Degema en(do)clisis and the syntax-prosody interface in LFG

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Thesis: The prosody-syntax interface in LFG

(Supervisors: Frans Plank and Tracy H. King)

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1. Introduction & background
2. Lexicon, p-diagram, and the prosody-syntax interface
   → *German case ambiguities*
3. Postlexical phonology and the syntax-prosody interface
   → *Swabian 1SgNom-pronoun alternation*
4. The string interface
   → *Degema en(do)clisis*
   → *Pashto second position and en(do)clisis*
5. Conclusion and future work

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- Problematic for the concept of Lexical Integrity
- Challenging from the view of Modularity

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This talk:

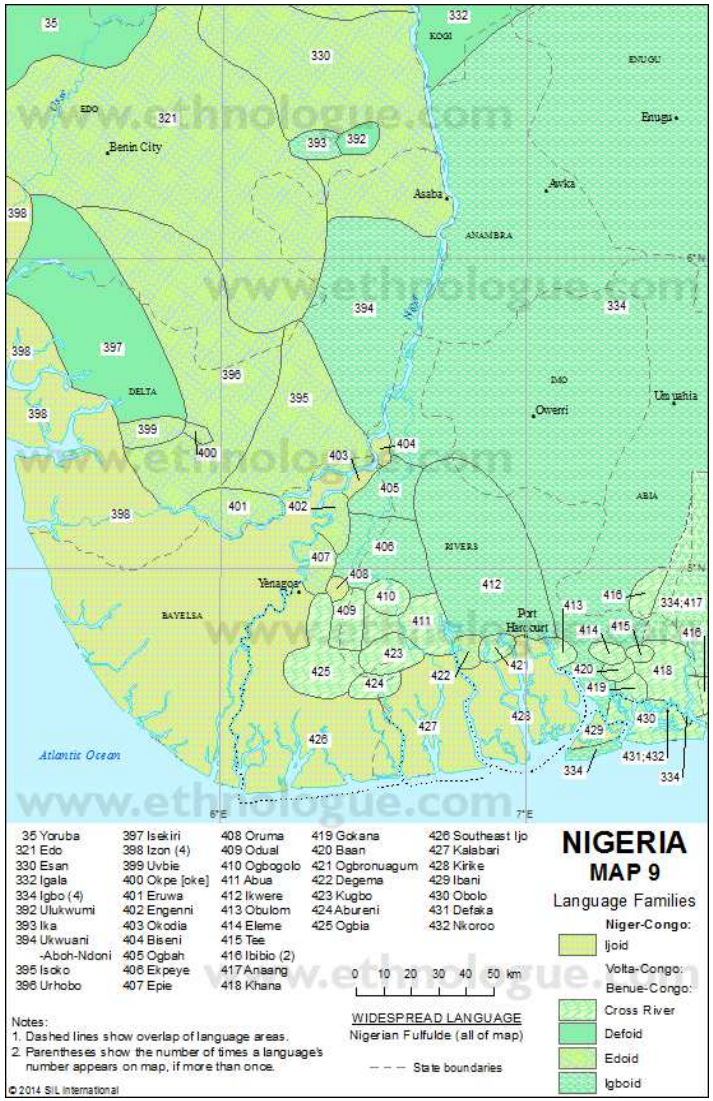
- Presents Degema endoclisis (Kari 2003)

→ New approach to the syntax-prosody interface in LFG

→ which results in a fundamental change of the architectural assumptions

Degema

- Delta-Edoid language
- Spoken in Rivers State region of Southern Nigeria
- No standard version, but two dialects: Usokun and Atala, spoken by ca. 11.000 speakers each
- Main focus of this paper: Usokun dialect



Degema - some basic facts

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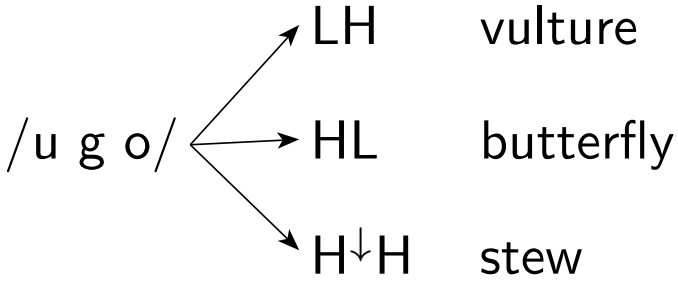
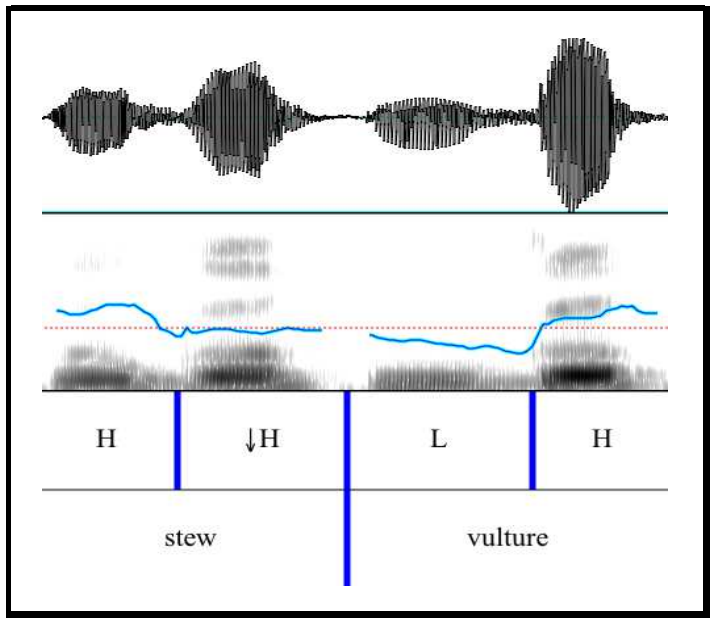


(UCLA Phonetics Lab Archive (2007))



Degema - the factative clitic

Degema has a number of en- and proclitics, one of them is the *factative clitic*.

> *... is used to denote a fact, which may be a dynamic situation that has already been completed or a state that once existed or still exists at the present time.*
>
> (Rose (2014), cf. Jenewari (1980, p.133))

- Consists of an underspecified vowel V, which copies features of vowel in host's last syllable, and *n*: Vn
- Host is either the verb or the object pronoun following the verb
- Realised *except* in questions, negative clauses, or if there is a clitic indicating future

→ Non-prosodic/phonological factors are left out here

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1. The phonological environment (consonant vs. vowel) of the host's last segment and (if present) the following word's first segment.
2. The structure surrounding it; more specifically: medial vs. final position in a clause (matrix and subordinate).

Clause-medial *en*clitic with preceding vowel

1. Phonological environment: **Vowel–Factative–Consonant (xxV =n Cxx)**

(1) Breno o=síré tạ́**=n** mụ́ éki
Breno 3Sg=run go**=FE** to market
'Breno ran to the market.' (Kari 2004, 114)

2. Phonological environment: **Vowel–Factative–Vowel (xxV =n Vxx)**

(2) Ení bọ́l-ám ójzí yọ i=dịyómósé**=n** ávom bạaw.
we hold-GER thief DEF 3Sg=sweeten**=FE** inside their
'It pleased them that we caught the thief.' (Kari 2004, 50)

Clause-medial *en*clitic with preceding consonant

3. Phonological environment: **Consonant–Factative–Vowel (xxC =n Vxx)**

(3) Ụ́buwan i=kél**=n** ụ́sóm yọ́
salt 3Sg=be more than**=FE** soup DEF
'Salt is more than the soup.' (Kari 2004, 153)

4. Phonological environment: **Consonant–Factative–Consonant (xxC ∅ Cxx)**

(4) Ẹ́=yáw mụ́ ínwíny ụ́tany
3Pl=take.**FE** from body tree
'They got it from a tree.' (Kari 2004, 200)

Clause-final position with preceding vowel

5. Phonological environment: **Vowel–Factative (xxV =Vn)**

(5) O=síré=$^{\downarrow}$**en**
3Sg=run=**FE**
'(S)he ran.' (Kari 2004, 72)

- In contrast to the clause-medial position, the underspecified vowel of the clitic is realised.

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- It copies the features of the host's last vowel
- and it is indicated via a downstep in tone.

Clause-final position with preceding consonant

6. Phonological environment: **Consonant–Factative (xxVVC) → endoclisis**

(6) O=bó=$^{\downarrow}$**o**=l
3Sg=hold$_1$**=FE**=hold$_2$
'(S)he held (a cloth).' (Kari 2004, 72)

Analysis according to Kari (2002, 2004, 2012)

- ból + Vn

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- The *n* is deleted: bó$^{\downarrow}$ol (avoid consonant clusters)

Clause-final position in matrix and subordinate clause

(7) *En*clitic
[Óhó nụ́ o=yí=↓**in**] mị=mésé=t↓e
time that 3Sg=come=**FE** 1Sg=sleep=PE
'I had slept when (s)he came.' (Kari 2004, 58)

(8) *Endo*clitic
[Fiwol ọ=kpérı ḅá=↓**a**=w] é=y↓i
PN 3Sg=tell them$_1$=**FE**=them$_2$ 3Pl=come
'Fiwol told them to come.' (Kari 2004, 108)

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→ Evidence from the definite marker *yo*:

(9) (mɪ=mɔ́n ówéj [nʊ́ baw e=kótú**=n**]$_{rel}$ yo)$_{IntP}$
1Sg=see person that they 3Pl=call=FE DEF
'I saw the person who they called.' (Kari, p.c.)

→ Realised as clause-medial, even though at the end of a syntactic phrase

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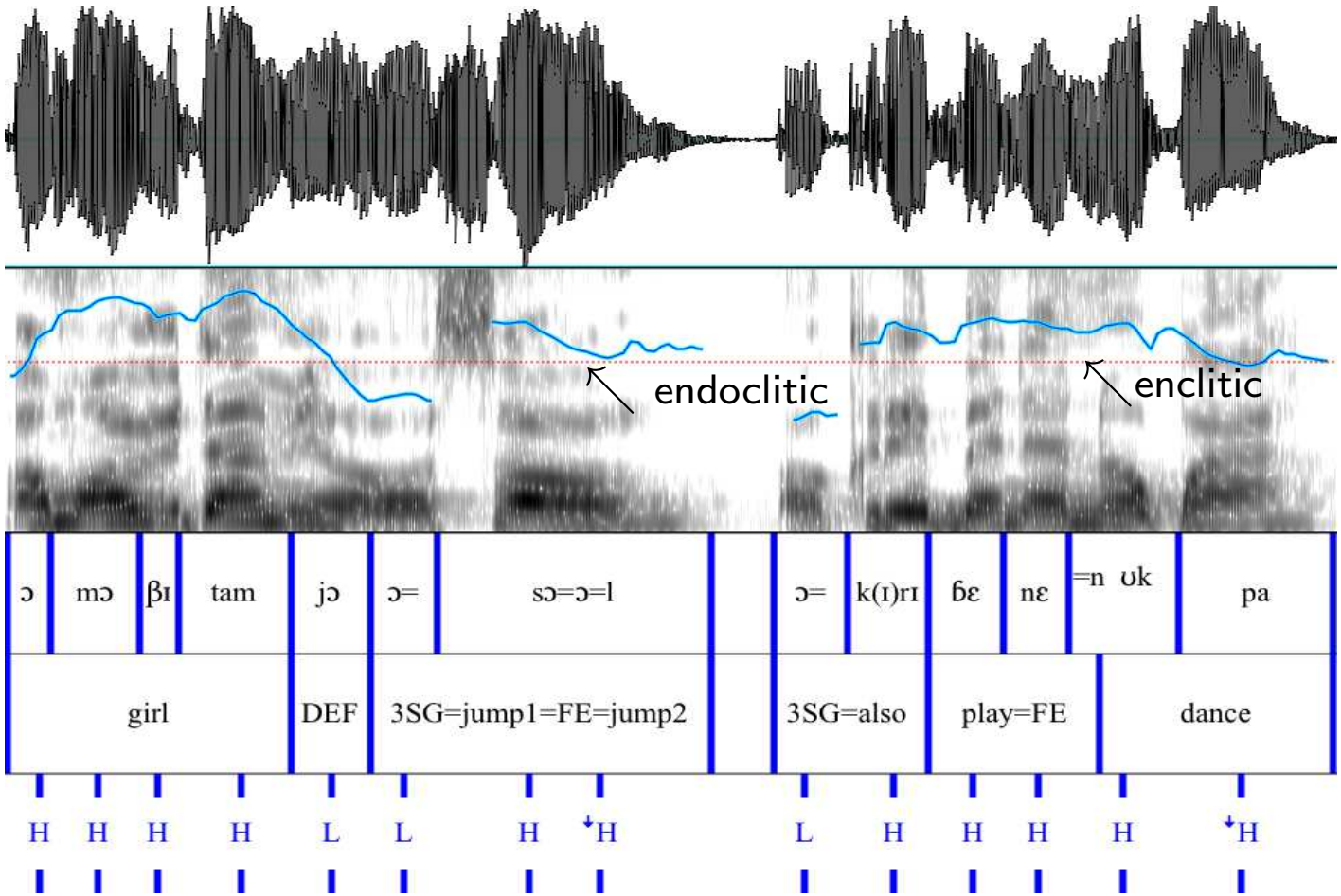
⇒ **Conclusion**: Prosodic phrasing triggers the clitic's realization

An example ...

(10) (ɔ́mɔ́ßítám yo ɔ=sɔ́=$^{\downarrow}$**ɔ**=l)$_{IntP}$ (ɔ=kírí bɛ́nɛ́=**n** ʊ́kp$^{\downarrow}$a)$_{IntP}$
girl DEF 3Sg=jump$_1$**=FE**=jump$_2$ 3Sg=also play**=FE** dance
'The girl jumped and danced.' (Kari, p.c.)



Factative Paradigm

phrase position	phonological environment
medial	xxV=**n** Cxxx
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factors relevant for the clitic's realisation:

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⇒ can be realised with **postlexical phonology**

LFG's Grammar architecture

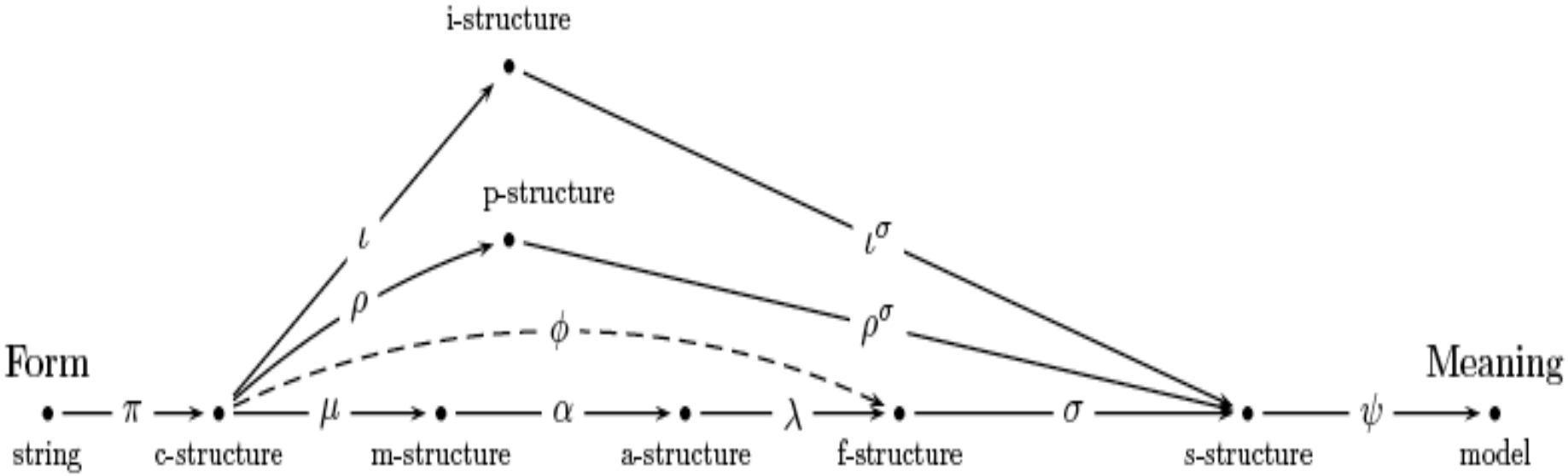

Figure: LFG's correspondence architecture (Asudeh 2006).

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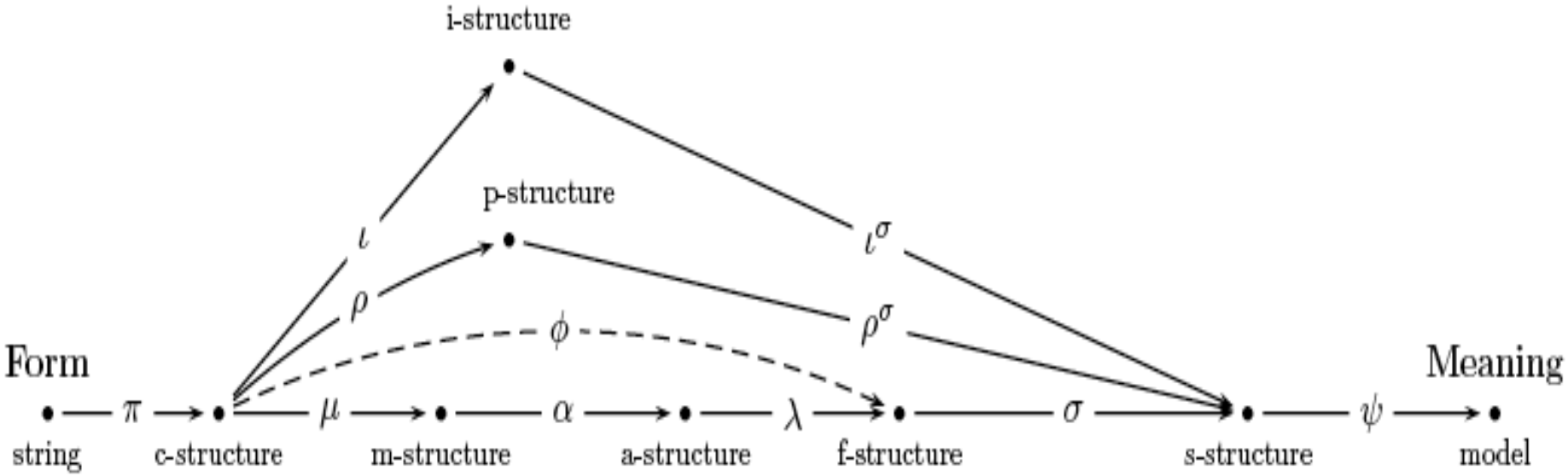

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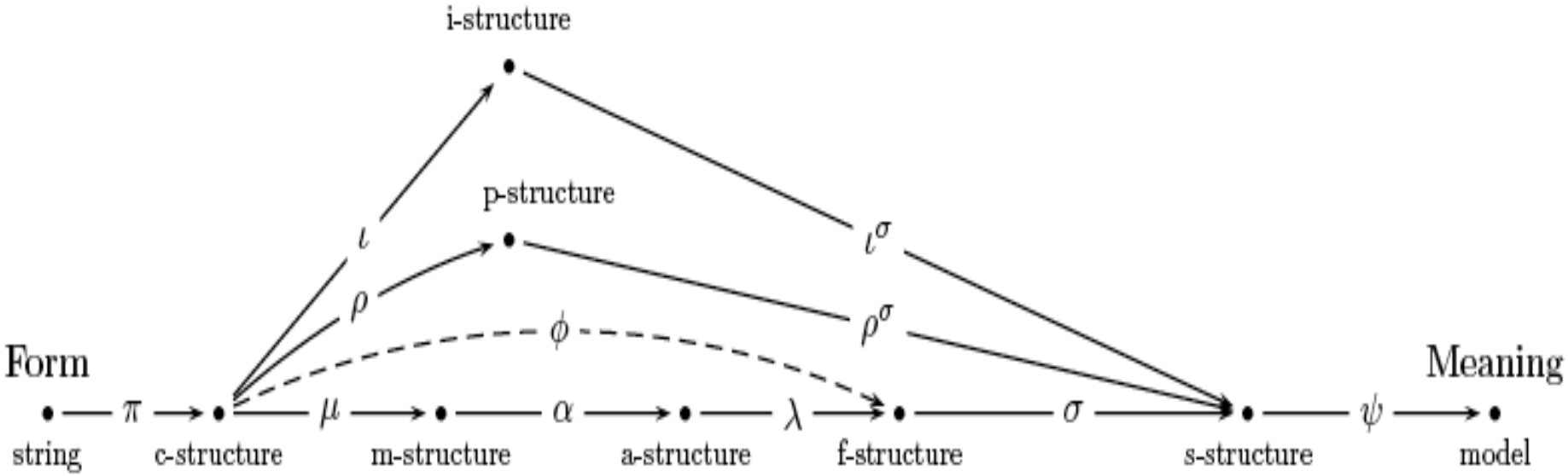

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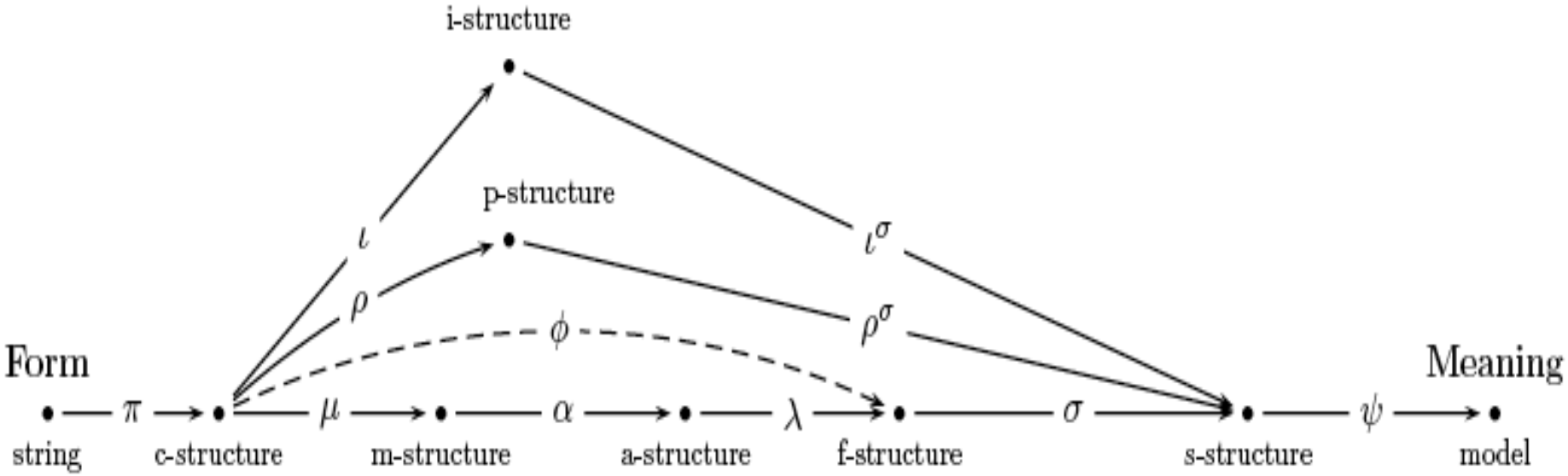

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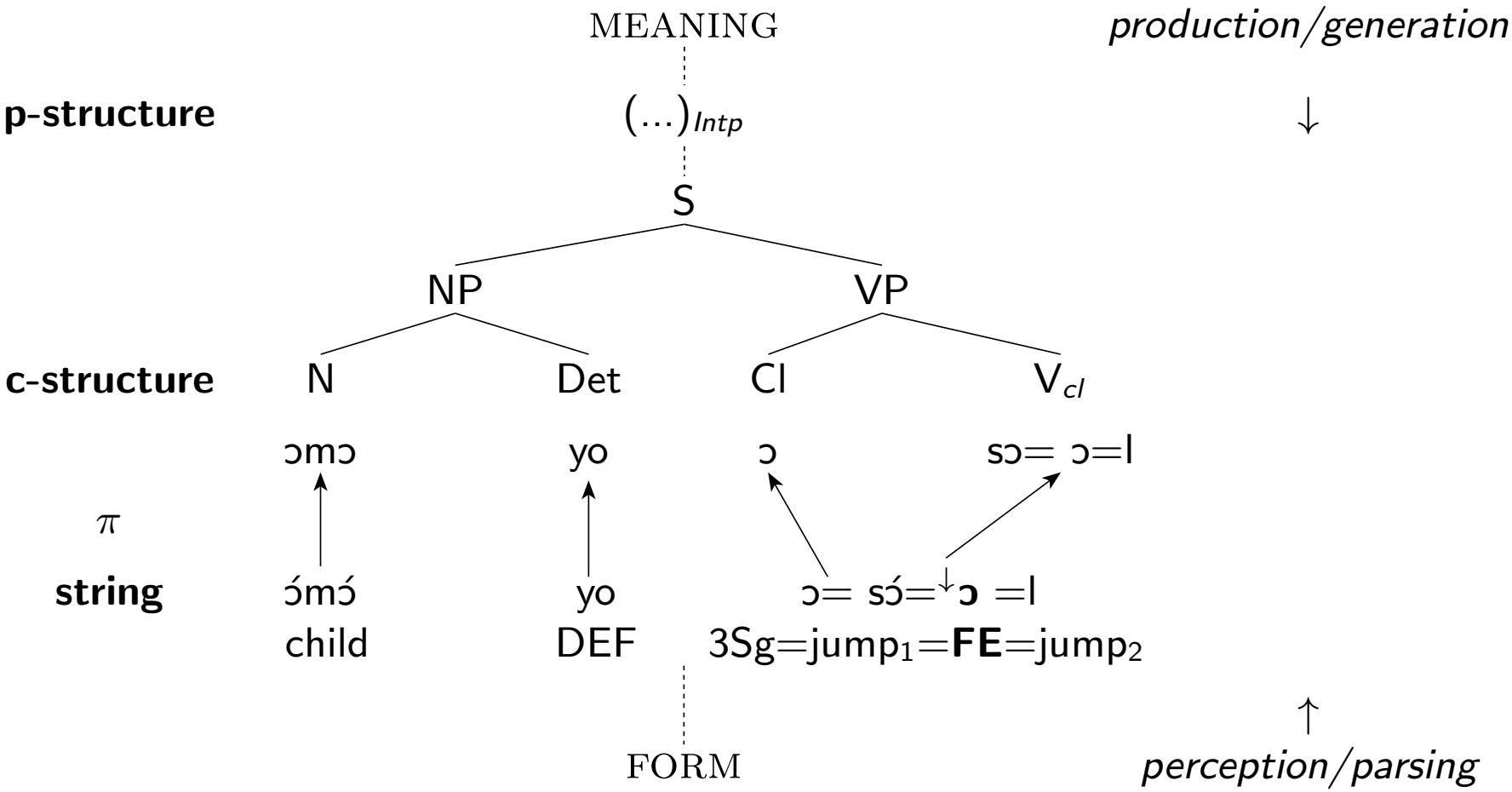
- p-struture projected off c-structure ($\Rightarrow$ syntax determines prosody)

$\rightarrow$ N: $(\uparrow_\rho \text{DOMAIN}) =$ prosodic word

Endoclisis in the current LFG architecture

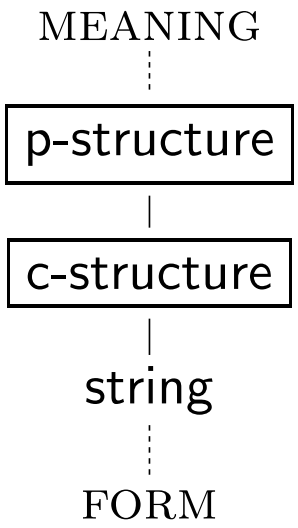


Problems with this approach

1. Violation of Lexical Integrity: c-structure leaves are morphologically fully formed words
2. Problematic with Modularity: How does the information on tone, e.g., 'keep' until p-structure is reached; how does prosodic phrasing 'keep' until the sentence is uttered?
3. How can a clitic be syntactically analysed, if it is 'hidden' within another item?
4. Where are the postlexical phonological rules?
5. Where does the lexicon come in?
6. How are these positioned in relation to p- and c-structure?

New proposal

'Old' architecture



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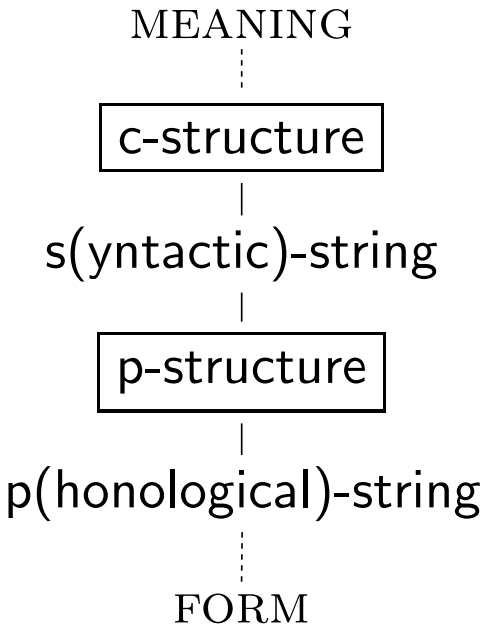

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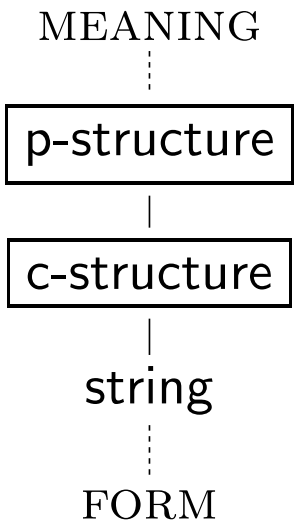

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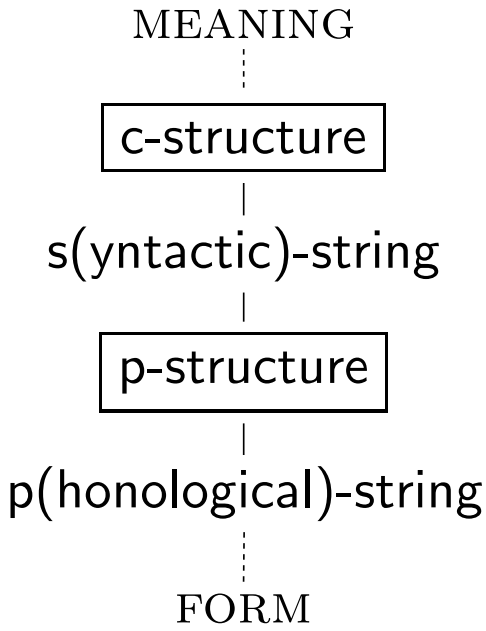

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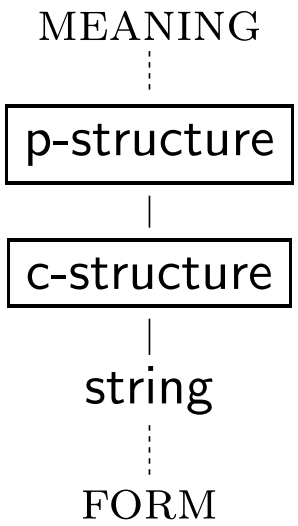

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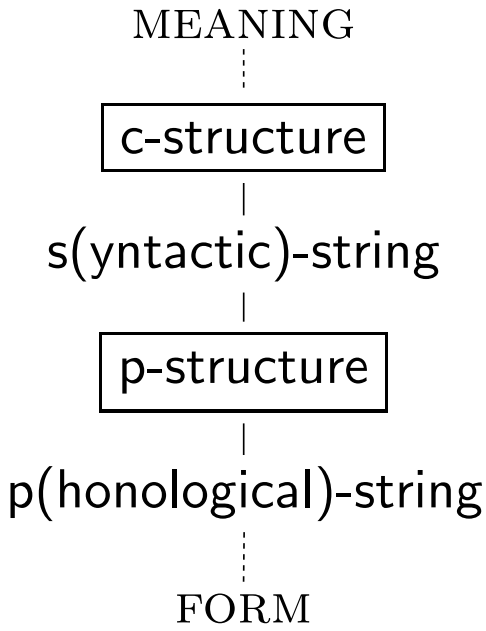
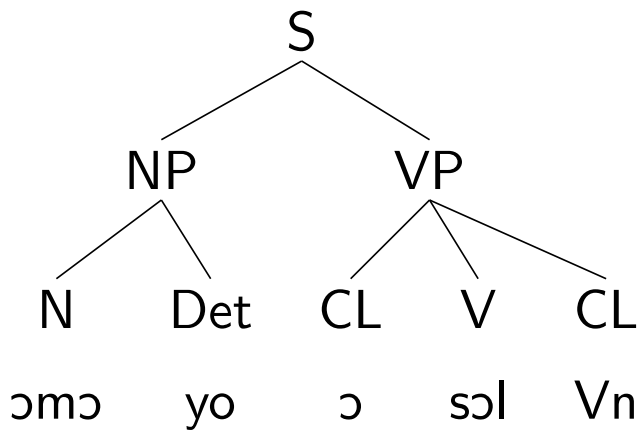


$\rightarrow$ Much closer to models of speech production

$\rightarrow$ New architecture allows for analysis of endoclisis *and* the preservation of Lexical Integrity and Modularity

Syntactic tree as a starting point



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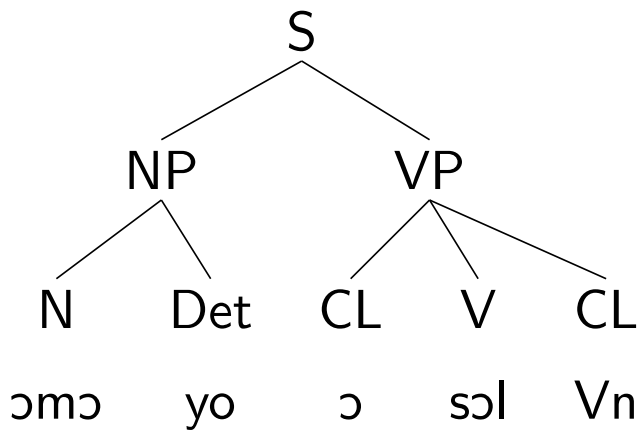

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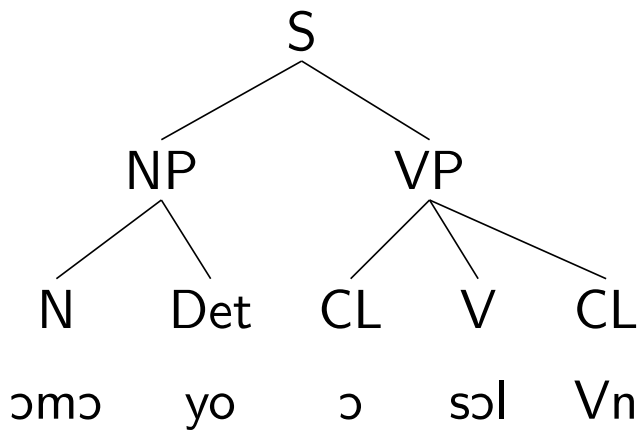

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→ Explain some basic assumptions first:

1. Lexicon
2. P-structure

1. The Multidimensional Lexicon

concept	s-form	p-form	
'child'	ɔmɔ N (↑ PRED) = 'child'	P-FORM	[ɔ́mɔ́]
	...	SEGMENTS	/ɔ m ɔ/
	...	METRICAL FRAME	$(\sigma\sigma)_{pw}$
	...	LEXICAL TONE	HH
'jump'	sɔl V (↑ PRED) = 'jump'	P-FORM	[sɔ́l]
	...	SEGMENTS	/s ɔ l/
	...	METRICAL FRAME	$(\sigma)_{pw}$
	...	LEXICAL TONE	H
factative	Vn CL (↑ STATE) = factative	P-FORM	[V́n]
	...	SEGMENTS	/V n/
	...	METRICAL FRAME	$=\sigma$
	...	LEXICAL TONE	H

→ SEGMENTS: phonological feature bundles

→ METRICAL FRAME: the amount of syllables in the (isolated) lexical item; = indicates need of prosodic host to the left; $()_{pw}$ a prosodic word.

→ LEXICAL TONE: tone present in lexical item (per syllable)

2. P-structure – Previous approaches

- **Prosodic tree**: tree based on the prosodic hierarchy.

→ Difficult to formalize, as prosodic structure is highly flexible

→ Problematic with nested constructions, a.o. (violations of Strict Layer Hypothesis)

→ Additional information (tone, breaks, duration...) has to be encoded separately

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- **Attribute-value matrix**:

$$\ldots \begin{bmatrix} \textit{pros.word} & \begin{bmatrix} \textit{syll}_1 & \begin{bmatrix} \text{VALUE} & [\text{u}] \\ \text{TONE} & \text{H} \end{bmatrix} \\ \textit{syll}_2 & \begin{bmatrix} \text{VALUE} & [\text{go}] \\ \text{TONE} & \text{L} \\ \text{BREAK} & 3 \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

→ Same issues with flexibility, but can encode much more information

→ Drawback: with growing size, the AVM becomes confusing

2. P-structure – The p-diagram

PHRASE	$(\sigma$	$\sigma)_{pw}$	$(\sigma)_{pw}$	$\sigma=$	$(\sigma)_{pw}$	$=\sigma$	
...	...	...	...	...	...		
TONE	H	H	L	L	H	H	
VALUE	/ɔ/	/mɔ/	/yo/	/ɔ/	/sɔl/	/Vn/	
VECTOR	$\mathbf{l_1}$	$\mathbf{l_2}$	$\mathbf{l_3}$	$\mathbf{l_4}$	$\mathbf{l_5}$	$\mathbf{l_6}$	...

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TONE	H	H	L	L	H	H	
VALUE	/ɔ/	/mɔ/	/yo/	/ɔ/	/sɔl/	/Vn/	
VECTOR	$\mathbf{I_1}$	$\mathbf{I_2}$	$\mathbf{I_3}$	$\mathbf{I_4}$	$\mathbf{I_5}$	$\mathbf{I_6}$	…

PHRASE	$(((\sigma$	$\sigma)_{pw}$	$(\sigma)_{pw})_{php}$	$((\sigma$	σ	$\sigma)_{pw})_{php})_{IntP}$	
…	…	…	…	…	…		
TONE	H	H	L	L	H	$^{\downarrow}$H	
VALUE	[ɔ]	[mɔ]	[yo]	[ɔ]	[sɔ]	[ɔl]	
VECTOR	$\mathbf{I_1}$	$\mathbf{I_2}$	$\mathbf{I_3}$	$\mathbf{I_4}$	$\mathbf{I_5}$	$\mathbf{I_6}$	…

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TONE	H	H	L	L	H	H	
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↻
↻ **Postlexical phonological rules**
↻

PHRASE	$(((\sigma$	$\sigma)_{pw}$	$(\sigma)_{pw})_{php}$	$((\sigma$	σ	$\sigma)_{pw})_{php})_{IntP}$	
…	…	…	…	…	…		
TONE	H	H	L	L	H	↓H	
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VECTOR	$\mathbf{I_1}$	$\mathbf{I_2}$	$\mathbf{I_3}$	$\mathbf{I_4}$	$\mathbf{I_5}$	$\mathbf{I_6}$	…

Back to Degema: The syntax-prosody interface

Explained from the view of production/generation, i.e., from MEANING to FORM

Two transfer processes:

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Two transfer processes:

1. *Transfer of vocabulary*: transfers information from the s-string to p-structure via lexical lookup

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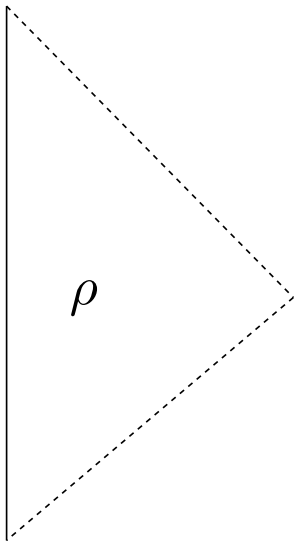
Two transfer processes:

1. *Transfer of vocabulary*: transfers information from the s-string to p-structure via lexical lookup
2. *Transfer of structure*: transfers information from c-structure to p-structure

Transfer of vocabulary

s-string: ɔmɔ yo ɔ sɔl Vn



s-form	p-form	
ɔmɔ N (↑ PRED) = 'child'	SEGMENTS	/ɔ m ɔ/
...	METRICAL FRAME	$(\sigma\sigma)_{pw}$
...	LEXICAL TONE	HH
sɔl V (↑ PRED) = 'jump'	SEGMENTS	/s ɔ l/
...	METRICAL FRAME	$(\sigma)_{pw}$
...	LEXICAL TONE	H
Vn CL (↑ STATE) = factative	SEGMENTS	/V n/
...	METRICAL FRAME	$=\sigma$
...	LEXICAL TONE	H

PHRASE	$(\sigma$	$\sigma)_{pw}$	$(\sigma)_{pw}$	$\sigma=$	$(\sigma)_{pw}$	$=\sigma$	
...	...	...	...	...	...		
TONE	H	H	L	L	H	H	
VALUE	/ɔ/	/mɔ/	/yo/	/ɔ/	/sɔl/	/Vn/	
VECTOR	$\mathbf{I_1}$	$\mathbf{I_2}$	$\mathbf{I_3}$	$\mathbf{I_4}$	$\mathbf{I_5}$	$\mathbf{I_6}$	...

Transfer of structure – match theory

Assumption: prosodic phrasing is partly determined by syntactic phrasing: *match theory*, following Selkirk (2011, a.o.):

- every syntactic clause matches an intonational phrase (IntP)
- every syntactic phrase matches a phonological phrase
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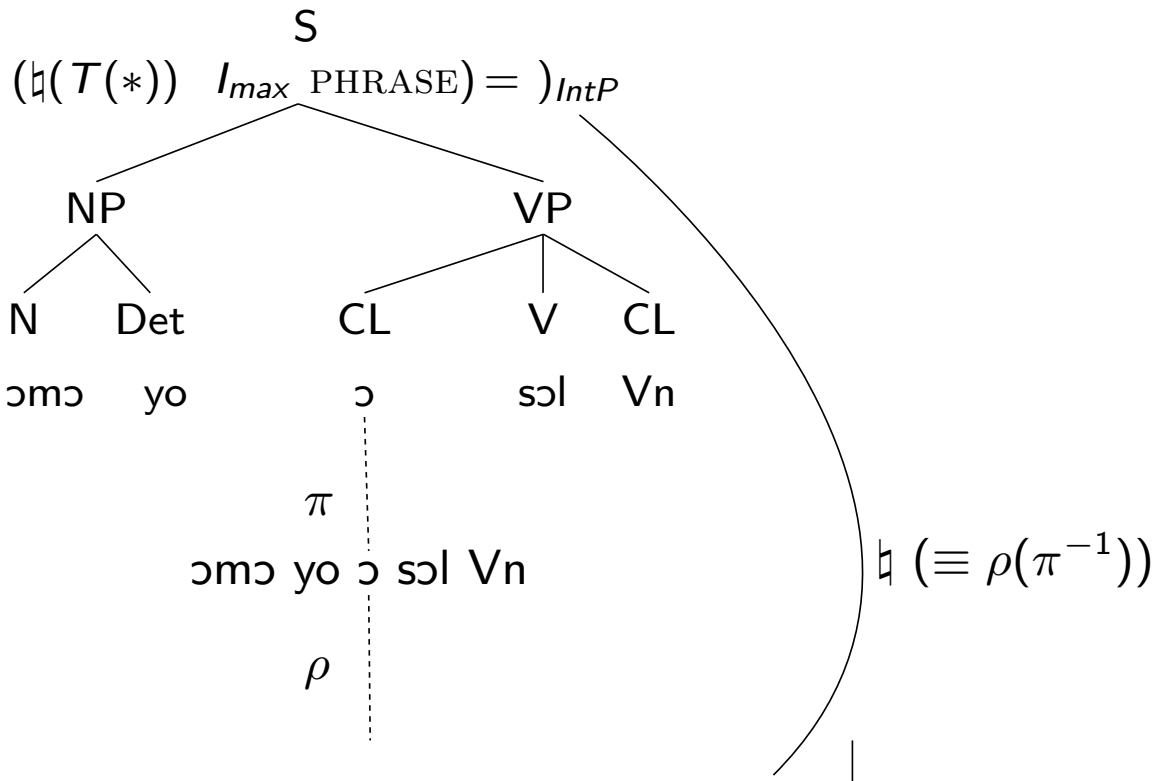
This approach:

→ Each syntactic clause matches an intonational phrase

→ Phrasing refined at later stage to account for non-isomorphism

Transfer of structure



PHRASE	$(\sigma$	$\sigma)_{pw}$	$(\sigma)_{pw}$	$\sigma=$	$(\sigma)_{pw}$	$=\sigma)_{IntP}$	
...	...	...	...	...	...		
TONE	H	H	L	L	H	H	
VALUE	/ɔ/	/mɔ/	/yo/	/ɔ/	/sɔl/	/Vn/	
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Postlexical phonological rules

PHRASE	...	$(\sigma)_{pw}$	$=\sigma)_{IntP}$	
TONE	...	H	H	
VALUE	...	/sɔl/	/Vn/	
VECTOR	...	$\mathbf{I_5}$	$\mathbf{I_6}$	...

Postlexical phonological rules

PHRASE	...	$(\sigma)_{pw}$	$=\sigma)_{IntP}$	
TONE	...	H	H	
VALUE	...	/sɔl/	/Vn/	
VECTOR	...	I_5	I_6	...

PHRASE	...	$(\sigma$	$\sigma)_{pw})_{IntP}$	
TONE	...	H	H	
VALUE	...	/sɔl/	/Vn/	
VECTOR	...	I_5	I_6	...

1. if clitic present then incorporate into prosodic word domain of host:
   $\ldots\ )_{pw}\ =\sigma \longrightarrow \ldots\ =\sigma)_{pw}$

Postlexical phonological rules

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2. if factative in IntP medial position, then realise as *n*; delete in context C _ C:
   $=vn \longrightarrow$ n / C _ V, V _ C, V _ V and $=vn \longrightarrow \emptyset$ / C _ C

Postlexical phonological rules

PHRASE	...	$(\sigma)_{pw}$	$=\sigma)_{IntP}$	
TONE	...	H	H	
VALUE	...	/sɔl/	/Vn/	
VECTOR	...	I_5	I_6	...

PHRASE	...	$(\sigma$	$\sigma)_{pw})_{IntP}$	
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3. if factative in IntP final position, then realise as *vn*:
   $=vn \longrightarrow =vn\ /\ [\ldots]\ \_\ )_{IntP}$
   - if host ends in C, then swap position with C and delete *n*:
     $Cvn \longrightarrow vC\ /\ \_\ )_{IntP}$

Postlexical phonological rules

PHRASE	...	$(\sigma)_{pw}$	$=\sigma)_{IntP}$	
TONE	...	H	H	
VALUE	...	/sɔl/	/Vn/	
VECTOR	...	$\mathbf{I_5}$	$\mathbf{I_6}$	...

PHRASE	...	$(\sigma$	$\sigma)_{pw})_{IntP}$	
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Postlexical phonological rules

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VALUE	...	/sɔl/	/Vn/	
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PHRASE	...	$(\sigma$	$\sigma)_{pw})_{IntP}$	
TONE	...	H	$^{\downarrow}$H	
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VECTOR	...	$\mathbf{I_5}$	$\mathbf{I_6}$	...

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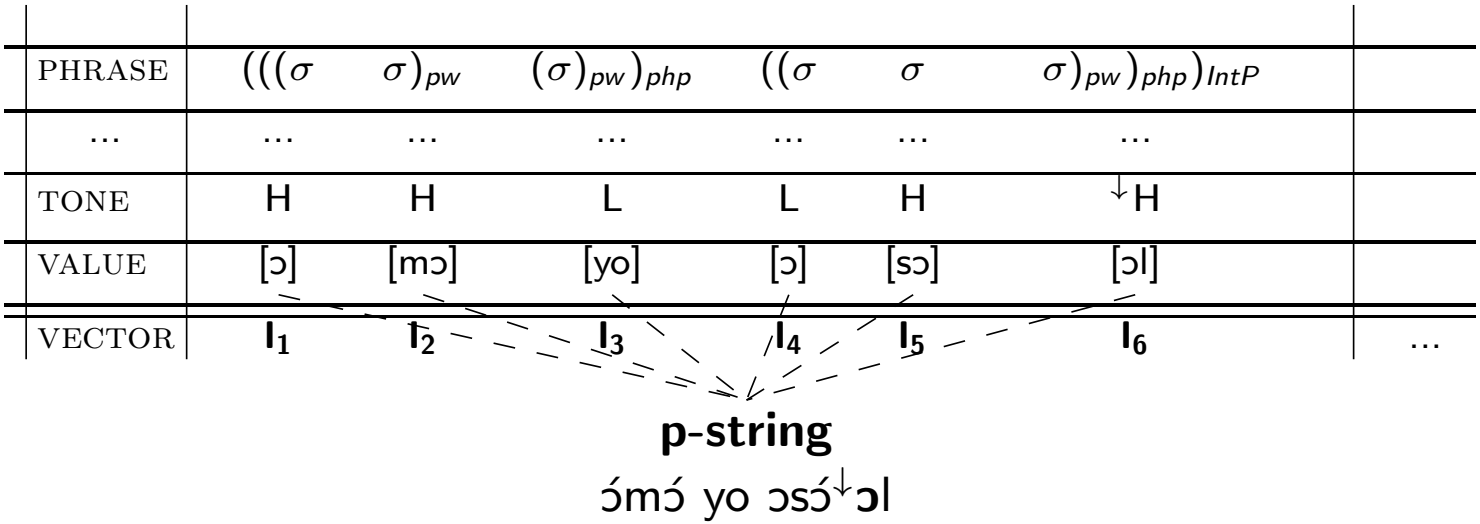
3. if factative in IntP final position, then realise as *vn*:
   $=v$n $\longrightarrow =v$n / [...] _ $)_{IntP}$
   - if host ends in C, then swap position with C and delete *n*:
     C*v*n $\longrightarrow$ *v*C / _ $)_{IntP}$
4. apply vowel harmony: $v \longrightarrow V_i$ / V_i _ C$)_{pw}$
5. apply tone downstepping: [+H][+H] $\longrightarrow$ [+H][$^{\downarrow}$H]

The output of p-structure

⇒ Contribution of syntax, lexicon, and postlexical phonological rules to the generation of a speech signal



P-string: linear order of elements as they would be *pronounced*.

vs.

S-string: linear order of elements as they would be *syntactically analysed*.

Conclusion

- P-string and s-string are not parallel.

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$\Rightarrow$ Modularity is maintained.

$\Rightarrow$ The Principle of Lexical Integrity is not violated in this approach.

Thank you!

... questions, comments...?

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