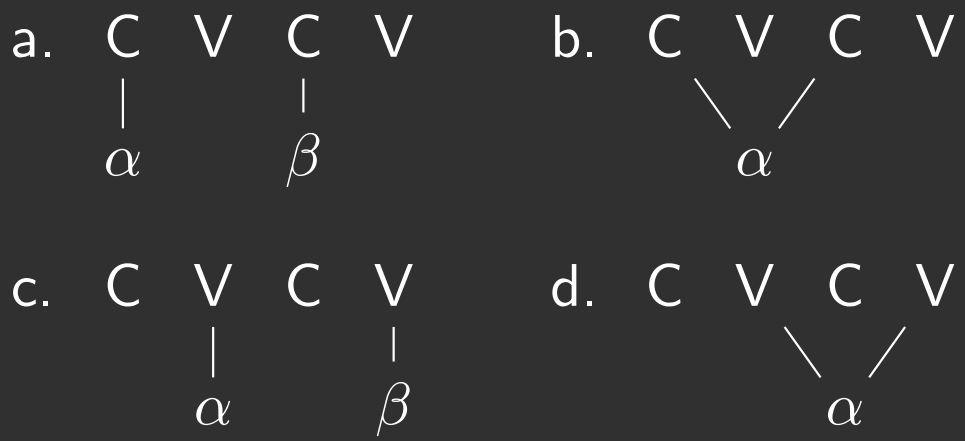

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- EN must be governed by a following non-empty N (a. *vs* b.)
- Final EN (FEN) must be parametrically licensed
  - ON: FEN can stay empty (b., d. *vs* c.)
  - OFF: FEN must be pronounced (epenthesis, c.)
- FEN can be further parametrically licensed to properly govern
  - ON: FEN can properly govern a preceding EN (d.)
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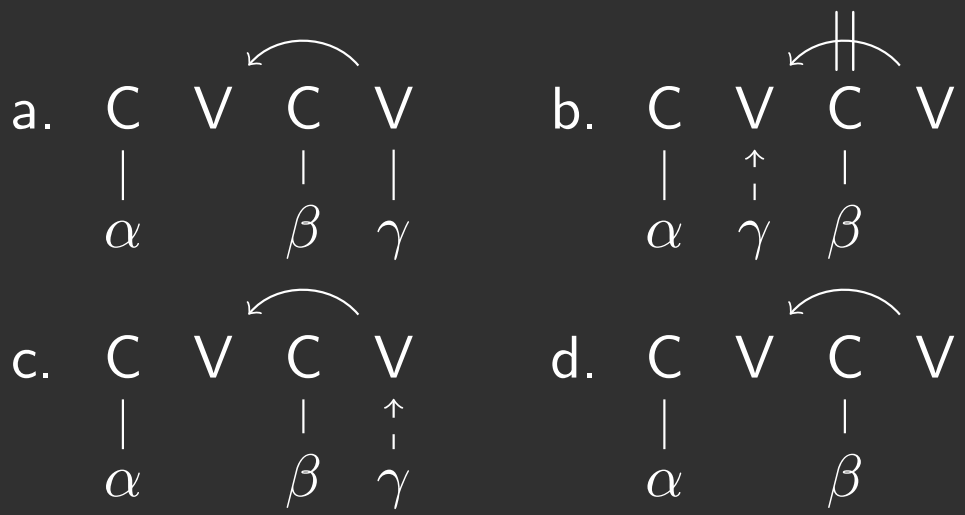

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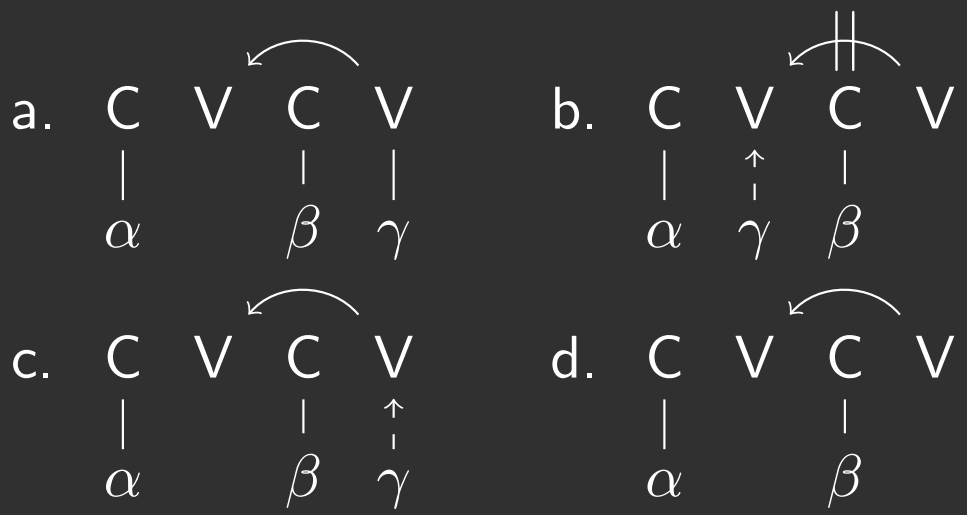

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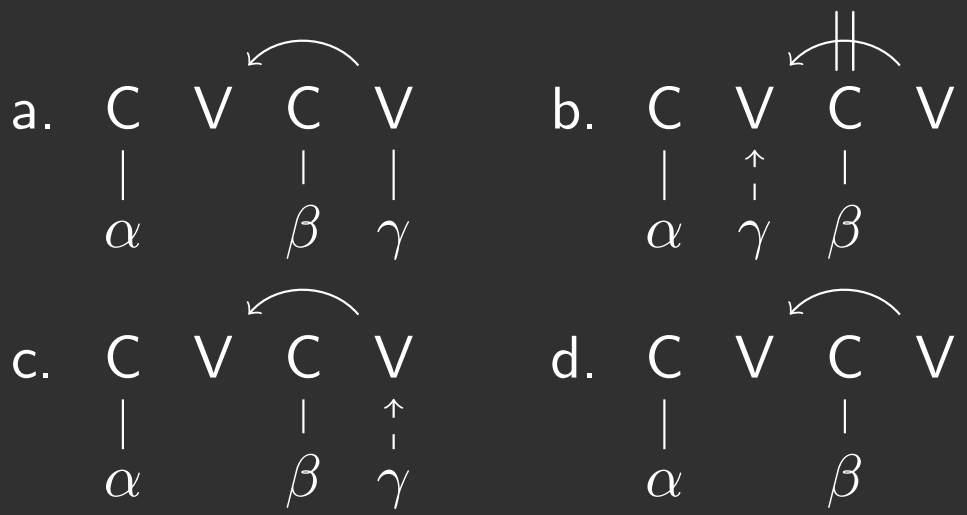
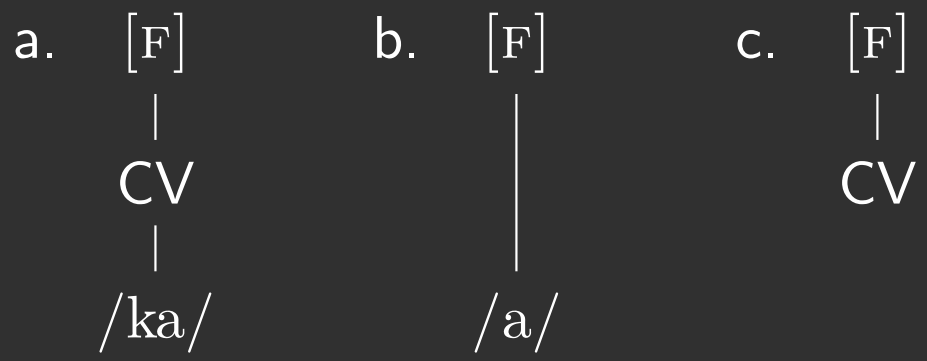


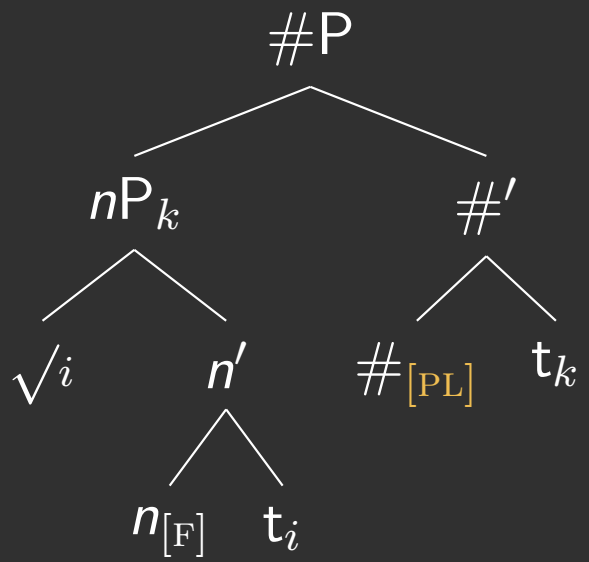
Morpheme templates (Bendjaballah & Heiden 2008)



- a. Regular marker: always audible
- b. Floating marker: audible if associated to a CV slot
- c. Empty CV marker: audible if hosting some melodic prime

Phonological account

- Spec-to-Spec roll-up movement



Phonological account - Sp. $\sqrt{\text{LOB}}$-a_{F}-s_{PL}

- Spec-to-Spec roll-up mov. $[[\sqrt{\text{LOB}}\ [n_{\text{F}}]]\ \#_{\text{PL}}]$
- $a \Leftrightarrow [\text{F}]$
- $\text{C}_s\text{V} \Leftrightarrow [\text{PL}]$
- Lampitelli (2014)

a. C V C V
l o b

b. C V C V
l o b + a

c. C V C V + C V
l o b a s

d. C V C V C V
l o b a s

Phonological account - It. $\sqrt{\text{LUP}}$-$e_{\text{F.PL}}$

- Spec-to-Spec roll-up mov. $[[\sqrt{\text{LOB}}\ [n_{\text{F}}]]\ \#_{\text{PL}}]$
- *a* $\Leftrightarrow$ [F]
- *i* $\Leftrightarrow$ [PL]
- /a/ = |A|, /i/ = |I|
- |A.I| = /e/
- Passino (2009), Lampitelli (2010, 2014)

a.


b.


c.


d.


Phonological account - Col. $\sqrt{\text{LUP}}$-i_{PL}-a_{PL}

- Spec-to-Spec roll-up mov. $[[\sqrt{\text{LOB}}\ [n_{\text{F}}]]\ \#_{\text{PL}}]$
- $\text{CV}_a \Leftrightarrow [\text{F}]$
- $_i \Leftrightarrow [\text{PL}]$
- $^*\text{V}_{|\text{X.Y}|}$: unstressed V cannot bear complex melodic structure (Cavirani 2015, Cavirani and Hamann 2022)

a.


b.


c.


d.


Phonological account

- Spanish
  - $_a \Leftrightarrow [\mathrm{F}]$
  - $\mathrm{C}_s\mathrm{V} \Leftrightarrow [\mathrm{PL}]$
- Colonnatese
  - $\mathrm{CV}_a \Leftrightarrow [\mathrm{F}]$
  - $_i \Leftrightarrow [\mathrm{PL}]$
- Italian
  - $_a \Leftrightarrow [\mathrm{F}]$
  - $_i \Leftrightarrow [\mathrm{PL}]$

Phonological account

- Uniform morphosyntactic derivation
- No postsyntactic operation
  - "syntax should be purged of any internal devices replicating the effects of other devices independently needed at PF or LF" (Brody 1995, 1997)
- Morpheme linear ordering managed by phonology
  - "linear order is a property of the SM interface" (Dobashi 2020)

Inflectional markers in Egyptian Arabic

The puzzle

1PL	*lebesna*
1SG	*lebest*
3F.SG	*lebset*

Excerpt of PRF of $\sqrt{\text{LBS}}$ 'put (clothes) on' (Fathi 2013)

- CeCC
  - 1PL: ...*besn*...
  - 1SG: ...*best*
- CCeC
  - 3F.SG: ...*bset*

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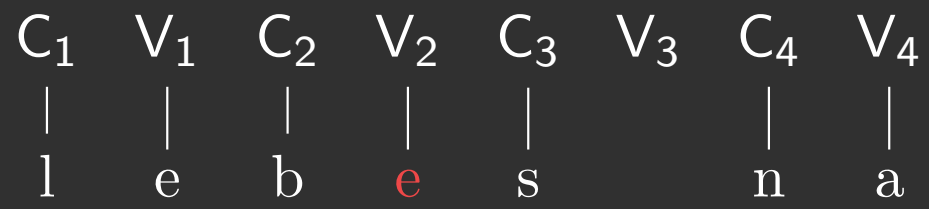

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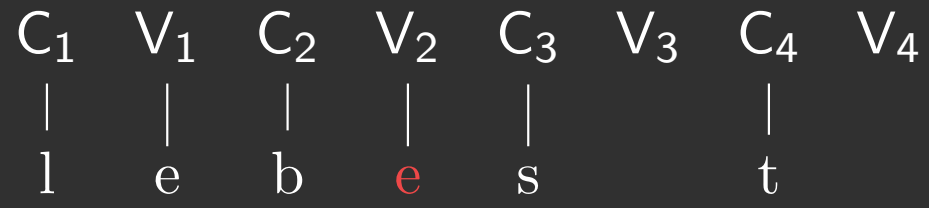
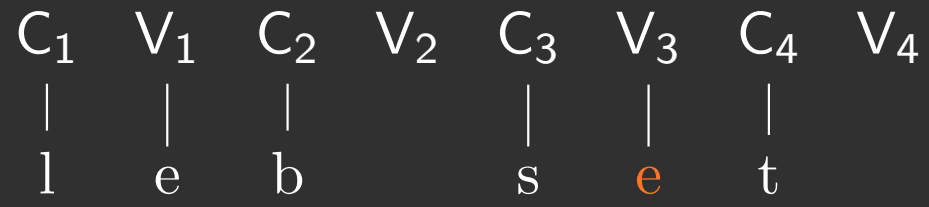


- 3F.SG: *lebset*



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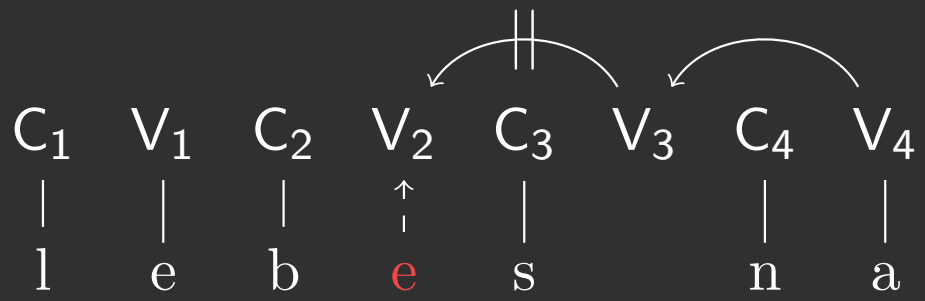
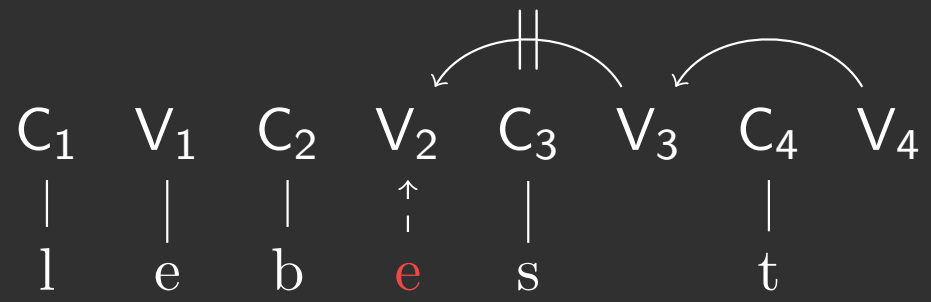
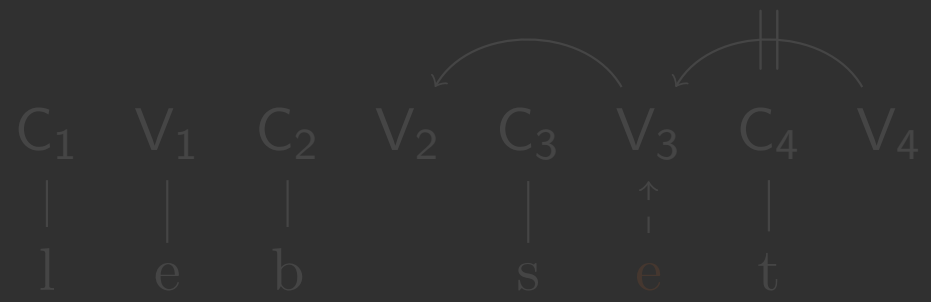


The puzzle

- 1SG: *lebest*
  - V_4 governs V_3 → **FEN parameter ON**



- 3F.SG: *lebset*
  - V_4 does not govern V_3 → **FEN parameter OFF**



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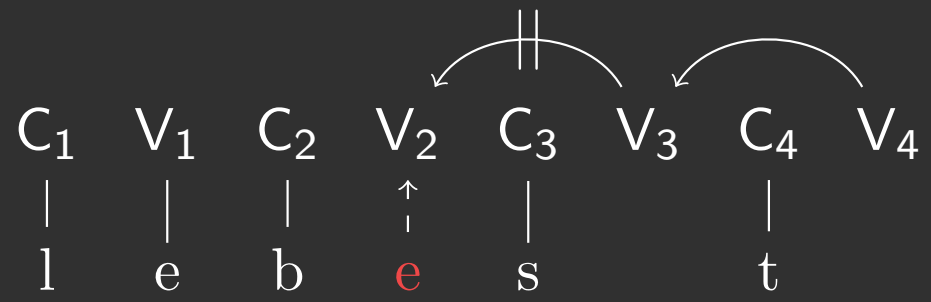

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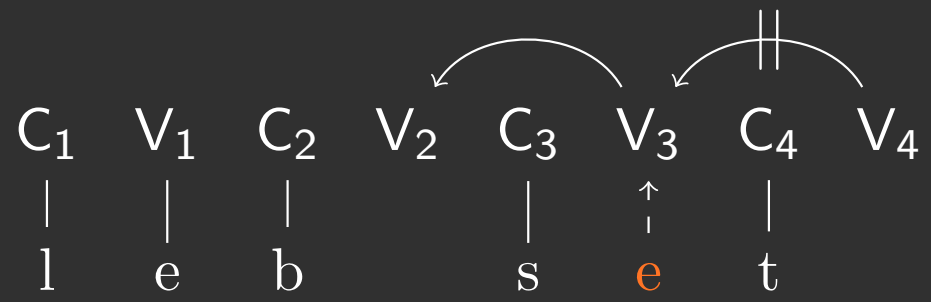

The puzzle

- Problem
  - FEN parameters are systemic
  - If FEN governs in 1SG, then it should in $3\text{F}.\text{SG}$ too
  - Scheer (2004): "At edges of morphemes, morphology (or syntax, or semantics) governs into phonological affairs and may outrank the domestic phonological rule: even though FEN are unpronounced, they may become good governors/licensors on a morphological order"
- Some questions
  - How to account for such cases of inconsistent FEN parametrization?
  - How to make a N laterally active despite being inaudible?
  - How can *morphological orders* be translated into phonological terms?

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  - How to make a N laterally active despite being inaudible?
  - How can *morphological orders* be translated into phonological terms?

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  - The silent final V of 1_{SG} and $1_{\text{F.SG}}$ are different objects
  - $3_{\text{F.SG}}$ has a FEN $\Rightarrow$ no government
  - 1_{SG} has a silent FN (FSN) $\Rightarrow$ government
- Technically
  - Formal distinction between phonological emptiness and silence
    - Phonological emptiness = absence of melodic primes
    - Silence = absence or underparsing of melodic primes
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Turbidity Theory (Goldrick 2001)

- OT-born input-output Containment relation
  - The input is always contained in the output
- Asymmetric relations between melodic primes and prosodic nodes
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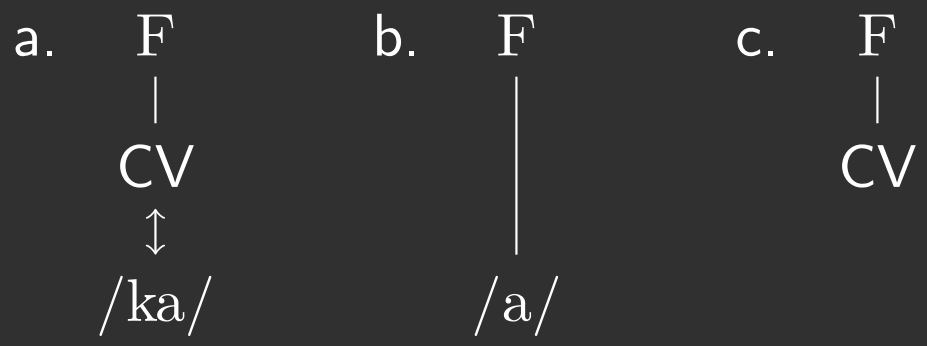
Morpheme templates



- a. Regular marker: always audible (↕)
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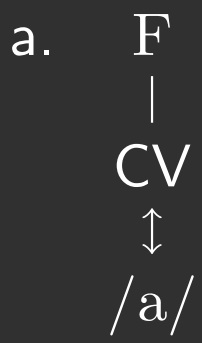
More morpheme templates

a. 

b. 

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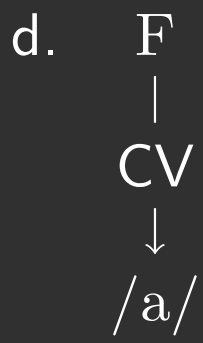
d. 

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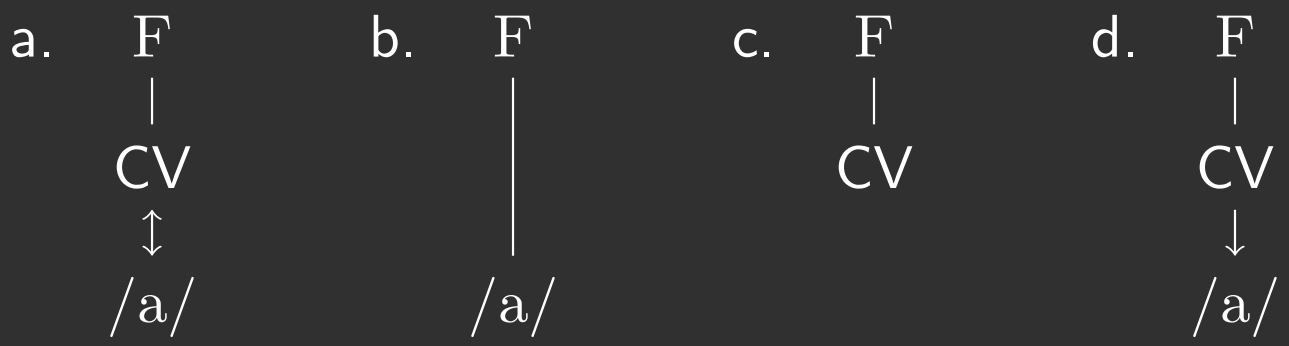
Turbidity Theory and the Complexity Condition



- Complexity Condition (Harris 1990)
  - Lateral strength $\propto$ representational complexity
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  - SN are more complex/laterally stronger than EN
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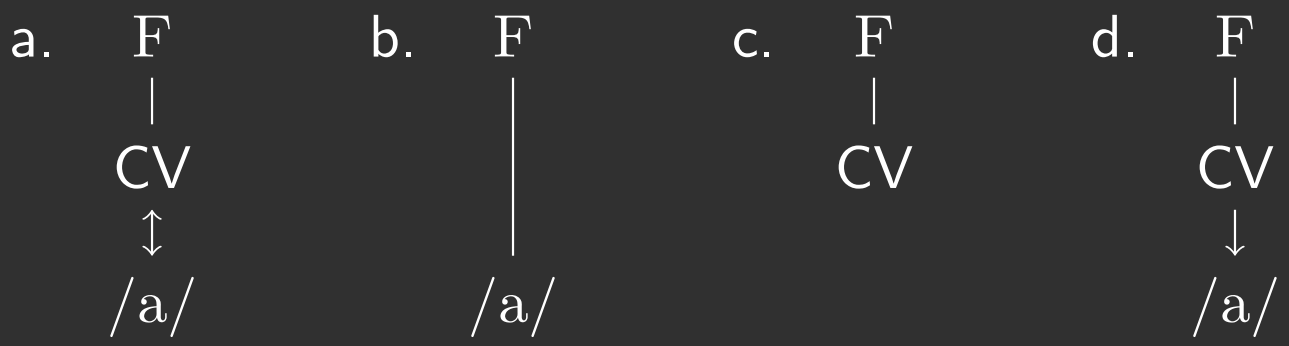

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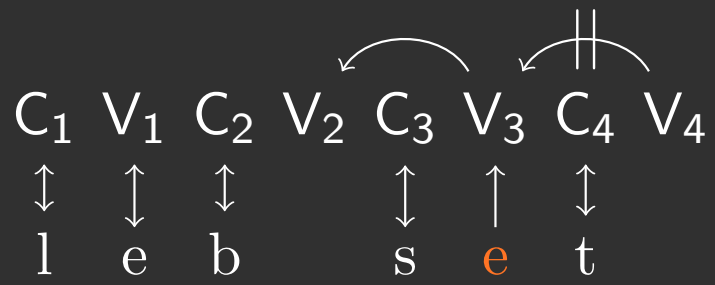
FEN *vs* FSN

- 3F.SG: /lebs-t/ → ['lebset]



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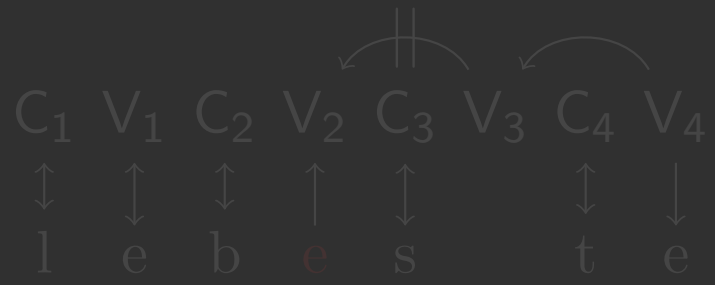

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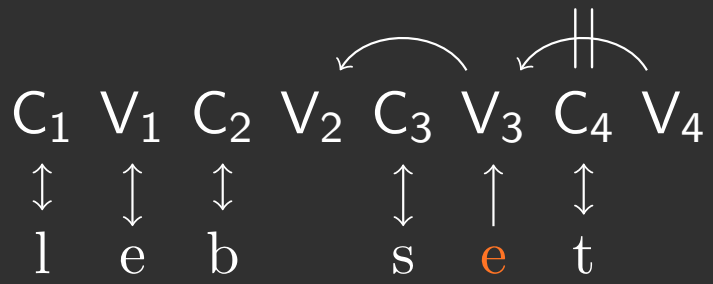

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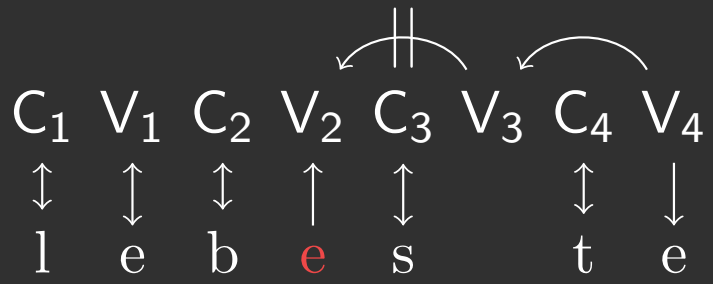

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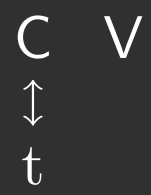

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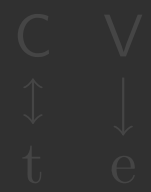

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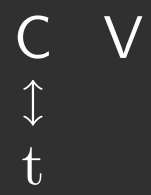

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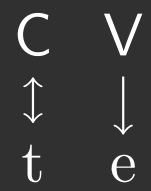

Interim conclusion

- Strict CV *cum* Turbidity Theory allows for
  - A neat formalization of silent phonologically active positions (the FSN of 1SG)
  - A neat account of patterns that are incompatible with a consistent use of FEN parameters
    - No need for the parameter regulating FEN activity
  - The translation into phonological terms of *morphological orders* impinging on FEN lateral strength

Stress and length in Egyptian Arabic

Distribution of stress and length

- Stress and length both in final and prefinal position
- Length-stress correlation (when V = corner vowel; see below)

a.	[mesekˈnaː]	CVCVCˈCVV
	‘we caught him’	
b.	[mesekˈnaːha]	CVCVCˈCVVCV
	‘we caught her’	
c.	[meseknaˈhaːli]	CVCVCCVˈCVVCV
	‘we caught her for me’	

Distribution of stress and length

- Length is contrastive only in final position

a.	[meˈsektu]	[mesekˈtuː]
	/mesek-tu/	/mesek-tu-u/
	caught-2PL.SBJ	caught-2PL.SBJ-3M.SG.OBJ
	‘you caught’	‘you caught it’
b.	[ˈkorsi]	[korˈsiː]
	/korsi/	/korsi-i/
	chair.SG	chair.SG-3M.SG.POSS
	‘chair’	‘his chair’

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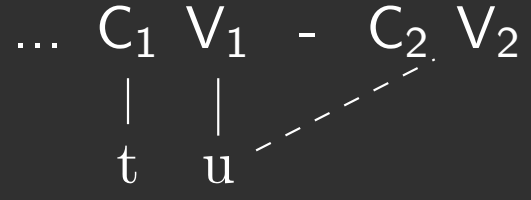

b. [korˈsiː]
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c. [mesekˈnaː]
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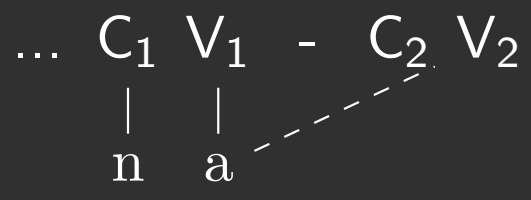

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- If these forms are followed by another suffix, [h] is followed by [u], and stress and length shift to the right (cf. [mesekˈtuː])

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- /u/ is visible to the stress assigning algorithm
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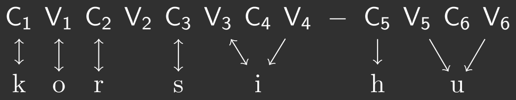

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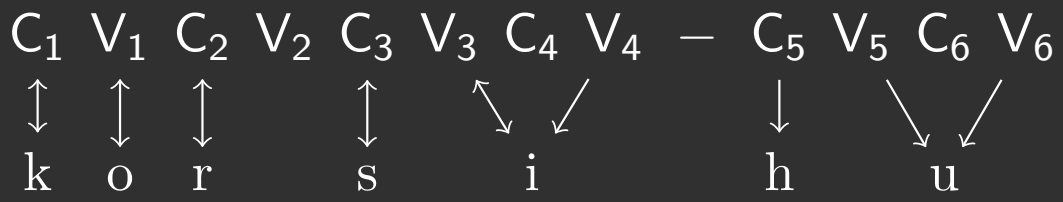
Stress, length, and Turbidity Theory



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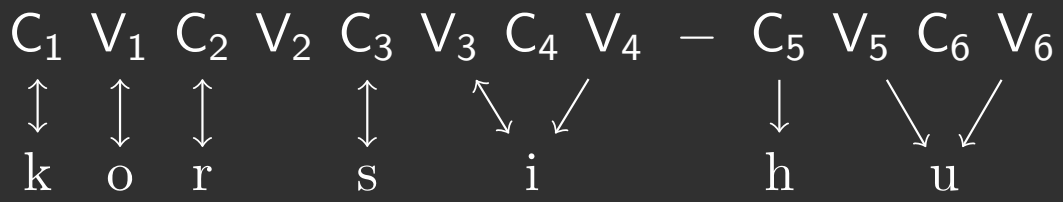

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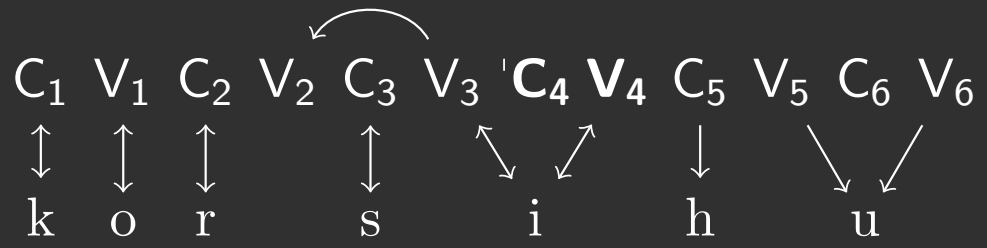

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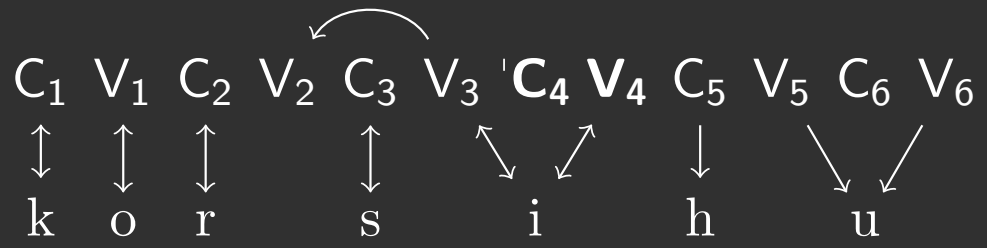

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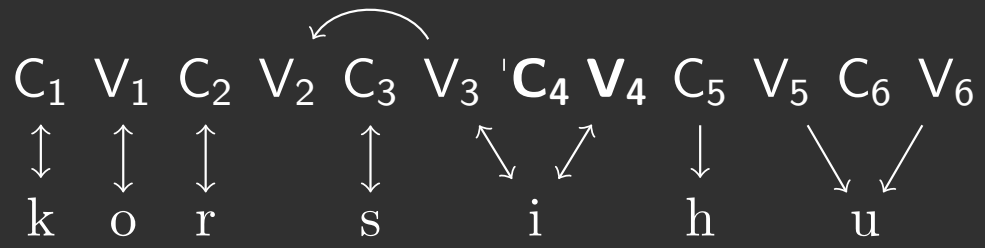

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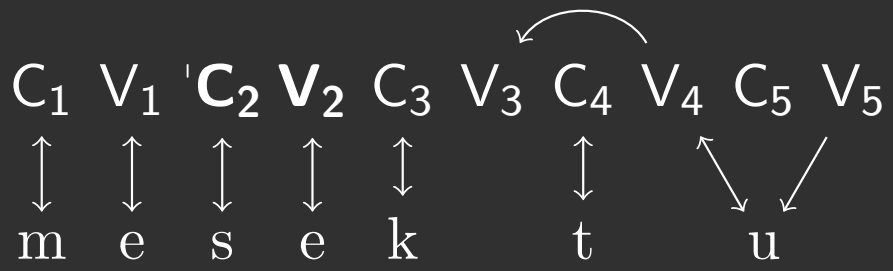
Surfacing of 3M.SG.OBJ

- /mesek-tuː/ ‘you caught’ → [meˈsektu]



- 2SG.SBJ = /tuː/
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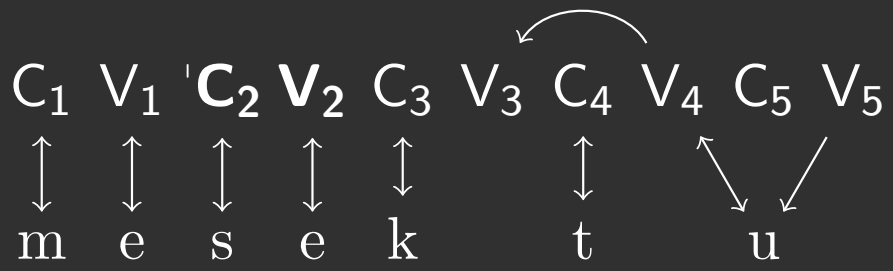

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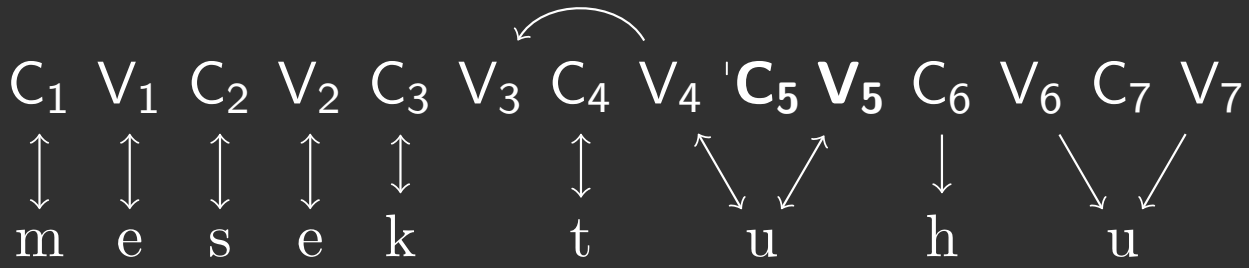
- /mesek-tuː-huː/ ‘you caught him’ → [mesekˈtuː]



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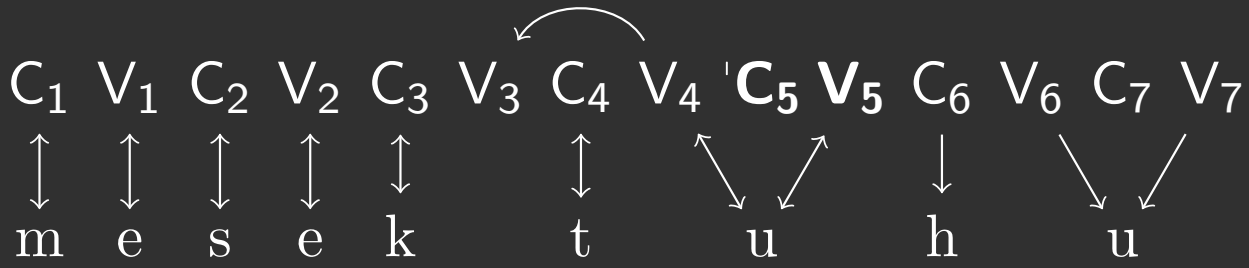

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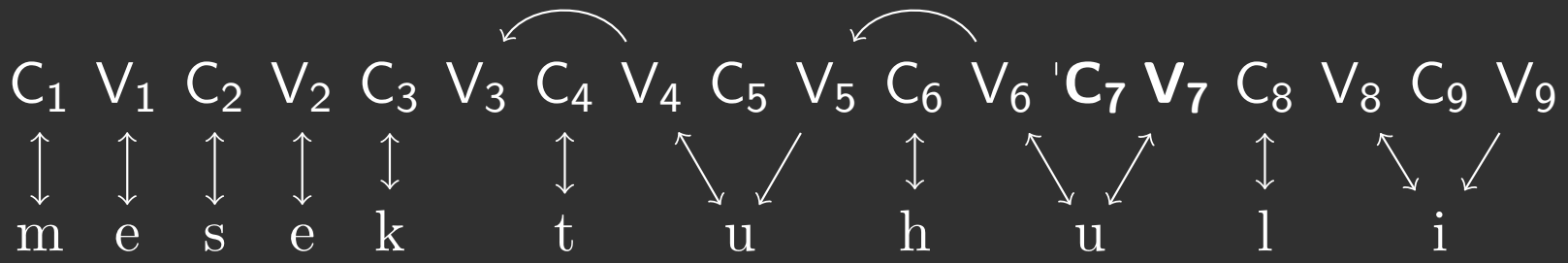

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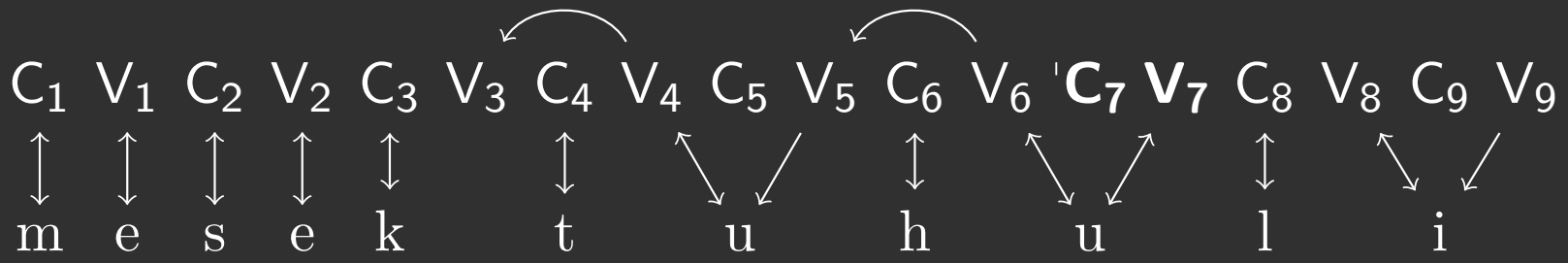

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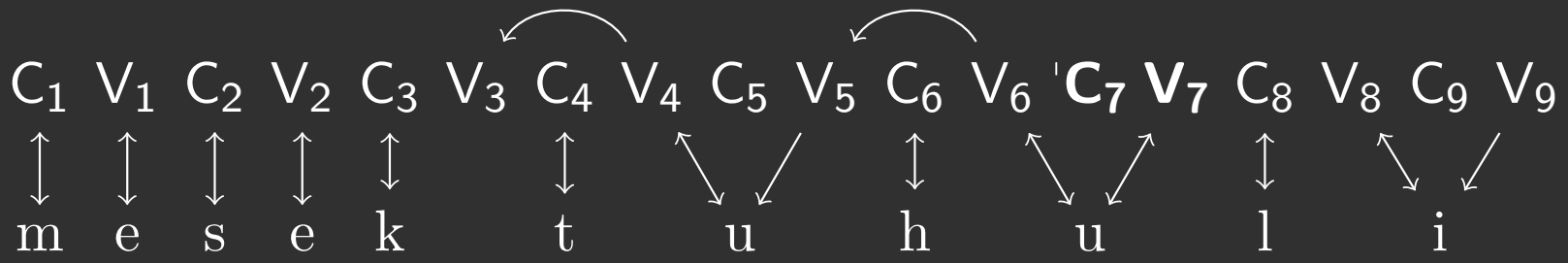

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Interim conclusion

- Turbidity Theory allows for a neat formalization of
  - Silent phonologically active objects (/huː/$_{\text{3M.SG.OBJ}}$)
  - The distribution of stress (always penultimate)
  - The correlation of stress and length in corner vowels

Conclusion

On the benefits of refined phonological representations

- Strict CV
  - Availability of ordered prosodic nodes (CV)
    - Marked linear ordering of Col. PL marker
- Strict CV *cum* Turbidity Theory
  - Phonological activity of silent objects
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- Architectural consequences
  - Reduced need for postsyntactic morphological operations
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    - PF operations as purely phonological
    - Direct morphosyntax-phonology mapping (Scheer 2011)
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Appendix

On *yers*

- Formally unclear status
  1. (F)EN can apparently distinguish EN from *yers*
     - FEN "can only govern nuclei that do not possess any floating melody in the lexicon" (Scheer 2004: 644)
  2. *Yers* = V + floating primes
  3. If primes are floating ⇒ no association with V
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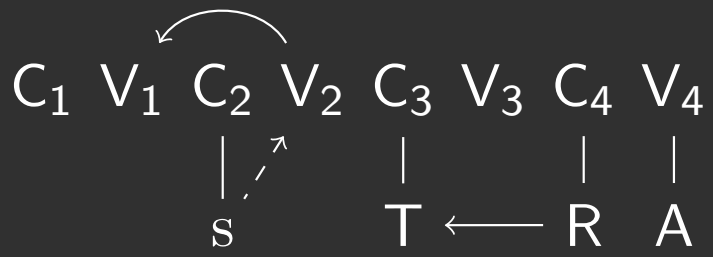
  - /s/ spreads to the EN between 'its' C and the following C (Carvalho 2017; Prince & Ferré 2020; Scheer & Segeral 2020)



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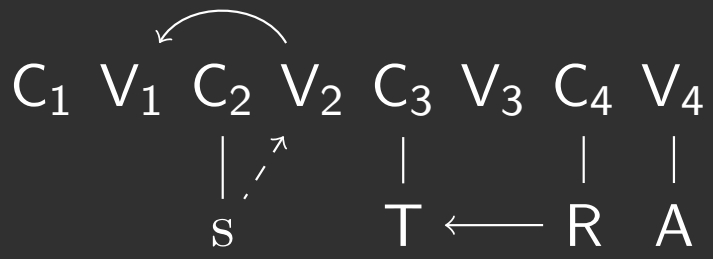

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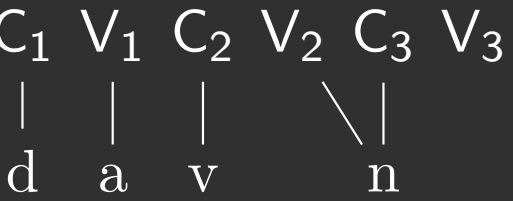

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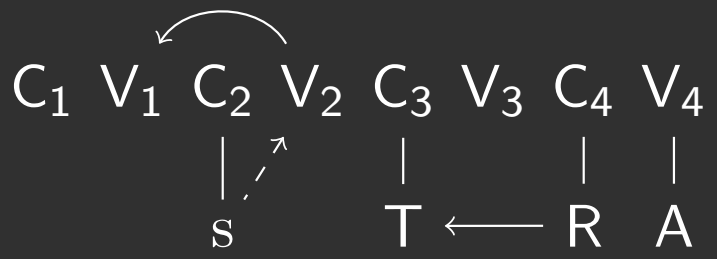

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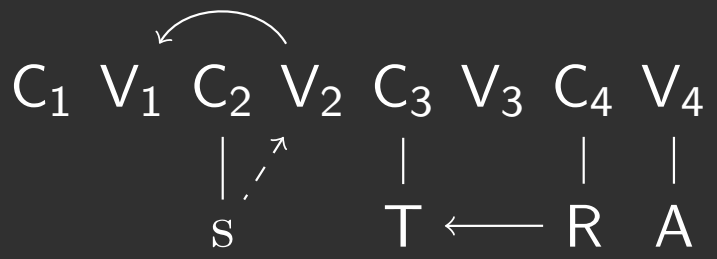

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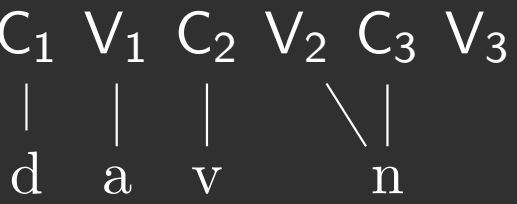

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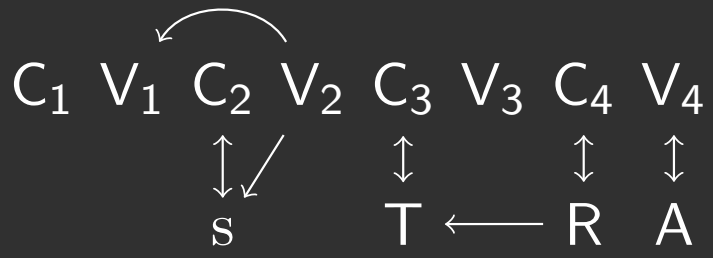

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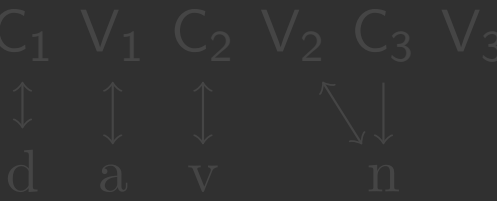

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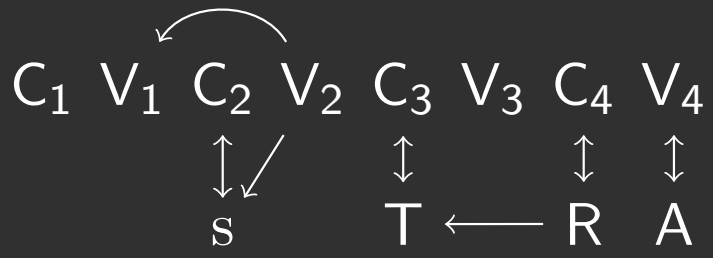

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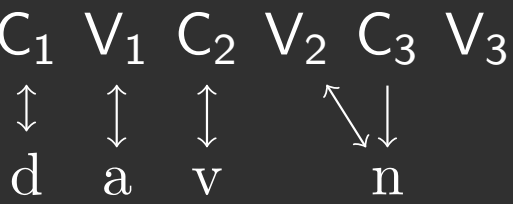

EA - Discarding alternatives

- /lebs/-/t/$_{\text{1SG}}$ $\rightarrow$ [leˈbest] $\Rightarrow$ FEN parameter ON
- /lebs/-/t/$_{\text{3F.SG}}$ $\rightarrow$ [ˈlebset] $\Rightarrow$ FEN parameter OFF

What if the $_{\text{3F.SG}}$ marker were different?

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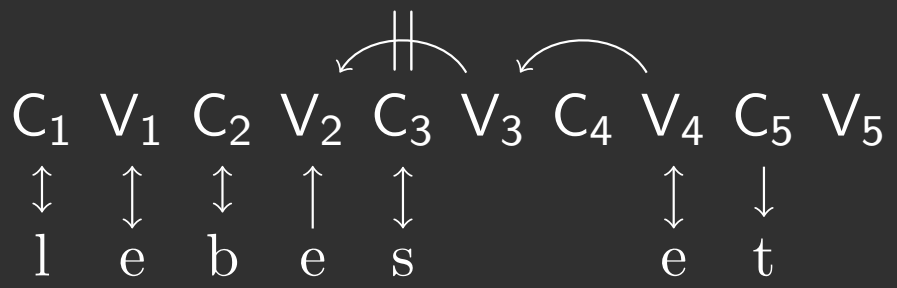
  - /lebs-et/ $\rightarrow$ *[leˈbeset]
    - Possible way-out (?): removal of V_3-C_4 (Gussmann & Kaye 1993)



EA - Discarding alternatives - II

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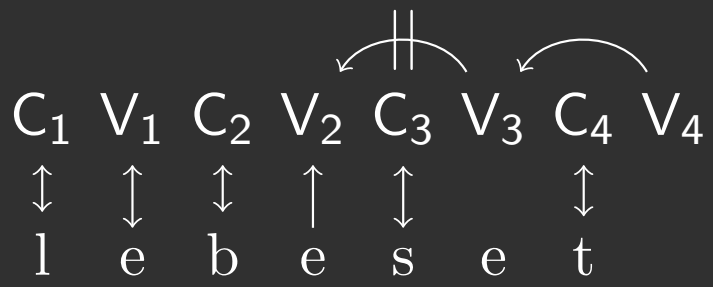

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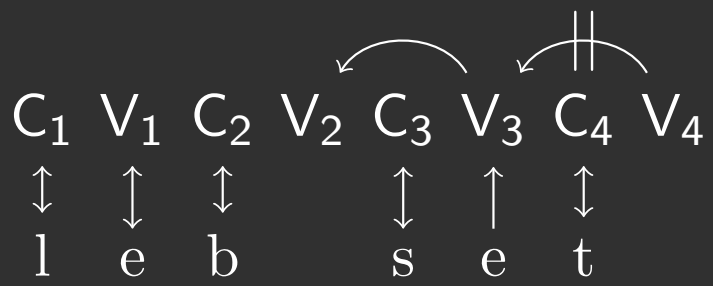

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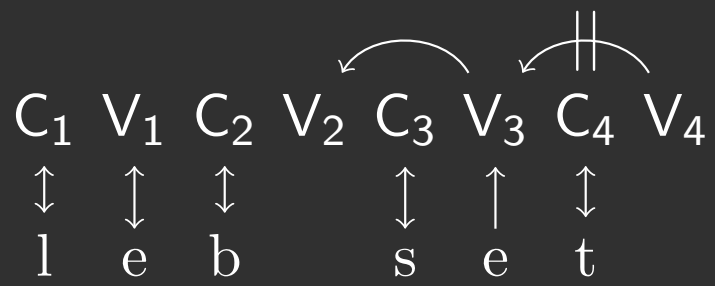

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