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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This talk ...

**Endoclisis**: a clitic occurs within the stem of its host
- Rare, but found to exist in Udi (Harris 2002) and Pashto (Tegey 1977)
- Problematic for the concept of Lexical Integrity
- Challenging from the view of Modularity
Endoclis is: a clitic occurs within the stem of its host
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This talk:
- Presents Degema endoclis (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

- **Syllable structure**: V, VC, CV, CVC. Consonant clusters avoided, unless consonant can resyllabify to a following vowel.
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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.


- 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
Form of the factative

The clitic’s form depends on
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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.
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The clitic’s form depends on

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 enclitic with preceding vowel

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

(1) Breno o=síré tǎ=n mú 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 ãól-ām ójzí yo i=díyómósé=n ávom ḃáaw.
we hold-GER thief DEF 3Sg=sweeten=FE inside their
‘It pleased them that we caught the thief.’

(Kari 2004, 50)
3. Phonological environment: Consonant–Factative–Vowel (xxC =n Vxx)

(3) Ubwan i=kél=n ñsóm yo
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) Ē=yáw mú ínwíny útany
3Pl=take.FE from body tree
'They got it from a tree.'

(Kari 2004, 200)
5. Phonological environment: **Vowel–Factative** \((xxV = Vn)\)

\[(5) \text{O=írí=én}\]

\[3\text{Sg=run=FE}\]

‘(S)he ran.’  

(Kari 2004, 72)

- In contrast to the clause-medial position, the underspecified vowel of the clitic is realised.
5. Phonological environment: **Vowel–Factative** \((\text{xxV} \rightarrow \text{Vn})\)

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- In contrast to the clause-medial position, the underspecified vowel of the clitic is realised.
- It copies the features of the host’s last vowel
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- In contrast to the clause-medial position, the underspecified vowel of the clitic is realised.
- 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**

\[(6) \text{O=bó=↓o=l}\]
\[3\text{Sg}=\text{hold}_1=\text{FE}=\text{hold}_2\]
‘(S)he held (a cloth).’

(Kari 2004, 72)


- ból + Vn
6. Phonological environment: **Consonant-Factative (xxVVC) → endoclisis**

(6) O=bó=↓o=l

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- *metathesis* moves Vn into word stem: bóVnl
Clause-final position with preceding consonant

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(6) O=b´ o=↓o=I
    3Sg=hold₁=FE=hold₂
    ‘(S)he held (a cloth).’


- ból + Vn
- *metathesis* moves Vn into word stem: bóVnl
- The vowel copies all features from the host’s vowel
  → However, still clearly indicated by the downstep in the speech signal
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   - ból + Vn
   - *metathesis* moves Vn into word stem: bóVnl
   - The vowel copies all features from the host’s vowel
   - However, still clearly indicated by the downstep in the speech signal
   - The *n* is deleted: bó↓ol (avoid consonant clusters)
Clause-final position in matrix and subordinate clause

(7) *Enclitic*

[Óhó nób o=yí=↓in] mi=mésé=t↓e
time that 3Sg=come=FE 1Sg=sleep=PE
‘I had slept when (s)he came.’

(Kari 2004, 58)

(8) *Endoclitic*

[Fiwol ọ=kpérı ɓá=↓a=w] é=y↓i
PN 3Sg=tell them₁=FE=them₂ 3Pl=come
‘Fiwol told them to come.’

(Kari 2004, 108)
Syntactic or prosodic phrase?

Up to now: prosodic phrasing isomorphic with syntactic phrasing.
Syntactic or prosodic phrase?

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→ Whether the trigger is syntactic or prosodic is most relevant for the analysis
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→ Whether the trigger is syntactic or prosodic is most relevant for the analysis
→ Evidence from the definite marker yo:

(9) (mı=m´n ówéj [nú baw e=kótú=nn}_{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
→ But not at the end of a prosodic phrase – non-isomorphic
Syntactic or prosodic phrase?

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‘I saw the person who they called.’ (Kari, p.c.)

→ Realised as clause-medial, even though at the end of a syntactic phrase
→ But not at the end of a prosodic phrase – non-isomorphic
⇒ **Conclusion**: Prosodic phrasing triggers the clitic’s realization
An example ...

(10) \( \text{girl} \text{DEF 3Sg=jump}_1=\text{FE}=\text{jump}_2 \text{3Sg=also play}=\text{FE} \text{dance} \)

'The girl jumped and danced.'

(Kari, p.c.)
## Factative Paradigm

<table>
<thead>
<tr>
<th>phrase position</th>
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</tr>
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<tbody>
<tr>
<td>medial</td>
<td>xx$V=n$ C$xxx$</td>
</tr>
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<tr>
<td>medial</td>
<td>xx$C$ C$xxx$</td>
</tr>
<tr>
<td>final</td>
<td>$xV\downarrow V C$</td>
</tr>
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<td>$xV = \downarrow V n$</td>
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**factors relevant for the clitic’s realisation:**
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→ **structure** (=phrase position; but also sentence type) ...
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**factors relevant for the clitic’s realisation:**

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→ **vocabulary** (lexical items and their phonological features) ...
→ **constraints**: consonant cluster, ...
→ **processes triggered**: deletion, metathesis ...
→ **other processes**: vowel harmony, phrasing ...
⇒ can be realised with **postlexical phonology**
Figure: LFG’s correspondence architecture (Asudeh 2006).
LFG’s Grammar architecture

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string is placed with FORM
**LFG’s Grammar architecture**

![LFG's Grammar architecture](image)

**Figure:** LFG’s correspondence architecture (Asudeh 2006).

- string is placed with **FORM**
- string instantiates information from each item to terminal nodes of c-structure via relation $\pi$
LFG’s Grammar architecture

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

- string is placed with FORM
- string instantiates information from each item to terminal nodes of c-structure via relation $\pi$
- p-structure projected off c-structure ($\Rightarrow$ syntax determines prosody)
- $N: (\uparrow_\rho \text{DOMAIN}) = \text{prosodic word}$
Endoclisism in the current LFG architecture

**p-structure**

```
S
  / \  
NP   VP
  /   
N     Det
  /  
child
  / 
π
```

**c-structure**

```
S
  / \  
NP   VP
  /   
S
  /  
N     Det
  /  
child
  / 
π
```

**Meaning**

```
(\ldots)_{Intp}
```

**Production/generation**

```
π
```

**Perception/parsing**

```
π
```

Bögel (University of Konstanz)
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

MEANING
  p-structure
  c-structure
    string
      FORM

⇒

New Proposal

MEANING
  c-structure
  s(yntactic)-string
    p-structure
      p(honological)-string
        FORM
New proposal

‘Old’ architecture

MEANING
  ↓
  p-structure
    ↓
    c-structure
      ↓
      string
        ↓
        FORM

New Proposal

MEANING
  ↓
c-structure
  ↓s(yntactic)-string
  ↓p-structure
    ↓p(honological)-string
      ↓FORM

→ Much closer to models of speech production
New proposal

→ Much closer to models of speech production
→ New architecture allows for analysis of endoclisys and the preservation of Lexical Integrity and Modularity
Syntactic tree as a starting point
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Easier to analyse clitics, no violation of lexical integrity
Syntactic tree as a starting point

Easier to analyse clitics, no violation of lexical integrity

→ Explain some basic assumptions first:

1. Lexicon
2. P-structure
## 1. The Multidimensional Lexicon

<table>
<thead>
<tr>
<th>Concept</th>
<th>s-form</th>
<th>p-form</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘child’</td>
<td>N (↑ PRED) = ‘child’</td>
<td>P-FORM [ʒmʒ]</td>
</tr>
<tr>
<td></td>
<td>...</td>
<td>SEGMENTS /ɔ m ɔ/</td>
</tr>
<tr>
<td></td>
<td>...</td>
<td>METRICAL FRAME (σσ)_pw</td>
</tr>
<tr>
<td></td>
<td>...</td>
<td>LEXICAL TONE HH</td>
</tr>
<tr>
<td>‘jump’</td>
<td>V (↑ PRED) = ‘jump’</td>
<td>P-FORM [sɔl]</td>
</tr>
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<td>...</td>
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</tr>
<tr>
<td></td>
<td>...</td>
<td>LEXICAL TONE H</td>
</tr>
<tr>
<td>factative</td>
<td>Vn CL (↑ STATE) = factative</td>
<td>P-FORM [Vn]</td>
</tr>
<tr>
<td></td>
<td>...</td>
<td>SEGMENTS /V n/</td>
</tr>
<tr>
<td></td>
<td>...</td>
<td>METRICAL FRAME =σ</td>
</tr>
<tr>
<td></td>
<td>...</td>
<td>LEXICAL TONE H</td>
</tr>
</tbody>
</table>

→ **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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  - Additional information (tone, breaks, duration...) has to be encoded separately
- **Attribute-value matrix**:
  \[
  \begin{bmatrix}
  \text{pros.word} \\
  \text{syll}_1 \\
  \text{syll}_2
  \end{bmatrix}
  \begin{bmatrix}
  \text{VALUE} \\
  \text{TONE} \\
  \text{BREAK}
  \end{bmatrix}
  \begin{bmatrix}
  \text{[u]} \\
  \text{H} \\
  \text{3}
  \end{bmatrix}
  \]
  - Same issues with flexibility, but can encode much more information
  - Drawback: with growing size, the AVM becomes confusing
2. P-structure – The p-diagram

<table>
<thead>
<tr>
<th>PHRASE</th>
<th>$(\sigma \quad \sigma)_{pw}$</th>
<th>$(\sigma)_{pw}$</th>
<th>$\sigma = (\sigma)_{pw}$</th>
<th>$\equiv \sigma$</th>
</tr>
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<tbody>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>TONE</td>
<td>H</td>
<td>H</td>
<td>L</td>
<td>L</td>
</tr>
<tr>
<td>VALUE</td>
<td>/ɔ/</td>
<td>/mɔ/</td>
<td>/ɔ/</td>
<td>/ɔ/</td>
</tr>
<tr>
<td>VECTOR</td>
<td>$l_1$</td>
<td>$l_2$</td>
<td>$l_3$</td>
<td>$l_4$</td>
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<tbody>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>TONE</td>
<td>(H)</td>
<td>(H)</td>
<td>(L)</td>
<td>(L)</td>
</tr>
<tr>
<td>VALUE</td>
<td>[/\text{\textipa{c}}/]</td>
<td>[/\text{\textipa{m\textipa{c}}}/]</td>
<td>[/\text{\textipa{yo}}/]</td>
<td>[/\text{\textipa{c}}/]</td>
</tr>
<tr>
<td>VECTOR</td>
<td>(I_1)</td>
<td>(I_2)</td>
<td>(I_3)</td>
<td>(I_4)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PHRASE</th>
<th>(((\sigma \quad \sigma)<em>{pw} \quad (\sigma)</em>{pw})_{php})</th>
<th>(((\sigma \quad \sigma \quad \sigma)<em>{pw})</em>{php})</th>
<th>(\text{IntP})</th>
</tr>
</thead>
<tbody>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>TONE</td>
<td>(H)</td>
<td>(H)</td>
<td>(L)</td>
</tr>
<tr>
<td>VALUE</td>
<td>[/\text{\textipa{\textipa{c}}}/]</td>
<td>[/\text{\textipa{m\textipa{c}}}/]</td>
<td>[/\text{\textipa{yo}}/]</td>
</tr>
<tr>
<td>VECTOR</td>
<td>(I_1)</td>
<td>(I_2)</td>
<td>(I_3)</td>
</tr>
</tbody>
</table>
2. P-structure – The p-diagram

<table>
<thead>
<tr>
<th>PHRASE</th>
<th>$(\sigma \ \sigma)<em>{pw} \ (\sigma)</em>{pw} \ \sigma = (\sigma)_{pw} = \sigma$</th>
</tr>
</thead>
<tbody>
<tr>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>TONE</td>
<td>$H \ H \ L \ L \ H \ H$</td>
</tr>
<tr>
<td>VALUE</td>
<td>$/\circ/ \ /\text{mc}/ \ /\text{yo}/ \ /\circ/ \ /\text{scl}/ \ /\text{vn}/$</td>
</tr>
<tr>
<td>VECTOR</td>
<td>$I_1 \ I_2 \ I_3 \ I_4 \ I_5 \ I_6 \ ...$</td>
</tr>
</tbody>
</table>

Postlexical phonological rules

<table>
<thead>
<tr>
<th>PHRASE</th>
<th>$(((\sigma \ \sigma)<em>{pw} (\sigma)</em>{pw})<em>{php} (((\sigma \ \sigma \ \sigma)</em>{pw})<em>{php})</em>{IntP}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>TONE</td>
<td>$H \ H \ L \ L \ H \ \downarrow H$</td>
</tr>
<tr>
<td>VALUE</td>
<td>$[\circ] \ [\text{mc}] \ [\text{yo}] \ [\circ] \ [\text{scl}] \ [\text{cl}]$</td>
</tr>
<tr>
<td>VECTOR</td>
<td>$I_1 \ I_2 \ I_3 \ I_4 \ I_5 \ I_6 \ ...$</td>
</tr>
</tbody>
</table>
Back to Degema: The syntax-prosody interface

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

Two transfer processes:
Back to Degema: The syntax-prosody interface

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

Two transfer processes:

1. Transfer of vocabulary: transfers information from the s-string to p-structure via lexical lookup
Explained from the view of production/generation, i.e., from MEANING to FORM

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:**

\[ \text{s-form} \quad \text{p-form} \]

<table>
<thead>
<tr>
<th>PHRASE</th>
<th>((\sigma \quad \sigma)_{pw})</th>
<th>((\sigma)_{pw})</th>
<th>(\sigma=)</th>
<th>((\sigma)_{pw})</th>
<th>(=\sigma)</th>
</tr>
</thead>
<tbody>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>TONE</td>
<td>H</td>
<td>H</td>
<td>L</td>
<td>L</td>
<td>H</td>
</tr>
<tr>
<td>VALUE</td>
<td>/ɔ/</td>
<td>/ɔmɔ/</td>
<td>/ɔyo/</td>
<td>/ɔ/</td>
<td>/ɔsɔl/</td>
</tr>
<tr>
<td>VECTOR</td>
<td>(l_1)</td>
<td>(l_2)</td>
<td>(l_3)</td>
<td>(l_4)</td>
<td>(l_5)</td>
</tr>
</tbody>
</table>
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
- ...
**Transfer of structure – match theory**

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**This approach:**
Transfer of structure – match theory

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**This approach**:

→ Each syntactic clause matches an intonational phrase
Transfer of structure – match theory

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- every syntactic clause matches an intonational phrase (IntP)
- every syntactic phrase matches a phonological phrase
- ...

**This approach**:

- Each syntactic clause matches an intonational phrase
- Phrasing refined at later stage to account for non-isomorphism
Transfer of structure

\[
S \left( \text{max}_{\text{PHRASE}} \right) = I_{\text{IntP}}
\]

\[
\begin{array}{c}
\text{NP} \\
\text{N, Det}
\end{array} \quad \begin{array}{c}
\text{VP} \\
\text{CL, V, CL}
\end{array}
\]

\[
\pi \quad \text{inc, oj, cl, Vn}
\]

\[
\rho (\equiv \rho (\pi^{-1}))
\]

<table>
<thead>
<tr>
<th>PHRASE</th>
<th>(\sigma_{pw} \sigma_{pw})</th>
<th>(\sigma_{pw} \sigma_{pw})</th>
<th>\sigma = (\sigma_{pw} = \sigma)_{\text{IntP}}</th>
</tr>
</thead>
<tbody>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>TONE</td>
<td>H H L L H H</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VALUE</td>
<td>/ɔ/ /mo/ /yo/</td>
<td>/ɔ/ /sɔl/ /Vn/</td>
<td></td>
</tr>
<tr>
<td>VECTOR</td>
<td>I_1 I_2 I_3</td>
<td>I_4 I_5 I_6</td>
<td>...</td>
</tr>
</tbody>
</table>
### Postlexical phonological rules

<table>
<thead>
<tr>
<th>PHRASE</th>
<th>...</th>
<th>((\sigma)<em>{pw} = \sigma)</em>{IntP}</th>
</tr>
</thead>
<tbody>
<tr>
<td>TONE</td>
<td>...</td>
<td>H</td>
</tr>
<tr>
<td>VALUE</td>
<td>...</td>
<td>/s,o/</td>
</tr>
<tr>
<td>VECTOR</td>
<td>...</td>
<td>I_5</td>
</tr>
</tbody>
</table>
Postlexical phonological rules

<table>
<thead>
<tr>
<th>PHRASE</th>
<th>...</th>
<th>(σ)<em>pw = σ)</em>{IntP}</th>
</tr>
</thead>
<tbody>
<tr>
<td>TONE</td>
<td>...</td>
<td>H     H</td>
</tr>
<tr>
<td>VALUE</td>
<td>...</td>
<td>/sO/  /Vn/</td>
</tr>
<tr>
<td>VECTOR</td>
<td>...</td>
<td>l5     l6</td>
</tr>
</tbody>
</table>

1. if clitic present then incorporate into prosodic word domain of host:

   ... )pw =σ → ... =σ)pw
### Postlexical phonological rules

**1.** If clitic present then incorporate into prosodic word domain of host:

\[
\ldots \left( \sigma \right)_{pw} = \sigma \rightarrow \ldots = \sigma_{pw}
\]

**2.** If factative in IntP medial position, then realise as \(n\); delete in context \(C \_ C\):

\[
\begin{align*}
\ldots \left( \sigma \_ \sigma \right)_{pw} \rightarrow \left( \sigma \_ \sigma \right)_{IntP} \\
\text{TONE} & \rightarrow H \_ H \\
\text{VALUE} & \rightarrow /s\_l/ \_ /Vn/ \\
\text{VECTOR} & \rightarrow I_5 \_ I_6 \_ ...
\end{align*}
\]

\[
\begin{align*}
\ldots \left( \sigma \_ \sigma \right)_{pw} \rightarrow \left( \sigma \_ \sigma \right)_{IntP} \\
\text{TONE} & \rightarrow H \_ H \\
\text{VALUE} & \rightarrow /s\_l/ \_ /Vn/ \\
\text{VECTOR} & \rightarrow I_5 \_ I_6 \_ ...
\end{align*}
\]

\[
\begin{align*}
\text{PHRASE} & \rightarrow \ldots \left( \sigma \_ \sigma \right)_{pw} \rightarrow \ldots \left( \sigma \_ \sigma \right)_{IntP} \\
\text{TONE} & \rightarrow H \_ H \\
\text{VALUE} & \rightarrow /s\_l/ \_ /Vn/ \\
\text{VECTOR} & \rightarrow I_5 \_ I_6 \_ ...
\end{align*}
\]
Postlexical phonological rules

<table>
<thead>
<tr>
<th>PHRASE</th>
<th>...</th>
<th>(σ)\text{pw} = σ)\text{IntP}</th>
<th>...</th>
</tr>
</thead>
<tbody>
<tr>
<td>TONE</td>
<td>...</td>
<td>H H</td>
<td>...</td>
</tr>
<tr>
<td>VALUE</td>
<td>...</td>
<td>/s\text{\textalpha}\text{\textbeta}/ /V\text{n}/</td>
<td>...</td>
</tr>
<tr>
<td>VECTOR</td>
<td>...</td>
<td>I_5 I_6</td>
<td>...</td>
</tr>
</tbody>
</table>

1. If clitic present then incorporate into prosodic word domain of host:

   \[
   \ldots )\text{pw} = σ \rightarrow \ldots = (σ)\text{pw} \]

2. If factative in IntP medial position, then realise as \(n\); delete in context C C:

   \[
   =vn \rightarrow n / C \_ V, V \_ C, V \_ V \quad \text{and} \quad =vn \rightarrow \emptyset / C \_ C
   \]

3. If factative in IntP final position, then realise as \(vn\):

   \[
   =vn \rightarrow =vn / [\ldots \_ )\text{IntP}
   \]

   - If host ends in C, then swap position with C and delete \(n\):

     \[
     Cvn \rightarrow vC / \_ )\text{IntP}
     \]
Postlexical phonological rules

1. if clitic present then incorporate into prosodic word domain of host:
   \[\ldots \sigma^{pw} \rightarrow \ldots \sigma^{pw}\]

2. if factative in IntP medial position, then realise as \(n\); delete in context \(C \_ C\):
   \[=vn \rightarrow n / C \_ V, V \_ C, V \_ V \quad \text{and} \quad =vn \rightarrow \emptyset / C \_ C\]

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

4. apply vowel harmony: \(v \rightarrow V_i / V_i \_ C)_{pw}\)
### Postlexical phonological rules

<table>
<thead>
<tr>
<th>PHRASE</th>
<th>...</th>
<th>( (\sigma)<em>{pw} = \sigma )</em>{IntP}</th>
</tr>
</thead>
<tbody>
<tr>
<td>TONE</td>
<td>...</td>
<td>( H ) ( H )</td>
</tr>
<tr>
<td>VALUE</td>
<td>...</td>
<td>/\sigma l/ /\nu n/</td>
</tr>
<tr>
<td>VECTOR</td>
<td>...</td>
<td>( I_5 ) ( I_6 ) ...</td>
</tr>
</tbody>
</table>

1. if clitic present then incorporate into prosodic word domain of host:
   \[ ... \)_{pw} = \sigma \rightarrow ... = \sigma \)_{pw} \]

2. if factative in IntP medial position, then realise as \( n \); delete in context \( C \_ C \):
   \[ = \nu n \rightarrow n / C \_ V, V \_ C, V \_ V \] 
   \[ \text{and} \] 
   \[ = \nu n \rightarrow \emptyset / C \_ C \]

3. if factative in IntP final position, then realise as \( \nu n \):
   \[ = \nu n \rightarrow = \nu n / [... \)_{IntP} \]
   \[ \text{if host ends in} C, \text{then swap position with} C \text{and delete} n: \]
   \[ C \nu n \rightarrow \nu C / \_ \)_{IntP} \]

4. apply vowel harmony: \( \nu \rightarrow V_i / V_i \_ C \)_{pw} \]

5. apply tone downstepping: \([+H][+H] \rightarrow [+H][↓H]\)
The output of p-structure

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

<table>
<thead>
<tr>
<th>PHRASE</th>
<th>(((σ σ)pw) ((σ)pw)php) ((σ σ (σ)pw)php)IntP</th>
</tr>
</thead>
<tbody>
<tr>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>TONE</td>
<td>H   H   L   L   H   H♭H</td>
</tr>
<tr>
<td>VALUE</td>
<td>[ɔ] [mɔ] [yo] [ɔ] [ɔ] [ɔl]</td>
</tr>
<tr>
<td>VECTOR</td>
<td>l₁ l₂ l₃ l₄ l₅ l₆ ...</td>
</tr>
</tbody>
</table>

**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.
Conclusion

- P-string and s-string are not parallel.
- Transfer of information at the syntax-prosody interface via:
  1. transfer of vocabulary (via a multidimensional lexicon)
  2. transfer of structure (via the $\mathbb{H}$-projection)
Conclusion

- P-string and s-string are not parallel.
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  1. transfer of vocabulary (via a multidimensional lexicon)
  2. transfer of structure (via the $\mathbb{P}$-projection)
- Postlexical phonological rules operate on the ‘preliminary’ p-diagram.
Conclusion

- P-string and s-string are not parallel.
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  1. transfer of vocabulary (via a multidimensional lexicon)
  2. transfer of structure (via the €-projection)
- Postlexical phonological rules operate on the ‘preliminary’ p-diagram.
- The output is the contribution of syntax, lexicon and postlexical phonology to the speech signal.
Conclusion

- P-string and s-string are not parallel.
- Transfer of information at the syntax-prosody interface via
  1. transfer of vocabulary (via a multidimensional lexicon)
  2. transfer of structure (via the \[\natural\]-projection)
- Postlexical phonological rules operate on the ‘preliminary’ p-diagram.
- The output is the contribution of syntax, lexicon and postlexical phonology to the speech signal.
- This process is reversible to a certain extent (all vocabulary, part of prosodic structure).
Conclusion

- P-string and s-string are not parallel.
- Transfer of information at the syntax-prosody interface via
  1. transfer of vocabulary (via a multidimensional lexicon)
  2. transfer of structure (via the ♯-projection)
- Postlexical phonological rules operate on the ‘preliminary’ p-diagram.
- The output is the contribution of syntax, lexicon and postlexical phonology to the speech signal.
- This process is reversible to a certain extent (all vocabulary, part of prosodic structure).
  ⇒ Modularity is maintained.
P-string and s-string are not parallel.

Transfer of information at the syntax-prosody interface via
1. transfer of vocabulary (via a multidimensional lexicon)
2. transfer of structure (via the $\downarrow$-projection)

Postlexical phonological rules operate on the ‘preliminary’ p-diagram.

The output is the contribution of syntax, lexicon and postlexical phonology to the speech signal.

This process is reversible to a certain extent (all vocabulary, part of prosodic structure).

⇒ Modularity is maintained.

⇒ The Principle of Lexical Integrity is not violated in this approach.
Thank you!

... questions, comments...?
References