

# Turbid strict CV

## Silent lateral actors in Arabic

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1PL	<i>lebesna</i>
1SG	<i>lebest</i>
3F.SG	<i>lebset</i>

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

- *e* between  $C_2$  and  $C_3$  iif followed by CC
  - 1PL: ...*esn*
  - 1SG: ...*est*
- No *e* if followed by a full V
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■ 1PL: *lebesna*

C <sub>1</sub>	V <sub>1</sub>	C <sub>2</sub>	V <sub>2</sub>	C <sub>3</sub>	V <sub>3</sub>	C <sub>4</sub>	V <sub>4</sub>
l	e	b	e	s		n	a

■ 1SG: *lebest*

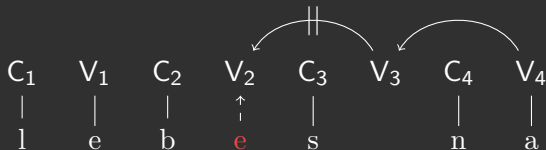
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l	e	b	e	s		t	

■ 3F.SG: *lebet*

C <sub>1</sub>	V <sub>1</sub>	C <sub>2</sub>	V <sub>2</sub>	C <sub>3</sub>	V <sub>3</sub>	C <sub>4</sub>	V <sub>4</sub>
l	e	b		s	e	t	

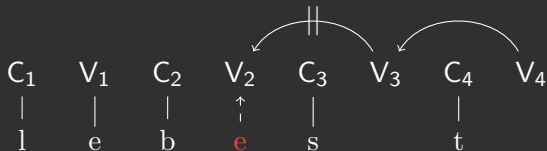
■ 1PL: *lebesna*

- $V_4 = \text{full N}, V_4 \text{ PGs } V_3 \Rightarrow V_3 = \emptyset$
- $V_3 \text{ is PGed} \Rightarrow V_3 \text{ *PGs } V_2 \Rightarrow V_2 = e$



■ 1SG: *lebest*

- $V_4 = \text{EN}$ ,  $V_4 \text{ PGs } V_3 \Rightarrow V_3 = \emptyset$ ,  $V_3 \text{ *PGs } V_2 \Rightarrow V_2 = e$
- FEN parameter **ON**



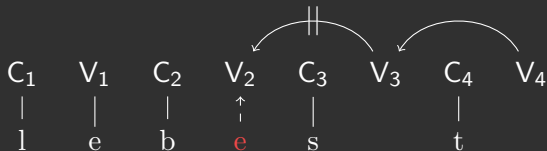
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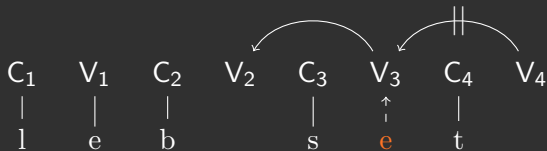
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## ■ Problem

- FEN parameters are systemic
- They hold throughout the whole grammar
- If FEN PGs in 1SG, then it should PG in 3F.SG too

## ■ Questions

- How to account for cases where FEN parameters do not work?
- Can we get rid of FEN parameter(s)?
- How to make a N laterally active despite not being pronounced?

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- Silence and phonological emptiness are not the same thing
- Silence can conceal phonological complexity
  - Not all (F)EN are the same/really empty

Upgrading strict CV with Turbidity Theory

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**Upgrading strict CV with Turbidity Theory**

# Structure of the talk

- 1 Strict CV *meets* Turbidity Theory
- 2 Case study I: Stress and length in CEA
- 3 Case study II: CEA inflectional markers
- 4 Extensions
- 5 Conclusion

# Strict CV *meets* Turbidity Theory

# Turbidity Theory (Goldrick 2001)

- OT-born input-output Containment relation
  - The input is always contained in the output
- Deletion as non-pronunciation of a UR prime
  - A prime 'belonging to' a C/V is not pronounced
- Epenthesis as pronunciation of an extra-UR prime
  - A prime 'not belonging to' the UR is pronounced on a C/V

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## ■ Reverse of deletion

### ■ Alternating V/yer

- A prime 'belonging to' a specific C/V is pronounced on that C/V if \*PGed

### ■ Pronunciation of floating primes

- A floating prime introduced by morphosyntactic computation is pronounced on a C/V

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## Asymmetric relations between primes and prosodic nodes

- **Projection** (↓)
  - Lexical affiliation of a prime to a C/V
  - No manipulation allowed
- **Pronunciation** (↑)
  - Phonetic interpretation of a prime on a C/V
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# Strict CV meets Turbidity Theory

Floating prime	EN	eN	Full N
	$V_1$	$V_2$	$V_3$
$ A $		$\downarrow$	$\updownarrow$
		$ A $	$ A $
$\emptyset$	$\emptyset$	$\emptyset$	$[a]$

- **Floating prime:** V-less prime
- **EN:** prime-less V
- **eN:** prime, V,  $\downarrow$  (= yers)
- **Full N:** prime, V,  $\downarrow$  and  $\uparrow$

# TT and the Complexity Condition

- Hypothesis I: Complexity Condition (Harris 1990)
  - “Let  $\alpha$  and  $\beta$  be melodic expressions occupying positions A and B respectively. Then, if A governs B,  $\beta$  is no more complex than  $\alpha$ ”
  - Lateral strength  $\propto$  representational complexity
- Hypothesis II
  - Representational complexity = number of representational primitives
  - Representational primitives = primes and relations ( $\downarrow$  and  $\uparrow$ )
- Some consequences
  - eN are more complex thus laterally stronger than EN
  - Some (F)EN are actually (F)eN
  - Silent N (eN) can be phonologically active

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# Two CEA puzzles

- Distribution of stress and length (case study I)
- Vocalization of the root-final V (case study II)
- Thoroughly discussed in Fathi (2013)
  - 'Informal' proposal of two silent objects
    - 3M.SG.OBJ/POSS /hu:/
    - 1SG.SBJ /tə/
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# Case study I: Stress and length in CEA



# Distribution of stress and length

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

- |    |   |                       |
|----|---|-----------------------|
| a. | [mesek'na:]<br>'we caught him'            | CVCVC' <b>CVV</b>     |
| b. | [mesek'na:ha]<br>'we caught her'          | CVCVC' <b>CVVCV</b>   |
| c. | [mesekna'ha:li]<br>'we caught her for me' | CVCVCCV' <b>CVVCV</b> |

# Distribution of stress and length

- Length is contrastive only in final position

a.	[me'sektu]	[mesek'tu:]
	/mesek-tu/	/mesek-tu-u/
	caught-2PL.SBJ	caught-2PL.SBJ-3M.SG.OBJ
	'you caught'	'you caught it'
b.	['korsi]	[kor'si:]
	/korsi/	/korsi-i/
	chair.SG	chair.SG-3M.SG.POSS
	'chair'	'his chair'

- Fathi (2013) shows that 'finality' is illusory
  - Concatenation of 3M.SG.OBJ  $\Rightarrow$  lengthening of the base-final vowel
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## 3M.SG.OBJ as empty CV

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/mesek-tu-u/  
caught-2PL.SBJ-3M.SG.OBJ  
'you caught it'
- |     |                |                |                |                |
|-----|----------------|----------------|----------------|----------------|
| ... | C <sub>1</sub> | V <sub>1</sub> | C <sub>2</sub> | V <sub>2</sub> |
|     |                |                | /              |                |
|     | t              | u              |                |                |
- b. [kor'si:]  
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- |     |                |                |                |                |
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|     |                |                | /              |                |
|     | s              | i              |                |                |
- c. [mesek'na:]  
/mesek-na-a/  
caught-1PL.SBJ-3M.SG.OBJ  
'we caught him'
- |     |                |                |                |                |
|-----|----------------|----------------|----------------|----------------|
| ... | C <sub>1</sub> | V <sub>1</sub> | C <sub>2</sub> | V <sub>2</sub> |
|     |                |                | /              |                |
|     | n              | a              |                |                |

## 3M.SG.OBJ as empty CV?

- Depending on “personal stylistic factors or contextual factors like slow speech or rhetorical emphasis” (Fathi 2013:18), these forms can be followed by [h]
  - [mesek'tu:] ~ [mesek'tu:h]
  - [kor'si:] ~ [kor'si:h]
- If these forms are followed by another suffix, [h] is followed by [u], and stress and length shift to the right (cf. [mesek'tu:])

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- 3M.SG.OBJ  $\neq$  empty CV
- 3M.SG.OBJ = CV
  - C = /h/
  - V = /u/
- /h/ and /u/ are **not necessarily pronounced**
- /u/ is **visible** to the stress assigning algorithm
  - Stress to the penultimate prime associated with a V

/hu/ is phonologically active, despite being silent

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# Representing 3M.SG.OBJ - provisional

- 3M.SG.OBJ enters the derivation with only ↓
- Its pronunciation (↑) depends on the phonological environment

C <sub>1</sub>	V <sub>1</sub>
↓	↓
h	u

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- CEA corner vowels are **phonetically** long is stressed
  - When a corner vowel “is identified as the stress bearing unit, pitch floods over its corresponding templatic chunk (that is two V slots), thus perceived ‘longer’ than usual” (Fathi 2013: 198)
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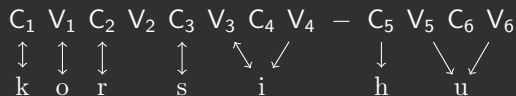
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  - Prime associated with both V via  $\downarrow$ , but only with one V via  $\uparrow$
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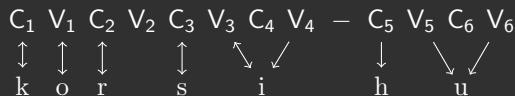
- V<sub>3</sub>, V<sub>4</sub> ↓ /i/ ⇒ phonologically long /i:/
- /i/ ↑ V<sub>3</sub> ⇒ phonetically short [i]

### 2. /hu:/ '3M.SG.POSS'

- V<sub>5</sub>, V<sub>6</sub> ↓ /u/ ⇒ phonologically long /u:/
- C<sub>5</sub> ↓ /h/
- no ↑ ⇒ phonetically silent marker

NB /u:/ final ⇒ /i:/ penultimate

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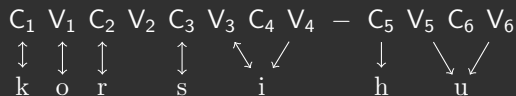
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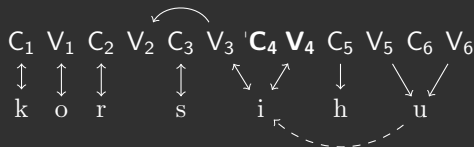
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# Stress and length

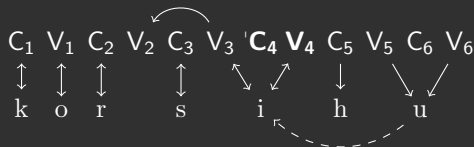


## ■ Phonological computation

- Stress to /i/ (penultimate associated prime)
  - /i/-to-V<sub>4</sub> ↑ insertion (length licensing)
    - /i:/ → [i:]
  - V<sub>3</sub> PGs V<sub>2</sub> ⇒ V<sub>2</sub> = ∅
  - /hu:/ unstressed ⇒ no ↑ ⇒ ∅
  - V<sub>5</sub> ('s /u/) licenses V<sub>4</sub> ('s /i/)



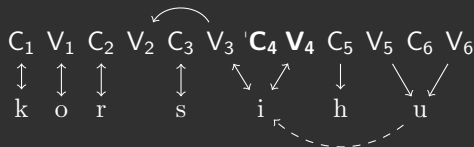
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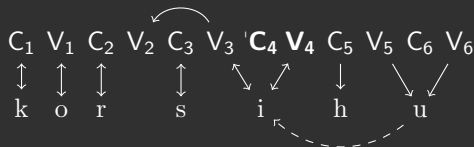
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- Stress to /i/ (penultimate associated prime)
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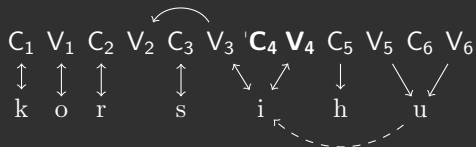
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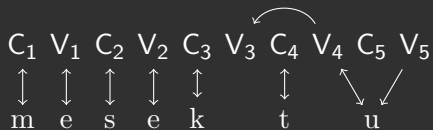


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# Surfacing of 3M.SG.OBJ

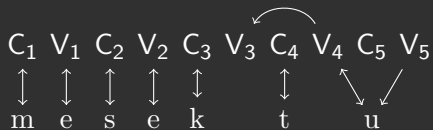
- /mesek-tu:/ 'you caught' → [me'sektu]



- $u$  = corner vowel  $\Rightarrow$  2SG.SBJ = /tu:/
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# Surfacing of 3M.SG.OBJ

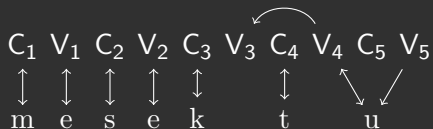
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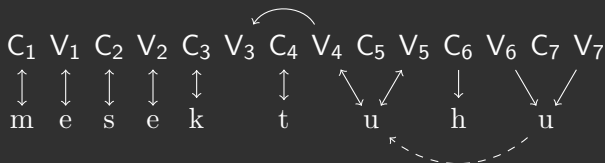
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# Surfacing of 3M.SG.OBJ

- /mesek-tu:-hu:/ 'you caught him' → [mesek'tu:]

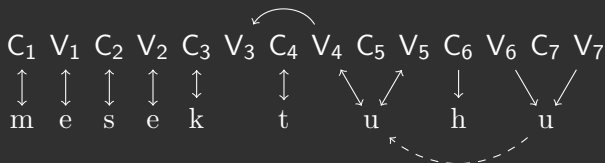


- Stress on 2SG.SBJ's /u:/ ⇒ /u/-to-V<sub>5</sub> ↑ insertion
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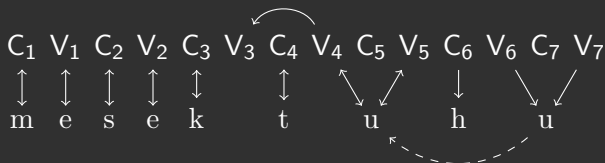
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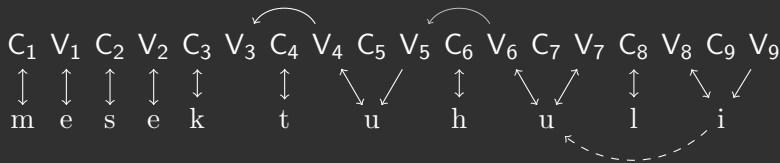
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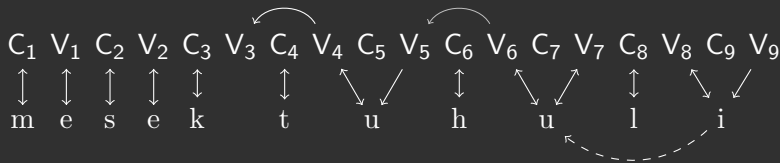
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  - V<sub>6</sub> PGs V<sub>5</sub>?
- No stress on 1SG.DAT /i:~ / ⇒ no /i/-to-V<sub>9</sub> ↑ ⇒ /i:~ / → [i]

# Surfacing of 3M.SG.OBJ

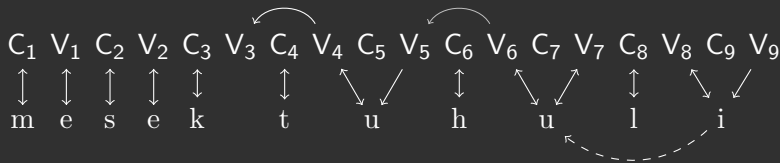
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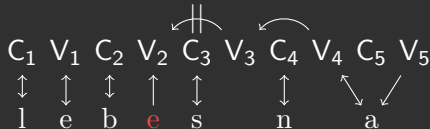
# Interim conclusion

- TT allows for a neat formalization of
  - Silent phonologically active objects (/hu:/<sub>3M.SG.OBJ</sub>)
  - The distribution of stress (always penultimate)
  - The correlation of stress and length in corner vowels

## Case study II: CEA inflectional markers

## Basic patterns and TT - provisional analysis

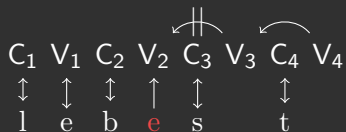
- 1PL: /lebs-na:/ → [le'besna]
  - $V_4 = \text{full N}, V_4 \text{ PGs } V_3 \Rightarrow V_3 = \emptyset$
  - $V_3 \text{ is PGed} \Rightarrow V_3 \text{ *PGs } V_2 \Rightarrow V_2 = [e]$



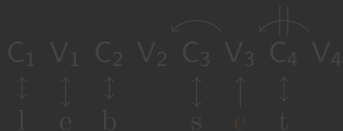


# Basic patterns and TT - provisional analysis

- 1SG: /lebs-t/ → [le'best]
  - $V_4 = \text{EN}$ ,  $V_4$  PGs  $V_3 \Rightarrow V_3 = \emptyset$ ,  $V_3$  \*PGs  $V_2 \Rightarrow V_2 = [e]$
  - FEN parameter **ON**

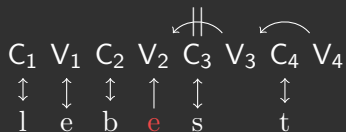


- 3F.SG: /lebs-t/ → [lebset]
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  - FEN parameter **OFF**

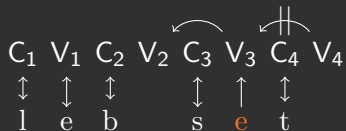


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- 3F.SG: /lebs-t/ → ['lebsət]
  - $V_4 = \text{EN}$ ,  $V_4$  \*PGs  $V_3 \Rightarrow V_3 = [e]$ ,  $V_3$  PGs  $V_2 \Rightarrow V_2 = \emptyset$
  - **FEN parameter OFF**



# Basic patterns and TT - provisional analysis

## ■ Problem

- FEN parameters are systemic
- They hold throughout the whole grammar
- If FEN PGs in 1SG, then it should PG in 3F.SG too

## ■ Solution

- The silent final V of 1SG and 1F.SG are different objects
- 1F.SG has a FEN ⇒ no PG
- 1SG has a FeN ⇒ PG

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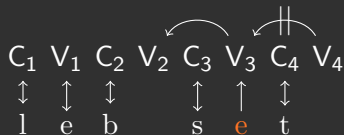
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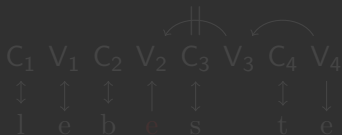
- The silent final V of 1SG and 1F.SG are different objects
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## FEN vs FeN

- 3F.SG: /lebs-t/ → [ˈlebsət]
  - $V_4 = \text{EN}$ ,  $V_4$  \*PGs  $V_3$
  - FEN parameter OFF

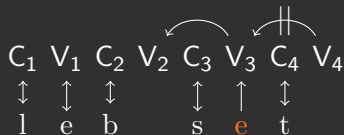


- 1SG: /lebs-t/ → [leˈbest]
  - $V_4 = \text{eN}$  ⇒  $V_4$  more complex than  $V_3$  ⇒  $V_4$  PGs  $V_3$
  - FEN parameter OFF, but irrelevant
  - Stress on [e] because penultimate

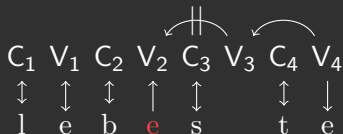


## FEN vs FeN

- 3F.SG: /lebs-t/ → [ˈlebsət]
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- 1SG: /lebs-t/ → [leˈbest]
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# FEN vs FeN

- 3G.SG marker:  $V = EN$ 
  - FEN parameter ON  $\Rightarrow$  PG
  - **FEN parameter OFF  $\Rightarrow$  \*PG**
  - **V invisible to stress algorithm**

C V  
 $\updownarrow$   
 t

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 t e



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↑	
↓	
t	

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# Discarding alternatives

- 1SG /lebs-t/ → [le'best] ⇒ FEN parameter ON
- 3F.SG /lebs-t/ → ['lebset] ⇒ FEN parameter OFF

What if the 3F.SG marker were different?

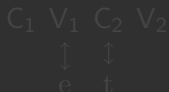
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What if the 3F.SG marker were different?

# Discarding alternatives - I

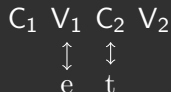
- 1SG /lebs-t/ → [le'best] ⇒ FEN parameter ON
- 3F.SG /lebs-et/ → ['lebset] ⇒ FEN parameter ON



- $V_1 = \text{full N} \Rightarrow V_2 \text{ *PGs } V_1 \Rightarrow$  no problems with FEN parameter ON

# Discarding alternatives - I

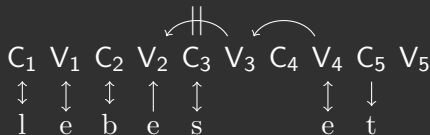
- 1SG /lebs-t/ → [le'best] ⇒ FEN parameter ON
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- V<sub>1</sub> = full N ⇒ V<sub>2</sub> \*PGs V<sub>1</sub> ⇒ no problems with FEN parameter ON

## Discarding alternatives - I

- 3F.SG /lebs-et/
  - $V_4$  PGs  $V_3 \Rightarrow V_3$  \*PGs  $V_2$
  - /lebs-et/  $\rightarrow$  \*[le'beset]
    - Possible way-out (?): removal of  $V_3$ - $C_4$  (Gussmann & Kaye 1993)



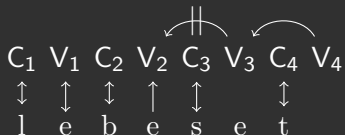
# Discarding alternatives - II

- 3F.SG /lebs-<sup>e</sup>t/
  - /e/ as floating prime

	C <sub>1</sub>	V <sub>1</sub>
	↕	
e		t

## Discarding alternatives - II

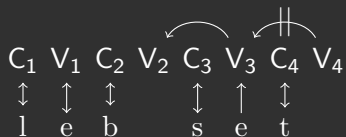
- 3F.SG /lebs-<sup>e</sup>t/ & FEN parameter ON
  - $V_4$  PGs  $V_3 \Rightarrow$  no floating prime integration  $\Rightarrow V_3$  \*PGs  $V_2$
  - /lebs-<sup>e</sup>t/  $\rightarrow$  \*['lebest]





## Discarding alternatives - II

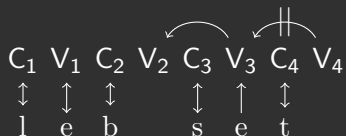
- 3F.SG /lebs-<sup>e</sup>t/ & FEN parameter OFF
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- This works iff FEN parameter is OFF and 1SG has a FeN (Fathi 2013)

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- This works iif FEN parameter is OFF and 1SG has a FeN (Fathi 2013)

# Interim conclusion

- TT allows for a neat formalization of
  - Silent phonologically active objects (the FeN of 1SG /t/)
  - The behaviour of final CC clusters not compatible with FEN parameters

# Extensions

# 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  $\Rightarrow$  no association with V
4. If V is not associated with any prime  $\Rightarrow$  V is empty
5. (F)EN should not distinguish *yers* from EN

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# On *yers*

- Unconstrained landing site of floating primes
  - If primes for V = primes for C (Element Theory), and
  - If *yer*'s V is PGeD
  - Floating primes of *yers* could associate with neighbouring C
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  - Floating primes of *yers* 'prefer' to associate with 'their' V
  - How to define 'ownership'? (see above)

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  - Floating primes of *yers* 'prefer' to associate with 'their' V
  - How to define 'ownership'? (see above)

# On *yers*

- No problem if *yers* = eN
  1. eN *project* a melodic prime  $\Rightarrow$  the prime is integrated in the phonological string
  2. EN can 'see' the prime  $\Rightarrow$  FEN can distinguish between EN and eN
  3. The melodic prime of a eN is pronounced on the prosodic node from which it is projected
    - Unless forced to be pronounced elsewhere (CA *transfer*; Bohas & Lowenstamm 2021, Cavirani 2022)

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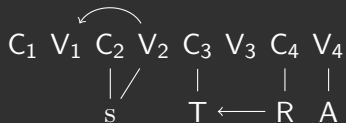
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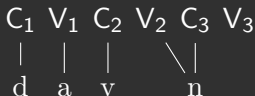


# On *magic* licensing/syllabic consonants

- Getting rid of *magic* licensing (*s*TRV)
  - /s/ fills in/spreads to the EN occurring between /s/ and C (Carvalho 2017; Prince & Ferré 2020; Scheer & Segéral 2020)



- Syllabicity of C
  - “Potentially-syllabic consonants /l,n/ must always be associated to a V-slot” (Faust 2022)

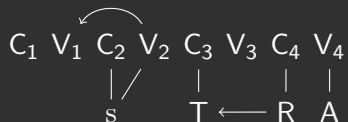


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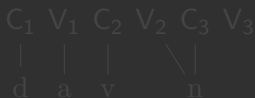
- Orthodox use
  - Representing length
    - C:= melodic prime associated to 2 C
    - V:= melodic prime associated to 2 V
  - Defining the phonetic interpretation
    - |A|, |I|, |U| in V = [ə], [i], [u]
    - |A|, |I|, |U| in V = [r], [j], [w]

# On *magic* licensing/syllabic consonants

- Heterodox use of association relations
  - /s/ surfaces as [s]  $\Rightarrow$  neither long nor syllabic

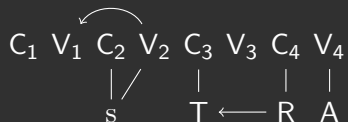


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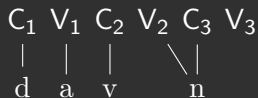


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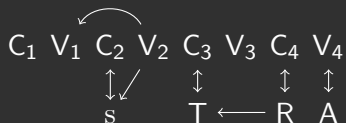
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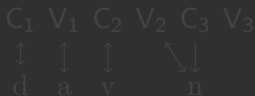
# On *magic* licensing/syllabic consonants

## ■ A coherent doxa

- /s/ is **projected** by C<sub>2</sub> and V<sub>2</sub> ⇒ /s/ 'is' both a C and a V
- /s/ is **pronounced** only in C<sub>2</sub> ⇒ /s/ surfaces as [s]



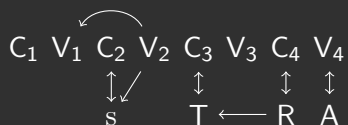
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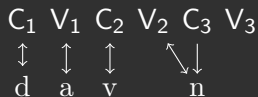
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# Conclusion

# Why upgrading strict CV with TT is a good idea

## ■ Specific

- Phonological activity of silent objects (/hu:/<sub>3M.SG.OBJ</sub>, /t/<sub>1SG</sub>'s FeN)
- Regularization of the distribution of stress (always penultimate)
- Formalization of the correlation of stress and length in corner vowels
- Regularization of the behaviour of final CC clusters not compatible with FEN parameters

## ■ General

- Improved formalization of *yers*
- Improved formalization of *magic* licensing and syllabic C configurations

## ■ Even more general

- Direct relation between lateral actorship and representational complexity
- Reducing the need for FEN parameters: lateral strength encoded in the Lexicon
- Accounting for *phonological traces* (not this talk, but you can ask)



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