PHONOLOGICAL CONSTITUENTS IN ARMENIAN
WHEN CYCLICITY MISALIGNS

Hossep Dolatian

Stony Brook University

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Phonology and morphology interact a lot (Inkelas, 1989, 2014)

A lot of theoretical models...
Phonology and morphology interact a lot (Inkelas, 1989, 2014)

A lot of theoretical models...

1. Procedural: Lexical phonology (Kiparsky, 1982), (Kiparsky 2000, Bermúdez-Otero prep)

Message – Which theory?

- Lexical Phonology vs Prosodic Phonology? Which do you pick?
Lexical Phonology vs Prosodic Phonology? Which do you pick?

A lot of answers:
1. either (Nesp or und Vogel, 1986)
2. only one (Kaisse, 1985)
3. both (Inkelas, 1989)
Message – Which theory?

- Lexical Phonology vs Prosodic Phonology? Which do you pick?
- A lot of answers:
  1. either (Nesp or und Vogel, 1986)
  2. only one (Kaisse, 1985)
  3. both (Inkelas, 1989)
- My answer?
  → Both!
  ? Because Armenian wants them merged
Background on Armenian

- Armenian is an Indo-European language
  - Standard Western Armenian (WA)
  - Standard Eastern Armenian (EA)
- Nominal morphology is suffixing & agglutinative
Background on Armenian

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  - Standard Western Armenian (WA)
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- Data from two dialects on stress & reduction
Background on Armenian

- Armenian is an Indo-European language
  - Standard Western Armenian (WA)
  - Standard Eastern Armenian (EA)
- Nominal morphology is suffixing & agglutinative
- Data from two dialects on stress & reduction
- Interactions will require:

<table>
<thead>
<tr>
<th>Lexical Phonology</th>
<th>Prosodic Phonology</th>
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<tbody>
<tr>
<td>Cyclicity</td>
<td>Misalignment</td>
</tr>
<tr>
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</table>
- **Introduction**
- **Stress Assignment**
- **Vowel reduction**
  - Phonology of reduction
  - Morphology of reduction
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  - Western = Lexical Phonology
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- **Coherent system**
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- **Conclusion**

- **Appendix**
WA and EA have stress fall on the rightmost full vowel in the morphological word (MWord)

(1) a. kórdz  ‘work’
Stress – Phonology

- WA and EA have stress fall on the rightmost full vowel in the morphological word (MWord)

\[(2) \quad \begin{align*}
    a. & \quad \text{kórdz} & \quad \text{‘work’} \\
    b. & \quad \text{kordz-avó́r} & \quad \text{‘worker’}
\end{align*} \]
Stress – Phonology

- WA and EA have stress fall on the rightmost full vowel in the morphological word (MWord)

\[(3)\]

a. kórdz  
   ‘work’

b. kordz-avór  
   ‘worker’

c. kordz-avor-nér  
   ‘workers’
WA and EA have stress fall on the rightmost full vowel in the morphological word (MWord)

(4)  a. kórdz  ‘work’
     b. kordz-avór  ‘worker’
     c. kordz-avor-nér  ‘workers’
     d. kordz-avor-nér-ə  ‘the workers’
Stress– Morphology

• It doesn’t matter if the rightmost full vowel is part of the a) root, b) derivational suffix, or c) inflectional suffix.

(5)  a. kórdz  ‘work’
     b. kordz-avór  ‘worker’
     c. kordz-avor-nér  ‘workers’
Stress–Morphology

- It doesn’t matter if the rightmost full vowel is part of the a) root, b) derivational suffix, or c) inflectional suffix.

(7) a. kórdz
    b. kordz-avór
    c. kordz-avor-nér

- ‘work’
- ‘worker’
- ‘workers’

- But, stress doesn’t fall on an enclitic

(8) a. kordz-avor-nér en
    b. kordz-avor-nér al
    c. kordz-avor-nér al en

- ‘(they) are workers’
- ‘also workers’
- ‘(they) are also workers’
Stress – Domain

- PWord is part of MWord that’s the stress-domain (Vogel, 2008; Nespor und Vogel, 1986)
  - MWord = PWord.

(9) \[ /\text{kordz-avor-ner} \{MW\ \text{en/} /kor\text>d-avor-ner} \{PW\ \text{en}\] ‘(they) are workers’

\[↓↓↓\]

\[/\text{kordz-avor-nér} \{PW\ \text{en}\]
Stress – Domain

- PWord is part of MWord that’s the stress-domain (Vogel, 2008; Nespor und Vogel, 1986)
  - MWord = PWord.

\[(10) \quad \text{/kordz-avor-ner\}_{MW \ en/} \quad \text{‘(they) are workers’} \]
\[\quad \quad \downarrow \downarrow \downarrow \]
\[\text{[kordz-avor-nér\}_{PW \ en]} \]

- All examples will be 1 MWord = 1 PWord
  - PWord boundaries won’t be placed
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Vowel reduction

- Stress is assigned and reassigned cyclically as each suffix is added.

Evidence = destressed high vowels reduce to nothing (or schw a).

(11) a. amus
   i
b. amus
   a

husband’
marital’
Vowel reduction

- Stress is assigned and reassigned cyclically as each suffix is added.
- Evidence = destressed high vowels reduce to nothing (or schwa).

(12)  

a. amusín  
    ‘husband’

b. amuṣn-agán  
    ‘marital’
Vowel reduction - phonological factors

- What reduces?
  1. high /i, u/
Vowel reduction - phonological factors

- What reduces?
  1. high /i, u/

(14) a. makúr
    makr-él
    makúr
    mk-él

    ‘clean’
    ‘to clean’
Vowel reduction - phonological factors

- What reduces?
  1. high /i, u/

\[(15)\] (a) makúr
    makur
    ma\texttt{kr-é}l
    ‘clean’
    ‘to clean’

(b) paž\texttt{î}n
    paž\texttt{în}
    pa\texttt{3n-é}l
    ‘section’
    ‘to divide’
Vowel reduction - phonological factors

- What reduces?
  1. high /i, u/

(16) a. makúr
    makkr-él
    ‘clean’
    ‘to clean’

b. pažín
   pažn-él
   ‘section’
   ‘to divide’

c. azád
   azad-él
   *azd-él
   ‘free’
   ‘to free’
Vowel reduction - phonological factors

• What reduces?
  1. high /i, u/
     ★ /uj/ → [u]

(17) a. kújn        ‘color’
    b. kun-ód       ‘colorful’
Vowel reduction - phonological factors

- What reduces?
- 1. high /i, u/
  - /uj/ → [u]

(19) a. kújn
    b. kun-ód

(20) a. garújts
    b. garu̯ts-él

‘color’
‘colorful’
‘building’
‘to build’
Vowel reduction - Phonology

- What reduces?
  1. high /i, u/
     - /uj/ $\rightarrow$ [u]
  2. de-stressed, not just un-stressed

(21) a. irígún
    b. irígn-anál

‘night’
‘to become night’
Vowel reduction - Phonology

• What reduces?
  1. high /i, u/
     ⋄ /uʃ/ → [u]
  2. de-stressed, not just un-stressed

(23) a. irigún  ‘night’
     b. irign-anál  ‘to become night’
     c. * irgun-anál  ‘to become night’
Vowel reduction - Phonology

- What reduces?
  1. high /i, u/
     - /uj/ → [u]
  2. de-stressed, not just un-stressed

(25) a. iriguñ  ‘night’
    b. iriguñ-anál  ‘to become night’
    c. * irguñ-anál  ‘to become night’

(26) a. amusín  ‘husband’
    b. amusn-utjun  ‘marriage’
Vowel reduction - Phonology

• What reduces?
  1. high /i, u/
     ★ /uj/ → [u]
  2. de-stressed, not just un-stressed

(27)  a. iriguń  ‘night’
      b. irign-anál  ‘to become night’
      c. * irgun-anál  ‘to become night’

(28)  a. amusín  ‘husband’
      b. amusn-utjún  ‘marriage’
      c. * amsin-utjún  ‘marriage’
Vowel reduction - Phonology

- What reduces?
  1. high /i, u/
     - /uj/ → [u]
  2. de-stressed, not just un-stressed

(29)  
  a. kijér  ‘night’
  b. kijer-ajín  ‘nocturnal’
VOWEL REDUCTION - PHONOLOGY

- What reduces?
  1. high /i, u/
     - /uj/ → [u]
  2. de-stressed, not just un-stressed

(31) a. kifér                ‘night’
    b. kischer-ajín           ‘nocturnal’
    c. * kisher-ajín          ‘nocturnal’
Vowel reduction - Phonology

• What reduces?
  1. high /i, u/
     ★ /uj/ → [u]
  2. de-stressed, not just un-stressed

(33) a. kíjer  ‘night’
    b. kíjer-ajín  ‘nocturnal’
    c. *kíjer-ajín  ‘nocturnal’

(34) a. darí  ‘year’
    b. darí-k  ‘age’
Vowel reduction - Phonology

- What reduces?
  1. high /i, u/
     ★ /uj/ → [u]
  2. de-stressed, not just un-stressed

(35) a. kifér  ‘night’
     b. kifér-ajín  ‘nocturnal’
     c. *kijer-ajín  ‘nocturnal’

(36) a. darí  ‘year’
     b. darí-k  ‘age’
     c. *dár-k  ‘age’
Vowel reduction - phonological factors

- What reduces?
  1. high /i, u/
     - /u/j → [u]
  2. de-stressed, not just un-stressed
  3. Reduce to ∅ OR @ to prevent onset cluster or (rising sonority) coda cluster

(37) a. barsíg  ‘Persian’
     b. barsg-astán  ‘Persia’
Vowel reduction - phonological factors

- What reduces?
  1. high /i, u/
     - /uj/ $\rightarrow$ [u]
  2. de-stressed, not just un-stressed
  3. Reduce to $\emptyset$ OR $\varnothing$ to prevent onset cluster or (rising sonority) coda cluster

(39) a. barsíg
     b. barsíg-astán

(40) a. kir
     b. *kr-íts
     c. kør-its

‘Persian’
‘Persia’
‘letter’
‘pen’
‘pen’
Vowel reduction - multiple applications

- Reduction is also cyclic and can apply multiple times

(41)  a.  lújš  ‘light’
Vowel reduction - multiple applications

- Reduction is **also** cyclic and can apply multiple times

(43)  
  a. lújs  
      ‘light’  
  b. lus-avór  
      ‘illuminous’
Vowel reduction - multiple applications

- Reduction is also cyclic and can apply multiple times

(45) a. lújs  
   b. lús-avór  
   c. lús-avor-íťʃ  

‘light’  
‘illuminous’  
‘illuminator’
Vowel reduction - multiple applications

- Reduction is also cyclic and can apply multiple times

(47) a. lújs  
    b. lus-avór  
    c. lus-avor-íťʃ  
    d. lus-avor-tʃ-agán  

'light'  
'illuminous'  
'illuminator'  
'Apostolic'
Vowel reduction - multiple applications

- Reduction is **also** cyclic and can apply multiple times

  (49)  
  a. **lújs**  
  b. **lus-avóř**  
  c. **lus-avor-íťʃ**  
  d. **lus-avor-ʈʃ-agán**

  ‘light’
  ‘illuminous’
  ‘illuminator’
  ‘Apostolic’

(50)  
  a. **dzín**

  ‘birth (of animal)’
- Reductio is also cyclic and can apply multiple times

\[(51)\]
\[
a. \text{lújs} \quad \text{‘light’} \\
\text{b. lus-avór} \quad \text{‘illuminous’} \\
\text{c. lus-avor-íť} \quad \text{‘illuminator’} \\
\text{d. lus-avor-ťą-agán} \quad \text{‘Apostolic’}
\]

\[(52)\]
\[
a. \text{dzín} \quad \text{‘birth (of animal)’} \\
\text{b. dzən-únt} \quad \text{‘birth’}\]
Vowel reduction - multiple applications

- Reduction is **also** cyclic and can apply multiple times

(53)  
  a.  lújs  
  b.  lus-avór  
  c.  lus-avor-íťʃ  
  d.  lus-avor-tʃ-ágán  

    ‘light’  
    ‘illuminous’  
    ‘illuminator’  
    ‘Apostolic’

(54)  
  a.  ðzín  
  b.  ðzən-únt  
  c.  ðzən-ənt-agán  

    ‘birth (of animal)’  
    ‘birth’  
    ‘generative’
Vowel reduction – Phono formalization

- Can formalize previous factors (Khanjian, 2009)
Vowel reduction – PHONO FORMALIZATION

- Can formalize previous factors (Khanjian, 2009)
  1. Destressed: comparative markedness or constraint conjunction (DEE)
Can formalize previous factors (Khanjian, 2009)

1. Destressed: comparative markedness or constraint conjunction (DEE)
2. Cyclicity: lexical phono’s strata
Vowel reduction – Phono formalization

- Can formalize previous factors (Khanjian, 2009)
  1. Destressed: comparative markedness or constraint conjunction (DEE)
  2. Cyclicity: lexical phono’s strata
- Ranking/elaboration in original source Khanjian (2009) + appendix
- Some holes need to be filled
Vowel reduction – morphology

- Not every destressed high vowel will reduce
Vowel reduction – morphology

- Not every destressed high vowel will reduce
- All suffixes trigger stress, but not all trigger reduction
- Derivation vs inflection split for triggers
- Dialectal difference on these triggers.
Vowel reduction - Derivation vs. Inflection

- In WA and EA, Der. triggers stress shift **AND** vowel reduction

  (55)  
  a. amusín  
  b. amusn-agán  
  ‘husband’  
  ‘marital’
Vowel reduction - Derivation vs. Inflection

- In WA and EA, Der. triggers stress shift AND vowel reduction

  (56)  
  a. amusín   ‘husband’
  b. amusn-agán   ‘marital’

- In WA and EA, Inf. causes stress shift but..
  - WA: Inf. doesn’t cause vowel reduction
  - EA: ...

  (57)  
  a. amusín-nér   ‘husband-PL’ (WA)
  b. amusín-óv   ‘husband-INSTR’ (WA)
In WA and EA, Der. triggers stress shift AND vowel reduction

(58) a. amusín  
     ‘husband’

     b. amusn-agán  
     ‘marital’

In WA and EA, Inf. causes stress shift but..

- **WA**: Inf. **doesn’t** cause vowel reduction
- **EA**: only V-initial Inf cause vowel reduction

(59) a. amusín-nér  
     ‘husband-PL’ (WA & EA)

     b. amusín-óv  
     ‘husband-INSTR’ (WA)

     c. amusn-óv  
     ‘husband-INSTR’ (EA)
Recap on data

- Phono: destressed high vowels reduce

Morpho: not all suffixes trigger reduction:

<table>
<thead>
<tr>
<th>Der. Inf. (C-initial)</th>
<th>Inf. (V-initial)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduction</td>
<td></td>
</tr>
<tr>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

- Both processes show cyclicity (repeat multiple times)

Theorizing:
1. WA $\rightarrow$ Lexical Phono (cyclicity & levels)
2. EA $\rightarrow$ above + Prosodic Phono (misalignment, P-constituents)
**Recap on data**

- **Phono**: destressed high vowels reduce
- **Morpho**: not all suffixes trigger reduction:

<table>
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<th>Morpho</th>
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<td><strong>Reduction</strong></td>
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<td>✓</td>
</tr>
<tr>
<td>✓</td>
<td>✓ (WA), ✓ (EA)</td>
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Recap on data

- Phono: destressed high vowels reduce
- Morpho: not all suffixes trigger reduction:

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- Both processes show cyclicity (repeat multiple times)
- Theorizing:
  1. WA → Lexical Phono (cyclicity & levels)
Recap on data

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- Both processes show cyclicity (repeat multiple times)
- Theorizing:
  1. WA → Lexical Phono (cyclicity & levels)
  2. EA → above + Prosodic Phono (misalignment, P-constituents)
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Focus on Western

- Ignore EA, morpho & phono line up neatly

<table>
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<tr>
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<th>Phono</th>
<th>Lexical Phono</th>
<th>Behavior</th>
</tr>
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<tbody>
<tr>
<td>Deriv.</td>
<td>Stress &amp; Reduc.</td>
<td>Stem (level 1)</td>
<td>Cyclic</td>
</tr>
<tr>
<td>Inf.</td>
<td>Stress</td>
<td>Word (level 2)</td>
<td>Post-cyclic</td>
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Focus on Western

- Ignore EA, morpho & phono line up neatly

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<td>Stress</td>
<td>Word (level 2)</td>
<td>Post-cyclic</td>
</tr>
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- Formalize:
  - Stem level: stress + reduction are turned ON (M→F)
  - Word level: reduction turned OFF (F→M)
### Lexical Phonology - Examples parade

<table>
<thead>
<tr>
<th>Level</th>
<th>Phono</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stem</td>
<td>Stress → Reduction</td>
</tr>
<tr>
<td>Word</td>
<td>Stress</td>
</tr>
</tbody>
</table>

#### Morphology

- **Input**: /amusin/
- **SLevel**: MW
- **WLevel**: MS
- **/amusin/**

#### Lexical Phonology

- **Input**: /amusin/
- **SLevel**: MW
- **WLevel**: MS
- **/amusin/**
- **P-Constituents**
### Lexical Phonology - Examples Parade

<table>
<thead>
<tr>
<th>Level</th>
<th>Phono</th>
<th>Stem Stress → Reduction</th>
<th>Word Stress</th>
</tr>
</thead>
</table>

#### Morphology

- **Input**: /amusin/
- **SLevel**: amusín
- **WLevel**:

#### Lexical Phonology

- **P-Constituents**
  - **PS**: amusín

#### Diagram

```
    MW  |  MS  | /amusin/
     |     |        
    Input  | SLevel  | amusín
    WLevel  |        |        
    P-Constituents  |        |        
    PS  |        | amusín
```
## Lexical Phonology - Examples parade

<table>
<thead>
<tr>
<th>Morphology</th>
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</tr>
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<tbody>
<tr>
<td><strong>MW</strong></td>
<td></td>
</tr>
<tr>
<td><strong>MS</strong></td>
<td></td>
</tr>
<tr>
<td>/amusín/</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Input</th>
<th>/amusín/</th>
</tr>
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<tbody>
<tr>
<td>SLevel</td>
<td>amusín</td>
</tr>
<tr>
<td>WLevel</td>
<td>amusín</td>
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<table>
<thead>
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<tbody>
<tr>
<td>PW</td>
</tr>
<tr>
<td>PS</td>
</tr>
<tr>
<td>amusín</td>
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### Morphology

- **MW**
  - **MS**
    - **MS**
    - **Der**
    - /amusin/ -agan

### Lexical Phonology

- **Input** /amusin-agan/
- **SLevel**
- **WLevel**

- **P-Constituents**
Lexical Phonology - Examples parade

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**Morphology**

MW

<table>
<thead>
<tr>
<th>MS</th>
</tr>
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<tbody>
<tr>
<td>MS</td>
</tr>
<tr>
<td>/amusin/</td>
</tr>
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**Lexical Phonology**

Input /amusin-agan/

SLevel amusín

WLevel

P-Constituents

PS

amusín
Lexical Phonology - Examples parade

<table>
<thead>
<tr>
<th>Level</th>
<th>Phono</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stem</td>
<td>Stress $\rightarrow$ Reduction</td>
</tr>
<tr>
<td>Word</td>
<td>Stress</td>
</tr>
</tbody>
</table>

Morphology

Input /amusin-agan/
SLevel amu$sn$-agán
WLevel

Lexical Phonology

P-Constituents

amu$sn$ -agán
Lexical Phonology - Examples parade

<table>
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<tr>
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<tbody>
<tr>
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<tr>
<td>Word</td>
<td>Stress</td>
</tr>
</tbody>
</table>

Morphology

MW

\[ MS \]

\[ MS \] \[ Der \]

\[ /amusin/ \] \[ /-agan/ \]

Lexical Phonology

Input \(/amusin-agan/\)

SLevel \( amu\textbf{sn}-agán \)

WLevel \( amu\textbf{sn}-agán \)

P-Constituents

PW

PS

\[ amu\textbf{sn} \] \[ -agán \]
Lexical Phonology - Examples parade

<table>
<thead>
<tr>
<th>Level</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Stem</td>
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</tr>
<tr>
<td>Word</td>
<td>Stress</td>
</tr>
</tbody>
</table>

Morphology

- MW
- MS
- Inf

Input /amusin-ov/
SLLevel
WLevel

Lexical Phonology

P-Constituents
Lexical Phonology - Examples parade

<table>
<thead>
<tr>
<th>Level</th>
<th>Phono</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stem</td>
<td>Stress → Reduction</td>
</tr>
<tr>
<td>Word</td>
<td>Stress</td>
</tr>
</tbody>
</table>

**Morphology**

- **MW**
  - **MS**
    - **Inf**
      - /amusin/ - ov

**Lexical Phonology**

- **Input** /amusin-ov/
- **SLevel** amusín
- **WLevel**

**P-Constituents**

- **PS**
  - amusín
Lexical Phonology - Examples Parade

<table>
<thead>
<tr>
<th>Level</th>
<th>Phono</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stem</td>
<td>Stress → Reduction</td>
</tr>
<tr>
<td>Word</td>
<td>Stress</td>
</tr>
</tbody>
</table>

Morphology

Input /amusin-ov/  
SLevel amusín  
WLevel amusin+óv

Lexical Phonology

MW

MS /amusin/  
Inf /-ov/  
P-Constituents

PW

PS  
amusin +óv
Lexical Phonology - Examples parade

<table>
<thead>
<tr>
<th>Level</th>
<th>Phono</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stem</td>
<td>Stress → Reduction</td>
</tr>
<tr>
<td>Word</td>
<td>Stress</td>
</tr>
</tbody>
</table>

Morphology

<table>
<thead>
<tr>
<th>MW</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MS</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Der</td>
</tr>
</tbody>
</table>

Input /lujs-avor-itʃ-agan/

SLLevel

WLevel

P-Constituents
Lexical Phonology - Examples parade

<table>
<thead>
<tr>
<th>Level</th>
<th>Phono</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stem</td>
<td>Stress → Reduction</td>
</tr>
<tr>
<td>Word</td>
<td>Stress</td>
</tr>
</tbody>
</table>

**Morphology**

- MW
- MS
  - MS
    - MS
      - MS
        - Der
          - /lujs/  
        - Der
          - /-avor/ 
        - Der
          - /-itʃ/  
        - Der
          - /-agan/ 

**Lexical Phonology**

- Input: /lujs-avor-itʃ-agan/
- SLevel: új's
- WLevel: új's

**P-Constituents**

- PS: új's
Lexical Phonology - Examples parade

<table>
<thead>
<tr>
<th>Level</th>
<th>Phono</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stem</td>
<td>Stress (\rightarrow) Reduction</td>
</tr>
<tr>
<td>Word</td>
<td>Stress</td>
</tr>
</tbody>
</table>

**Morphology**

- **MW**
  - **MS**
    - **MS**
      - **MS**
        - **Der**
          - **/lujs/**
        - **Der**
          - **/-avor/**
        - **Der**
          - **/-iʃ/**
        - **Der**
          - **/-agan/**

**Lexical Phonology**

- **Input**
  - **/lujs-avor-iʃ-agan/**
- **SLevel**
  - **lus-avóř**
- **WLevel**

**P-Constituents**

- **PS**
  - **lus-avóř**
Lexical Phonology - Examples parade

<table>
<thead>
<tr>
<th>Level</th>
<th>Phono</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
<tr>
<td>Word</td>
<td>Stress</td>
</tr>
</tbody>
</table>

Morphology

Lexical Phonology

Input /lujs-avor-itʃ-agan/
SLevel lus-avor-itʃ
WLevel

P-Constituents

/lus-avor-itʃ/
**Lexical Phonology - Examples parade**

<table>
<thead>
<tr>
<th>Level</th>
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<tbody>
<tr>
<td>Stem</td>
<td>Stress $\rightarrow$ Reduction</td>
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<tr>
<td>Word</td>
<td>Stress</td>
</tr>
</tbody>
</table>

### Morphology

- **MW**
- **MS**
  - **MS**
    - **MS**
      - **MS**
        - **Der**
          - **Der**
            - **Der**
              - **lujs/**
              - **-avor/**
              - **-itʃ/**
              - **-agan/**

### Lexical Phonology

- **Input** /lujs-avor-itʃ-agan/
- **SLevel** lus-avor-티어-agán
- **WLevel**

### P-Constituents

- **PS**
  - **lus-avor-티어-agán**
Lexical Phonology - Examples parade

<table>
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<th>Phono</th>
</tr>
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<tbody>
<tr>
<td>Stem</td>
<td>Stress</td>
</tr>
<tr>
<td></td>
<td>→ Reduction</td>
</tr>
<tr>
<td>Word</td>
<td>Stress</td>
</tr>
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</table>

**Morphology**

**Lexical Phonology**

Input /lujs-avor-itʃ-agan/

SLevel lus-avor-ʃ-اغان

WLevel lus-avor-ʃ-اغان

P-Constituents

PW

PS

lus-avor-ʃ-اغان

MW

MS

MS

MS

/lujs/ -avor/ -itʃ/ -agan/
Lexical Phonology – End of Parade

- Lexical phono is enough for WA
  1. Stem vs Word
  2. Unbounded cycles
  3. morphology & phonology match
Lexical Phonology – end of parade

- Lexical phono is enough for WA
  1. Stem vs Word
  2. Unbounded cycles
  3. morphology & phonology match
- What about EA?
  → Prosodic Misalignment!
Dialectal difference

- Dialect difference is morphology of reduction
- Derivation: trigger stress AND reduction in WA & EA

(60) a. amusíñ ‘husband’
    b. amusn-agán ‘marital’

- Inflection: ...
**Dialectal difference - Inflection**

- Inflection triggers stress in WA & EA but...
  - **WA**: doesn’t trigger reduction (61b,62b)
  - **EA**: ...

(61)  
  a. amusín  
  b. amusín-nér  

‘husband’  
‘husband-PL’ (WA)

(62)  
  a. amusín  
  b. amusín-óv

‘husband’  
‘husband-INSTR’ (WA)
Dialectal difference - Inflection

- Inflection triggers stress in WA & EA but...
  - WA: doesn’t trigger reduction (63,64b)
  - EA: only V-initial suffixes trigger reduction (63,64c)

(63) a. amusín
     b. amusín-nér

(64) a. amusín
     b. amusín-óv
     c. amusn-óv
Dialect difference – what happened?

- Where was reduction?

<table>
<thead>
<tr>
<th>Dialect</th>
<th>Der</th>
<th>Inf. (V-initial)</th>
<th>Inf. (C-initial)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WA</td>
<td>✓</td>
<td>✗</td>
<td>✗</td>
</tr>
</tbody>
</table>
Dialect difference – what happened?

- Where was reduction?

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</thead>
<tbody>
<tr>
<td>WA</td>
<td>✓</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>EA</td>
<td>✓</td>
<td>✓</td>
<td>✗</td>
</tr>
</tbody>
</table>

- What happened?
## Dialect difference – what happened?

- Where was reduction?

<table>
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<th>Inf. (V-initial)</th>
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<tr>
<td>WA</td>
<td>✓</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>EA</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

- What happened?

→ EA V-initial is morphologically SLevel but causes SLevel phono

- How? Why?
Dialect difference – what happened?

- Where was reduction?

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<th>Dialect</th>
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<th>Inf. (V-initial)</th>
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</thead>
<tbody>
<tr>
<td>WA</td>
<td>✓</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>EA</td>
<td>✓</td>
<td>✓</td>
<td>✗</td>
</tr>
</tbody>
</table>

- What happened?

→ EA V-initial is morphologically SLevel but causes SLevel phono

- How? Why?

→ Misalignment: Eastern PStem respects syllable boundaries, WA doesn’t
Dialect difference - PStem variation

- Alignment Constraints:
  - ALIGN-PS-MS = PStem aligns with MStem
  - ALIGN-PS-σ = PStem aligns with end of syllable

- How to capture dialect variation in PStem size?
Dialect difference - PStem variation

- Alignment Constraints:
  - **ALIGN-PS-MS** =
    PStem aligns with MStem
  - **ALIGN-PS-\(\sigma\)** =
    PStem aligns with end of syllable

- How to capture dialect variation in PStem size?
  - **WA?** ALIGN-PS-MS » ALIGN-PS-\(\sigma\):
    Better to align with MStem than with syllable boundaries
  - **EA?** ALIGN-PS-\(\sigma\) » ALIGN-PS-MS:
    Better to align with syllable boundaries than with MStem
PStems - Alignment with Der

- Boundaries:
  1. $\{\}_m$ for MStems
  2. $(\,\,\,)_p$ for PStems

- In WA & EA, Der. triggers reduction.

  1. $\{ (amus\vec{i}n)_p + /agan/ \}_m$
  2. $(amus\textbf{sn}-ag\acute{a}n)_p$

**General Armenian (WA or EA)**

| $\{ (amus\vec{i}n)_p + /agan/ \}_m$ | ALIGN-PS-MS | ALIGN-PS-$\sigma$
|-------------------------------------|--------------|-----------------
| a. (amus\textbf{i}.n)_p-ag\acute{a}n |              | *!            |
| b. (amus\textbf{sn}-ag\acute{a}n)_p |              |              |
| c. (amus\textbf{i}.)_p n-ag\acute{a}n | *!          |              |
PStems - Alignment with C-initial inf.

- Boundaries:
  1. \(\{\}\_m\) for MStems
  2. \(()_p\) for PStems

- In WA & EA, C-initial Inf doesn’t trigger reduction
  1. \(\{\text{amusíin}\}_p\)_m + /ner/
  2. \(\text{amusín}_p\)-nér

**General Armenian (WA or EA)**

<table>
<thead>
<tr>
<th></th>
<th>ALIGN-PS-MS</th>
<th>ALIGN-PS-σ</th>
</tr>
</thead>
<tbody>
<tr>
<td>({\text{amusíin}}_p)_m + /ner/</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. (\text{amusín}_p)-nér</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. (\text{amusn}_p)-nér</td>
<td></td>
<td>*!</td>
</tr>
</tbody>
</table>
• V-initial Inf. doesn’t trigger reduction in WA

1. \(\{ (\text{amus} \hat{i}\text{n})_p \}_m + /-ov/\)
2. \((\text{amus} \hat{i}\text{n})_p-\hat{o}v\) (WA)

<table>
<thead>
<tr>
<th>((\text{amus} \hat{i}\text{n})_p }_m + /-ov/)</th>
<th>ALIGN-PS-MS</th>
<th>ALIGN-PS-(\sigma)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. ((\text{amus} \hat{i}\text{n})_p-\hat{o}v)</td>
<td></td>
<td>(\star)</td>
</tr>
<tr>
<td>b. ((\text{amus} \hat{i}\text{n})_p-\hat{o}v)</td>
<td></td>
<td>(\star)!</td>
</tr>
</tbody>
</table>
**PStems - Misalignment with V-initial inf.**

- V-initial Inf. doesn’t trigger reduction in WA
  1. \{ (amusíñ)_{p} \}_{m} + /-ov/ 
  2. (amusíñ)_{p}-óv (WA)

<table>
<thead>
<tr>
<th></th>
<th>ALIGN-PS-MS</th>
<th>ALIGN-PS-σ</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. (amusíñ)_{p}-óv</td>
<td></td>
<td>!</td>
</tr>
<tr>
<td>b. (amusíñ)_{p}-óv</td>
<td></td>
<td>!</td>
</tr>
</tbody>
</table>

- But it does in EA
  1. (amusíñ)_{p}-óv (EA)

<table>
<thead>
<tr>
<th></th>
<th>ALIGN-PS-σ</th>
<th>ALIGN-PS-MS</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. (amusíñ)_{p}-óv</td>
<td>!</td>
<td></td>
</tr>
<tr>
<td>b. (amusíñ)_{p}-óv</td>
<td>!</td>
<td>!</td>
</tr>
</tbody>
</table>
What system does the data need

1. Morphology: derivation (MStem) vs inflection (MWords)
2. Cophonology: SLevel vs WLevel phono for different morphologies
3. Unbounded conversion: Converting MS to PF is iterative
4. P-constituents: Converting M to P creates PStems, PWords
5. Misalign cyclicity: P-constituents can misalign (in EA) and trigger larger and/or more cycles

Western

```
 /džin/ /-unt/ /-i/
```

Eastern

```
 /džin/ /-unt/ /-i/
```
What system does the data need

1. Morphology: derivation (MStem) vs inflection (MW ords)
2. Cophonology: SLevel vs WLevel phono for different morphologies
3. Unbounded conversion: Converting MS to PF is iterative
4. P-constituents: Converting M to P creates PStems, PWords
5. Misalign cyclicity: P-constituents can misalign (in EA) and trigger larger and/or more cycles

Western

```
MW /
MS /
MS
```

```
(dzìn)ps/-unt/-i/
```

Eastern

```
MW /
MS /
MS
```

```
(dzìn)ps/-unt/-i/
```
What system does the data need

1. **Morphology**: derivation (MStem) vs inflection (MWords)
2. **Cophonology**: SLevel vs WLevel phono for different morphologies
3. **Unbounded conversion**: Converting MS to PF is iterative
4. **P-constituents**: Converting M to P creates PStems, PWords
5. **Misalign cyclicity**: P-constituents can misalign (in EA) and trigger larger and/or more cycles

![Diagram showing Western and Eastern morphological structures]

Western

- **MW**
  - **MS**
    - **Der**
      - **Inf**
        - (dzən -únt)_{ps} /-i/

Eastern

- **MW**
  - **MS**
    - **Der**
      - **Inf**
        - (dzən -únt)_{ps} /-i/
What system does the data need

1. **Morphology**: derivation (MStem) vs inflection (MWords)
2. **Cophonology**: SLevel vs WLevel phono for different morphologies
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Western

```
            MW
           /\    \      \\
          /  \   \     \\
         MS   Der  Inf
       /\         |     |
      /   \       |     |
     (dzën   -únt)ps -i
```

Eastern

```
            MW
           /\    \      \\
          /  \   \     \\
         MS   Der  Inf
       /\         |     |
      /   \       |     |
     (dzën   -únt)ps -i
```
What system does the data need

1. **Morphology**: derivation (MStem) vs inflection (MWords)
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Western | Eastern
---|---
**MW**
**MS**
**MS**
**Der**
**Inf**

(\(\ddot{dz\text{\o}n} \ -\dot{\text{\u{n}.t}}\))\(_{ps}\)

-i

(\(\ddot{dz\text{\o}n} \ -\dot{\text{\u{n}.t}}\ -i\))\(_{ps}\)
What system does the data need

1. **Morphology**: derivation (MStem) vs inflection (MWords)
2. **Cophonology**: SLevel vs WLevel phono for different morphologies
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5. **Misalign cyclicity**: P-constituents can misalign (in EA) and trigger larger and/or more cycles

Western

```
  MW
 / \  /
 MS  Der Inf
 /  /  /
(dzən) (dzən) (dzən)
```

Eastern

```
  MW
 / \  /
 MS  Der Inf
 /  /  /
( ön.t) ( ön.t) ( ön.t)
```

Hossef Dolyian (SBU)
What system does the data need

1. **Morphology**: derivation (MStem) vs inflection (MWords)
2. **Cophonology**: SLevel vs WLevel phono for different morphologies
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4. **P-constituents**: Converting M to P creates PStems, PWords
5. **Misalign cyclicity**: P-constituents can misalign (in EA) and trigger larger and/or more cycles

Western

```
MS
 | MS
 | Der
 | Inf
 | ( (dzən -un.t)ps -i)pw
```

Eastern

```
MS
 | MS
 | Der
 | Inf
 | ( (dzən -en.t -i)ps )pw
```
Summary

- Description of Armenian:
Summary

• Description of Armenian:
  1. lexical processes (stress & reduction)
  2. dialect variation (dang Eastern)

• Theoretical
SUMMARY

• Description of Armenian:
  1. lexical processes (stress & reduction)
  2. dialect variation (dang Eastern)

• Theoretical
  1. Lexical Phono is needed for unbounded cyclicity + Stem/Word
  2. Prosodic Phono is needed for misalignment
  3. Host of other constraints
**Summary**

- **Description of Armenian:**
  1. lexical processes (stress & reduction)
  2. dialect variation (dang Eastern)

- **Theoretical**
  1. Lexical Phono is needed for unbounded cyclicity + Stem/Word
  2. Prosodic Phono is needed for misalignment
  3. Host of other constraints

- **Takeway:**
  $\rightarrow$ representation+procedure = morpho-phonology
REFERENCES


[Creemers u. a. 2018] CREEMERS, Ava; DON, Jan; FENDER, Paula: Some affixes are roots, others are heads. In: Natural Language & Linguistic Theory 36 (2018), Nr. 1, S. 45–84


Table of Contents

- Introduction
- Stress Assignment
- Vowel reduction
  - Phonology of reduction
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- Derivation-Inflection divide
  - Western = Lexical Phonology
  - Eastern = Lexical + Prosodic Phonology
- Coherent system
- Conclusion
- Appendix
Feel free to ask about

1. Is the schwa epenthetic? (64)
2. Are feet useful (69)
3. Destressing constraints (73)
4. Why destressing and alternatives (82)
5. Why strata instead of Output-Output constraints? (86)
6. How about phases? (92)
Epenthetic schwa?

- Reduce to schwa if unsyllabifiable CC clusters, otherwise delete

(65)  
  a. barsīg  
    ‘Persian’  
  b. bars̱g-astán  
    ‘Persia’

(66)  
  a. kī₁r  
    ‘letter’  
  b. *kr-ǐtʃ  
    ‘pen’  
  c. kə₁r-ǐtʃ  
    ‘pen’
**Epenthetic schwa?**

- Reduce to schwa if unsyllabifiable CC clusters, otherwise delete

\[(67)\]
- a. barsíg
  - ‘Persian’
- b. barsg-astán
  - ‘Persia’

\[(68)\]
- a. ki₁r
  - ‘letter’
- b. *kr-íťʃ
  - ‘pen’
- c. ko₁r-íťʃ
  - ‘pen’
- d. ko₂r-íťʃ
  - ‘pen’
**Epenthetic schwa?**

- Reduce to schwa if unsyllabifiable CC clusters, otherwise delete

(69)  
  a. barsíg  
  b. barsg-astán  

(70)  
  a. kí₁r  
  b. *kr-íťʃ  
  c. kə₁r-íťʃ  
  d. kə₂r-íťʃ  

- Maybe deletion and epenthesis?
CC clusters in borrowed words have epenthetic schwa

Native words repair clusters via schwa

(71) a. təraktor  
     b. təram  
     ‘tractor’  
     ‘money’ (<drakhma)

Generally don’t have alternations schwa except before final appendix:

(72) a. pokər  
     b. pokr-er  
     ‘small’  
     ‘small ones’
Not the same process - sibilants

- Schwa epenthesis and Vowel reduction don’t have same output
- Initial sT/sD has prothesis, but vowel reduction is different

(73)  
- a. *skal  
  b. əskal  
  ‘to feel’
Not the same process - sibilants

- Schwa epenthesis and Vowel reduction don’t have same output
- initial sT/sD has prothesis, but vowel reduction is different

(75)  
  a. *skal  ‘to feel’
  b. əskal  ‘to feel’

(76)  
  a. súk  ‘mourning’
  b. *sk-ál  ‘to mourn’
  c. *əsk-ál  ‘to mourn’
  d. sək-ál  ‘to mourn’
Orthography generally doesn’t mark schwas:

(77)  
   a. barsíg  ‘Persian’
   b. [barsg-astáñ]  ‘Persia’
   c. <barsg-astáñ>  ‘Persia’
Not the same process — nonce words

- Orthography generally doesn’t mark schwas:

  (79)  
  a. barsīg  
  b. [barsg-astán]  
  c. <barsg-astán>  

  (80)  
  a. kī₁r  
  b. [kə₁r-ītf]  
  c. <kr-ītf>
Not the same process – nonce words

- Gave speakers nonce base-derivative pairs in orthography
- Reduced schwa pronounced based on original high vowel position

\[(81)\]

a. \(<\text{hamilt}>\quad <\text{hamltagan}>\)

b. \([\text{hamílt}]\quad [\text{haməlt-agán}]\)
Not the same process – nonce words

- Gave speakers nonce base-derivative pairs in orthography
- Reduced schwa pronounced based on original high vowel position

(83)  
  a.  \( <\text{hamilt}> \)  \( <\text{hamltagán}> \)  
  b.  \( [\text{hamílt}] \)  \( [\text{haməlt-agán}] \)

(84)  
  a.  \( <\text{hamlit}> \)  \( <\text{hamltagán}> \)  
  b.  \( [\text{hamlít}] \)  \( [\text{hamlət-agán}] \)
Can feet help?

- No
CAN FEET HELP?

- No
- Primary stress is always rightmost full vowel (word-final iamb)

(86)  a. (kórdz)  ‘work’
Can feet help?

- No
- Primary stress is always rightmost full vowel (word-final iamb)

(87)  
\begin{align*}
a. & \text{(kðrdz)} \quad \text{‘work’} \\
b. & \text{kor(dz-avór)} \quad \text{‘worker’}
\end{align*}
Can feet help?

- No
- Primary stress is always rightmost full vowel (word-final iamb)

(88)  
  a. (kôrdz)  ‘work’
  b. kor(dz-avóř)  ‘worker’
  c. kordz-a(vor-néř)  ‘workers’
Can feet help?

- No
- Primary stress is always rightmost full vowel (word-final iamb)
  
  \[(89)\]
  
  a. \(\text{kôrdz}\)  \(\text{‘work’}\)
  b. \(\text{kor(\tilde{d}z-avór)}\)  \(\text{‘worker’}\)
  c. \(\text{kordz-a(vor-né\text{r)}}\)  \(\text{‘workers’}\)
  d. \(\text{kordz-a(vor-né)r-œ}\)  \(\text{‘the workers’}\)

- No iterative secondary stress and very un-iambic behavior (Özçelik, 2017)
Can feet help?

- Stress shifter can be 1 or 2 syllables long

(90)  a. (makúr) ‘clean (adj)’
Can feet help?

- Stress shifter can be 1 or 2 syllables long

(92)  
  a. (makúr) ‘clean (adj)’
  b. (makr-él) ‘to clean’
Can feet help?

- Stress shifter can be 1 or 2 syllables long

(94) a. (makúr) ‘clean (adj)’
   b. (makr-él) ‘to clean’
   c. mak(r-utjún) ‘cleaning (n)’
Can feet help?

- Stress shifter can be 1 or 2 syllables long

(96)  
  a. \( \text{makúr} \)  
      ‘clean (adj)’
  b. \( \text{makr-él} \)  
      ‘to clean’
  c. \( \text{mak(r-utjún)} \)  
      ‘cleaning (n)’

- Same for reduction to schwa

(97)  
  a. \( \text{kír} \)  
      ‘letter’
Can feet help?

- Stress shifter can be 1 or 2 syllables long

  (98)  
  a. (makúr)  
  b. (makr-él)  
  c. mak(r-utjún)  
  ‘clean (adj)’
  ‘to clean’
  ‘cleaning (n)’

- Same for reduction to schwa

  (99)  
  a. (kír)  
  b. (kər-él)  
  ‘letter’
  ‘to write’
Can feet help?

- Stress shifter can be 1 or 2 syllables long

  \[(100)\]  
  a. (makúr) \hspace{1cm} ‘clean (adj)’  
  b. (makr-él) \hspace{1cm} ‘to clean’  
  c. mak(r-utjún) \hspace{1cm} ‘cleaning (n)’

- Same for reduction to schwa

  \[(101)\]  
  a. (kír) \hspace{1cm} ‘letter’  
  b. (kər-él) \hspace{1cm} ‘to write’  
  c. kə(r-utjún) \hspace{1cm} ‘writing (n)’
Can feet help?

- Rule: reduce a high vowel that’s no longer head of a foot

  (102)  
  a.  (makúr)  ‘clean (adj)’  
  b.  * ma(kur-él)  ‘to clean’  
  c.  → (makr-él)  ‘to clean’

- But...
Can feet help?

- Rule: reduce a high vowel that’s no longer head of a foot

(104)  
  a. (makúr)  
  b. * ma(kur-éél)  
  c. → (makr-él)

‘clean (adj)’

‘to clean’

But... same effects as destressing

Need similar DEE machinery because stress+feet aren’t in UR of input but are intermediate forms
**Can feet help?**

- Rule: reduce a high vowel that’s no longer head of a foot
  
  (106)  
  a.  (makúr)  
  b.  * ma(kur-él)  
  c.  → (makr-él)

  ‘clean (adj)’
  ‘to clean’
  ‘to clean’

- But... same effects as destressing
- Need similar DEE machinery because stress+feet aren’t in UR of input but are intermediate forms
- And again, it’s not just any high vowel...

(107)  
a.  i(rigún)  
   b.  * irigun(n-anál)  
   c.  → irign-anál)

‘evening’
‘to become evening’
‘to become evening’
Can feet help?

- Still need to have Der vs. Inf split

(108) a. (pa3ín) ‘section’
Can feet help?

- Still need to have Der vs. Inf split

\[(110)\]

a. \((pa\tilde{n})\)  
   \(\text{‘section’}\)

b. \(*\ pa(\tilde{n}-\tilde{e}\ell)\)  
   \(\text{‘to separate’}\)
Can feet help?

- Still need to have Der vs. Inf split

(112)  

a. (pa3ín)  ‘section’

b. * pa(3in-él)  ‘to separate’

c. (pa3n-él)  ‘to separate’
Can feet help?

- Still need to have Der vs. Inf split

(114) a. (pa₃in) \quad \text{`section’}
b. * pa(3in-él) \quad \text{`to separate’}
c. (pa₃n-él) \quad \text{`to separate’}
d. pa(3in-nér) \quad \text{`section-PL’}
Can feet help?

- Still need to have Der vs. Inf split

  (116)  
  a. (pa3ín)  
  b. * pa(3in-é)  
  c. (pa3n-é)  
  d. pa(3in-nér)

- and Inf can stack up with no effect

  (117)  
  a. pa3in-(ner-óv)  

  ‘section’

  ‘to separate’

  ‘to separate’

  ‘section-PL’

  ‘section-PL-INSTR’
Stress – Formalize

- **Stress placement:** *ə » ALIGN-STR-R » ALIGN-STR-L* (Gordon, 2002)

<table>
<thead>
<tr>
<th>ajxar-ə</th>
<th>*ə</th>
<th>ALIGN-STR-R</th>
<th>ALIGN-STR-L</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. ╜ aʃxár-ə</td>
<td>*</td>
<td>**</td>
<td></td>
</tr>
<tr>
<td>b. áʃxar-ə</td>
<td>**!</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. ajxar-ə</td>
<td>*!</td>
<td></td>
<td>**</td>
</tr>
</tbody>
</table>
**Stress – Formalize**

- **Stress placement:** *ə « ALIGN-STR-R » ALIGN-STR-L (Gordon, 2002)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>ALIGN-STR-R</th>
<th>ALIGN-STR-L</th>
</tr>
</thead>
<tbody>
<tr>
<td>aʃxar-ə</td>
<td>*ə</td>
<td>*</td>
<td>**</td>
</tr>
<tr>
<td>a. aʃxár-ə</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. áʃxar-ə</td>
<td></td>
<td>**!</td>
<td></td>
</tr>
<tr>
<td>c. aʃxar-ə</td>
<td>*!</td>
<td></td>
<td>**</td>
</tr>
</tbody>
</table>

- **Word-level stress:** Undominated ALIGN(PW,R,MW,R)

<table>
<thead>
<tr>
<th></th>
<th>ALIGN(PW,R,MW,R)</th>
</tr>
</thead>
<tbody>
<tr>
<td>kordz}MW e</td>
<td></td>
</tr>
<tr>
<td>a. kórtdz}PW e</td>
<td></td>
</tr>
<tr>
<td>b. kórdz é}PW</td>
<td>*</td>
</tr>
</tbody>
</table>
Vowel reduction – phono formalization

- Can formalize previous factors (Khanjian, 2009)
Vowel reduction – phono formalization

- Can formalize previous factors (Khanjian, 2009)
- 1. Destressed: comparative markedness (DEE) for stress
Can formalize previous factors (Khanjian, 2009)

1. Destressed: comparative markedness (DEE) for stress
2. High: MAX indexed to [+HIGH]
Vowel reduction – phono formalization

- Can formalize previous factors (Khanjian, 2009)
  1. Destressed: comparative markedness (DEE) for stress
  2. High: MAX indexed to [+HIGH]
  3. Diphthong and chain shift: Distantional faithfulness
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  1. Destressed: comparative markedness (DEE) for stress
  2. High: MAX indexed to [+HIGH]
  3. Diphthong and chain shift: Distential faithfulness
  4. Deletion vs. schwa: *CompOnset, *ə, MAX indexed to moras
Vowel reduction – phono formalization

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- 5. Methathesis: LINEARITY
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  5. Methathesis: LINEARITY
  6. Cyclicity: lexical phono’s strata ;)

[9x251]Vowel reduction phono formalization

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  4. Deletion vs. schwa: *CompOnset, *ə, MAX indexed to moras
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  6. Cyclicity: lexical phono’s strata ;)

Ranking/elaboration in original source Khanjian (2009)

Some holes need to be filled

Hossef Dolatian (SBU) March 24, 2018
Vowel reduction – phono formalization

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  1. Destressed: comparative markedness (DEE) for stress
  2. High: MAX indexed to [+HIGH]
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  6. Cyclicity: lexical phono’s strata ;)
- Ranking/elaboration in original source Khanjian (2009)
- Some holes need to be filled
Formalizing reduction – Stress shift

- $^\exists$ ALIGN-STR-R: Stress is on rightmost full vowel
- $^N_V$-stress: no (non-schwa) vowels that were stressed but not anymore (destressed)
- $^O_V$-stress: no (non-schwa) vowels that were never stressed (unstressed)

<table>
<thead>
<tr>
<th>[urax] + /anál/</th>
<th>ALL-STR-R</th>
<th>$^*NV$-stress</th>
<th>$^*OV$-stress</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. uráx-anal</td>
<td></td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>b. uráx-anal</td>
<td>*!</td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>
**Formalizing reduction – Destressed reduction**

- \( *_{N}V[-\text{stress}] \): no (non-schwa) vowels that were stressed but not anymore (destressed)
- \( *_{O}V[-\text{stress}] \): no (non-schwa) vowels that were never stressed (unstressed)
- \( \text{MAX}[-\text{HIGH}] \): do not delete non-HIGH vowels
- \( \text{MAX}[+\text{HIGH}] \): do not delete high vowels

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a. makur-él</td>
<td></td>
<td>*!</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| b. makr-él  |            |              |            | *            | *

Hossep Dola tian (SBU)  March 24, 2018
**Formalizing reduction – Not low vowels**

- \( ^*_{NV} [-\text{stress}] \): no (non-schwa) vowels that were stressed but not anymore (destressed)
- \( ^*_{OV} [-\text{stress}] \): no (non-schwa) vowels that were never stressed (unstressed)
- \( \text{MAX}[-\text{HIGH}] \): do not delete non-HIGH vowels
- \( \text{MAX}[+\text{HIGH}] \): do not delete high vowels

<table>
<thead>
<tr>
<th>([uráx]+/anal/)</th>
<th>MAX[-HIGH]</th>
<th>( ^*_{NV} [-\text{stress}] )</th>
<th>MAX[+HIGH]</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. urax-anál</td>
<td></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>b. urx-anál</td>
<td>*!</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Formalizing reduction – Schwa

- \(*_{NV}[-\text{stress}]*\): no (non-schwa) vowels that were stressed but not anymore (destressed)
- \(\text{MAX}[-\text{HIGH}]*\): do not delete non-HIGH vowels
- \(\text{MAX}[+\text{HIGH}]*\): do not delete high vowels
- \(*_{\text{CompOnset}}*\): no complex onset (undominated)
- \(\text{MAX-}\mu[-[+\text{HIGH}]]*: high vowel do not lose a mora (=reduce to schwa)

<table>
<thead>
<tr>
<th>[3ɔyovúrt]+/agan/</th>
<th>*CompOnset</th>
<th>*NV[-stress]</th>
<th>*(\varepsilon)</th>
<th>MAX-(\mu)[+HIGH]</th>
<th>MAX [+HIGH]</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. 3ɔyovurt-agán</td>
<td></td>
<td>*!</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. 3ɔyovərt-agán</td>
<td></td>
<td></td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>c. 3ɔyovrт-agán</td>
<td>*!</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Formalizing reduction – Metathesis**

- \(*_N V[-\text{stress}]\): no (non-schwa) vowels that were stressed but not anymore (destressed)
- \(\text{MAX [+HIGH]}\): do not delete high vowels
- Linearity: do not change underlying precedences
- \(*r\varepsilon\): no \(r\varepsilon\) sequences

<table>
<thead>
<tr>
<th>[dʒəʃk.ríd]-/utjun/</th>
<th>(*r\varepsilon)</th>
<th>(*V[-\text{stress}])</th>
<th>Linearity</th>
<th>(\text{MAX-}\mu[+\text{HIGH}])</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. dʒəʃk.ríd-utjún</td>
<td>(*)</td>
<td>(*)</td>
<td>()</td>
<td>()</td>
</tr>
<tr>
<td>b. dʒəʃk.réd-utjún</td>
<td>(*)</td>
<td>()</td>
<td>(*)</td>
<td>()</td>
</tr>
<tr>
<td>c. dʒəʃkər.d-utjún</td>
<td>()</td>
<td>()</td>
<td>(*)</td>
<td>(*)</td>
</tr>
</tbody>
</table>
### Formalizing reduction – Diphthong

- \( N^*V\)-diph-[stress]: no (non-schwa) diphthong vowels that were stressed but not anymore (destressed)
- \( \text{DIST} \leq 1\): do not let diphthongs lose more than 1 mora

<table>
<thead>
<tr>
<th></th>
<th>[kújn] + /avor/</th>
<th>DIST \leq 1</th>
<th>( N^*V)-diph-[stress]</th>
<th>MAX-( \mu)[+HIGH]</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>kujn-avór</td>
<td></td>
<td>*!</td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td>kun-avór</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>c.</td>
<td>kën-avór</td>
<td>*!</td>
<td></td>
<td>**</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>[tsájn] + /avor/</th>
<th>DIST \leq 1</th>
<th>MAX-( \mu)[-HIGH]</th>
<th>( N^*V)-diph-[stress]</th>
<th>MAX-( \mu)[+HIGH]</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>tsajn-avór</td>
<td></td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>b.</td>
<td>tsan-avór</td>
<td></td>
<td>*!</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>c.</td>
<td>tsën-avór</td>
<td>*!</td>
<td>**</td>
<td></td>
<td>**</td>
</tr>
</tbody>
</table>
**Stratal Re-ranking**

- **Stem:** $N V[-\text{stress}] \rightarrow \text{MAX}-\mu-[-\text{HIGH}] \rightarrow \text{MAX}[-\text{HIGH}]$

<table>
<thead>
<tr>
<th>[amusín] + /anal/</th>
<th>*$N V[-\text{stress}]$</th>
<th>MAX-\mu-[-HIGH]</th>
<th>MAX-[-HIGH]</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. amusin-anal</td>
<td>*!</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. amusn-anal</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>c. amusən-anal</td>
<td></td>
<td>*!</td>
<td></td>
</tr>
</tbody>
</table>

- **Word:** MAX-\mu-[-HIGH] $\rightarrow$ MAX[-HIGH] $\rightarrow$ *$N V[-\text{stress}]$

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a. amusin-ner</td>
<td></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>b. amusn-ner</td>
<td></td>
<td>*!</td>
<td></td>
</tr>
<tr>
<td>c. amusən-ner</td>
<td>*!</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Destressing?

- Unstressed reduction is common, destressing is not
Unstressed reduction is common, destressing is not

- Armenian (Khanjian, 2009)
- Palauan (Zuraw, 2003)
- Romanian (Steriade, 2008)
Destressing?

- Unstressed reduction is common, destressing is not
  - Armenian (Khanjian, 2009)
  - Palauan (Zuraw, 2003)
  - Romanian (Steriade, 2008)
- Stress not contrastive so odd lexical rule
- However...
Destressing?

- Unstressed reduction is common, destressing is not
  - Armenian (Khanjian, 2009)
  - Palauan (Zuraw, 2003)
  - Romanian (Steriade, 2008)
- Stress not contrastive so odd lexical rule
- However... stress is H tone (Athanasopoulou u. a., 2017)
- Could treat destressing as losing H tone association
Alternative to Destressing

- Me: high vowel reduce if destressed in Stem-Level (WA)

(118)  

a. \((\text{amusín})_p\) \quad ‘husband’

b. \((\text{amusín})_p\text{-nér}\) \quad ‘husband-PL’

c. \((\text{amusín})_p\text{-óv}\) \quad ‘husband-INST’

d. \((\text{amusn-agán})_p\) \quad ‘marital’
Alternative to Destressing

- Me: high vowel reduce if destressed in Stem-Level (WA)

(119)  
  a. \((\text{amus}\text{í}n)_{p}\) ‘husband’
  b. \((\text{amus}\text{in})_{p-\text{né}r}\) ‘husband-PL’
  c. \((\text{amus}\text{in})_{p-\text{ób}}\) ‘husband-INST’
  d. \((\text{amus}\text{n}-\text{agán})_{p}\) ‘marital’

- Alternative: high vowel reduce if:
  1. final syllable in a morpheme
  2. inside MStem (=root or Der morpheme)
  3. but not final morpheme in MStem (Der after it)
  4. ignoring any inflection
Alternative to Destressing

● Me: high vowel reduce if destressed in Stem-Level (WA)

(120)  a. \((\text{amus} \text{ín})_p\) ‘husband’

b. \((\text{amus} \text{in})_p-\text{nér}\) ‘husband-PL’

c. \((\text{amus} \text{in})_p-\text{óv}\) ‘husband-INST’

d. \((\text{amus} \text{sn-ag} \text{án})_p\) ‘marital’

● Alternative: high vowel reduce if:

1. final syllable in a morpheme
2. inside MStem (=root or Der morpheme)
3. but not final morpheme in MStem (Der after it)
4. ignoring any inflection

● Alternative lists the contexts, while destressing unifies them
Alternative to Destressing

- Me: high vowel reduce if destressed in Stem-Level (WA)

(121)  a. (lúj)\textsubscript{p} ‘light’
Alternative to Destressing

- Me: high vowel reduce if destressed in Stem-Level (WA)

  \[
  (122) \quad \begin{align*}
  a. & \quad (lújs)_p & \text{‘light’} \\
  b. & \quad (lus-avór)_p & \text{‘illuminous’}
  \end{align*}
  \]
Alternative to Destressing

- Me: high vowel reduce if destressed in Stem-Level (WA)

(123)  a. (lújs)ₚ  ‘light’
       b. (lus-avóř)ₚ  ‘illuminous’
       c. (lus-avor-íťf)ₚ  ‘illuminator’
Alternative to Destressing

- Me: high vowel reduce if destressed in Stem-Level (WA)

(124)  
  a. \((lúj)s_p\)  
  ‘light’
  
  b. \((lus-avór)_p\)  
  ‘illuminous’
  
  c. \((lus-avor-íťf)_p\)  
  ‘illuminator’
  
  d. \((lus-avor-itf)_p-óv\)  
  ‘illuminator-INSTR’
Alternative to Destressing

- Me: high vowel reduce if destressed in Stem-Level (WA)

(125)

a. \((\text{łújs})_p\) ‘light’
b. \((\text{łus-avór})_p\) ‘illuminous’
c. \((\text{łus-avor-ítf})_p\) ‘illuminator’
d. \((\text{łus-avor-ítf})_p-óv\) ‘illuminator-INSTR’
e. \((\text{łus-avor-tj-agán})_p\) ‘Apostolic’
Alternative to Destressing

- Me: high vowel reduce if distressed in Stem-Level (WA)

\[(126) \quad \begin{align*}
    a. & \quad (lújs)_{p} & \text{‘light’} \\
    b. & \quad (lus-avór)_{p} & \text{‘illuminous’} \\
    c. & \quad (lus-avor-ítʃ)_{p} & \text{‘illuminator’} \\
    d. & \quad (lus-avor-ítʃ)_{p}-óv & \text{‘illuminator-INSTR’} \\
    e. & \quad (lus-avor-tʃ-agán)_{p} & \text{‘Apostolic’}
\end{align*}\]

- Alternative: high vowel reduce if:
  1. final syllable in a morpheme
  2. inside MStem (=root or Der morpheme)
  3. but not final morpheme in MStem (Der after it)
  4. ignoring any inflection
Alternative to Destressing

- Me: high vowel reduce if destressed in Stem-Level (WA)

(127) a. \((lújs)_p\) ‘light’
b. \((lus-avór)_p\) ‘illuminous’
c. \((lus-avor-íťʃ)_p\) ‘illuminator’
d. \((lus-avor-íťʃ)_p-óv\) ‘illuminator-INSTR’
e. \((lus-avor-ťʃ-agán)_p\) ‘Apostolic’

- Alternative: high vowel reduce if:
  1. final syllable in a morpheme
  2. inside MStem (=root or Der morpheme)
  3. but not final morpheme in MStem (Der after it)
  4. ignoring any inflection

- Alternative lists the contexts, while destressing unifies them
Alternative to Destressing

- Me: high vowel reduce if distressed in (misaligned) Stem-Level (EA)

\[(128) \quad \begin{align*}
\text{a. } (\text{amusín})_p & \quad \text{‘husband’} \\
\text{b. } (\text{amusín})_p-né̞r & \quad \text{‘husband-PL’} \\
\text{c. } (\text{amusn-óv})_p & \quad \text{‘husband-INST’} \\
\text{d. } (\text{amusn-agán})_p & \quad \text{‘marital’}
\end{align*}\]
Alternative to Destressing

- Me: high vowel reduce if destressed in (misaligned) Stem-Level (EA)

(129)  
  a. (amusín)$_p$  
  b. (amusín)$_p$-néř  
  c. (amusn-óv)$_p$  
  d. (amusn-agán)$_p$

- Alternative: high vowel reduce if:
  1. final syllable in a morpheme
  2. inside MStem (=root or Der morpheme)
  3. but not final morpheme in MStem (Der after it, or V-Inf)
  4. ignoring any inflection (except V-Inf)
**Alternative to Destressing**

- Me: high vowel reduce if destressed in (misaligned) Stem-Level (EA)

  (130)  
  a. (amusín)_p  ‘husband’
  b. (amusín)_p-néř  ‘husband-PL’
  c. (amunsn-óv)_p  ‘husband-INST’
  d. (amunsn-agán)_p  ‘marital’

- Alternative: high vowel reduce if:
  1. final syllable in a morpheme
  2. **inside** MStem (=root or Der morpheme)
  3. but **not** final morpheme in MStem (Der after it, or V-Inf)
  4. ignoring any inflection (except V-Inf)

- Alternative lists the contexts, while destressing unifies them
**Alternative to Destressing**

- Me: high vowel reduce if destressed in (misaligned) Stem-Level (EA)

\[(131) \quad a. \quad (amus\text{ín})_p \quad \text{‘husband’} \\
 b. \quad (amus\text{ín})_p\text{-nér} \quad \text{‘husband-PL’} \\
 c. \quad (amus\text{n-óv})_p \quad \text{‘husband-INST’} \\
 d. \quad (amus\text{n-agán})_p \quad \text{‘marital’} \]

- Alternative: high vowel reduce if:
  1. final syllable in a morpheme
  2. inside MStem (=root or Der morpheme)
  3. but not final morpheme in MStem (Der after it, or V-Inf)
  4. ignoring any inflection (except V-Inf)

- Alternative lists the contexts, while destressing unifies them
- Also... how would you even formalize that and ensure locality? Anti-faithfulness? Anti-matter?
Alternative to Cycles

- Me: lexical phonology (Stratal OT) and I-O
- Alternative: Output-Output correspondence
Alternative to Cycles

- Me: lexical phonology (Stratal OT) and I-O
- Alternative: Output-Output correspondence
- But: equivalent when the bases exist Bermúdez-Otero (2011)
## Alternative to Cycles

- Me: high vowel reduce if distressed in Stem-Level using I-O

<table>
<thead>
<tr>
<th>amusín+/agan/</th>
<th>Markedness</th>
<th>IO-Faith</th>
</tr>
</thead>
</table>
a. amusín-agán | !          |          |
b. amusn-agán  | !          | !        |
Alternative to Cycles

- Me: high vowel reduce if destressed in Stem-Level using I-O

<table>
<thead>
<tr>
<th></th>
<th>Markedness</th>
<th>IO-Faith</th>
</tr>
</thead>
<tbody>
<tr>
<td>amusín+/agan/</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. amusín-agán</td>
<td>*!</td>
<td></td>
</tr>
<tr>
<td>b. amusín-agán</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Alternative: high vowel reduce if destressed by adding Der. using OO-Base-Der

<table>
<thead>
<tr>
<th></th>
<th>Markedness</th>
<th>OO-Base-Der</th>
</tr>
</thead>
<tbody>
<tr>
<td>/amusín-agán/</td>
<td></td>
<td></td>
</tr>
<tr>
<td>base=amusín</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. amusín-agán</td>
<td>*!</td>
<td></td>
</tr>
<tr>
<td>b. amusín-agán</td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>
Alternative to Cycles

- Me: high vowel reduce if distressed in Stem-Level using I-O...
Alternative to Cycles

- Me: high vowel reduce if destressed in Stem-Level using I-O...but not in Word-Level

<table>
<thead>
<tr>
<th></th>
<th>IO-Faith</th>
<th>Markedness</th>
</tr>
</thead>
<tbody>
<tr>
<td>amusɨn+/ ner/</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. amusɨn-nér</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>b. amusɛn-nér</td>
<td>*!</td>
<td></td>
</tr>
</tbody>
</table>
Alternative to Cycles

- Me: high vowel reduce if distressed in Stem-Level using I-O...but not in Word-Level

<table>
<thead>
<tr>
<th></th>
<th>IO-Faith</th>
<th>Markedness</th>
</tr>
</thead>
<tbody>
<tr>
<td>amusīn+/ner/</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. amusin-nér</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>b. amusën-nér</td>
<td>*!</td>
<td></td>
</tr>
</tbody>
</table>

- Alternative: high vowel reduce if distressed by adding Der. using OO-Base-...
Alternative to Cycles

- Me: high vowel reduce if stressed in Stem-Level using I-O...but not in Word-Level

<table>
<thead>
<tr>
<th>amusín+/ner/</th>
<th>IO-Faith</th>
<th>Markedness</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. amusin-nér</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>b. amusén-nér</td>
<td></td>
<td>*!</td>
</tr>
</tbody>
</table>

- Alternative: high vowel reduce if stressed by adding Der. using OO-Base-... but not by Inf using OO-Base-Inf

<table>
<thead>
<tr>
<th>/amusin-ner/</th>
<th>OO-Base-Inf</th>
<th>Markedness</th>
<th>OO-Base-Der</th>
</tr>
</thead>
<tbody>
<tr>
<td>base=amusín</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. amusín-nér</td>
<td></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>b. amusén-nér</td>
<td></td>
<td>*!</td>
<td></td>
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</tbody>
</table>
Alternative to Cycles

- Me: EA has high vowel reduce before V-initial because syllabification
**Alternative to Cycles**

- **Me:** EA has high vowel reduce before V-initial because syllabification
- **Alternative:** EA has separate OO-BI constraints for V- vs C-initial inflection

<table>
<thead>
<tr>
<th></th>
<th>/amusin-ov/</th>
<th>OO-B-CI</th>
<th>Markedness</th>
<th>OO-BD</th>
<th>OO-B-VI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>base=amusin</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a.</td>
<td>amusin-óv</td>
<td></td>
<td>*!</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td>musn-óv</td>
<td></td>
<td></td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>
**Alternative to Cycles**

- **Me:** EA has high vowel reduce before V-initial because syllabification
- **Alternative:** EA has separate OO-BI constraints for V- vs C-initial inflection

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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. amusin-óv</td>
<td></td>
<td>*!</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. amusin-óv</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>a. amusin-nér</td>
<td></td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. amusin-nér</td>
<td></td>
<td>*!</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Vowel reduction – root edges

- Destressed high vowel must be root-medial...

(132)  
  a. kír  
  b. kəɾ-utjún  

   ‘letter’  
   ‘literature’
Vowel reduction – root edges

- Destressed high vowel must be root-medial...

  (135)  
  a.  kir  
  b.  ḵṟ-utjún  

- Can’t reduce if root-initial or root-final...

  (136)  
  a.  úz  
  b.  u̱ẕ-éɣ  *ẕ-éɣ  

  (137)  
  a.  ṯsi̱  
  b.  ṯsi̱-[j]-avóř  *ṯs̱-avóř  

Vowel reduction – root edges

- Applies to V-final suffixes to, not V-initial

(138)  a.  nəgář  ‘painting’
    b.  nəgar-íťř  ‘painter’
    c.  nəgar-ťř-agán  ‘picturesque’

Derivational suffixes behave like roots (Creemers u. a., 2018)

Constraint: MAX-(Root,L/R,V)
Vowel reduction – root edges

• Applies to V-final suffixes to, not V-initial

(140) a. nəgár ‘painting’
    b. nəgar-ítʃ ‘painter’
    c. nəgar-ʃ-ågån ‘picturesque’

(141) a. kaβáb ‘city’
    b. kaγak-atsí ‘citizen’
    c. kaγak-atsí-[j]-utjúŋ ‘citizenship’

• Derivational suffixes behave like roots (Creemers u. a., 2018)
• Constraint: MAX-(Root,L/R,V)?
What about phases?

- Phonological derivation by phase (PDbP) and prosodic lexical phonology (PLP) are cousins
What about phases?

- Phonological derivation by phase (PDbP) and prosodic lexical phonology (PLP) are cousins
- **Morphology**: PDbP posits empty der. suffixes for free-standing stems + relabeling
What about phases?

- **What’s a cycle:** PDbP argues that phonological cycles are triggered by phases (=derivational suffixes)
- **What’s phonology:** PDbP doesn’t have cophonologies
What about phases?

- **What’s a cycle:** PDbP argues that phonological cycles are triggered by phases (=derivational suffixes)
- **What’s phonology:** PDbP doesn’t have cophonologies
- Ignoring inflection, both PDbP and PLP have Der. trigger stress+reduction

```
PLP                                      PDbP
MS                                       a
  MS                                    /agan/
    Der
  /amusin/   /-agan/
```

```
/amusin/ -o -/agan/
```
What about phases?

- **What’s a cycle**: PDbP argues that phonological cycles are triggered by phases (=derivational suffixes)
- **What’s phonology**: PDbP doesn’t have cophonologies
- Ignoring inflection, both PDbP and PLP have Der. trigger stress+reduction

```
PLP
  MS
    MS
      Der
        [amusín] /-agan/

PDbP
  a
    n
      root
        n
          a
            [amusín -Ø] /-agan/
```
What about phases?

- **What’s a cycle**: PDbP argues that phonological cycles are triggered by phases (=derivational suffixes)
- **What’s phonology**: PDbP doesn’t have cophonologies
- Ignoring inflection, both PDbP and PLP have Der. trigger stress+reduction... as long as allow stress+reduction to violate PIC

```
PLP                  PDbP

MS

MS

Der

[amusn -agán]       [amusn -ø -agán]
```
What about phases?

- **Inflection**: Inf doesn’t trigger cycles in PDbP (=not a phase) but they do in PLP
- **WA**: PLP explains why reduction doesn’t happen via strata (2 cycles)
- **WA**: PDbP does it via spelling out Inf with roots
  → roots never get stressed! (1 cycle)
What about phases?

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  →roots never get stressed! (1 cycle)

PLP

- MW
  - MS
    - Inf
      - [amusín] /-ov/

PDbP

- Case
  - n
    - root
      - /amusin/ -Ø /-ov/
What about phases?

- **Inflection**: Inf doesn’t trigger cycles in PDbP (=not a phase) but they do in PLP
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  →roots never get stressed! (1 cycle)

\[
\begin{array}{c}
\text{PLP} \\
\text{MW} \\
\text{MS} \\
\text{Inf} \\
[\text{amusin} \ -\acute{o}] \\
\hline \\
\text{PDbP} \\
\text{Case} \\
\text{n} \\
\text{root} \\
[\text{amusin} \ -\emptyset \ -\acute{o}] \\
\end{array}
\]
What about phases?

- **EA...**: But for EA V-initial to trigger reduction, the V-initial suffixes would get \([+\text{phase?}]\) diacritic
- **WA**: n’t need diacritics because it used an active P-constituent+resyllabification

```
      PLP
      MW
        MS
        Inf
        /amusin/ /-ov/
      PDbP
      Case
        n
        root
        /amusin/ -\(\emptyset\) /-ov[+\text{phase}]/
```
What about phases?

- **EA...**: But for EA V-initial to trigger reduction, the V-initial suffixes would get [+phase?] diacritic
- **WA**: PLP didn’t need diacritics because it used an active P-constituent + resyllabification

\[
\begin{align*}
\text{PLP} & \quad \text{PDbP} \\
\text{MW} & \quad \text{Case} \\
\text{MS} & \quad \text{Inf} \\
(\text{amus} \hat{\text{i}} \text{nin})_{ps} & \quad /-ov/ \\
\text{root} & \quad n \\
/\text{amusin}/ & \quad -\emptyset \quad /-ov[+]\text{phase}]/
\end{align*}
\]
What about phases?

- **EA...**: But for EA V-initial to trigger reduction, the V-initial suffixes would get [+phase?] diacritic
- **WA**: PLP didn’t need diacritics because it used an active P-constituent + resyllabification

```
\begin{center}
\begin{tikzpicture}[level distance=1.5cm, sibling distance=2.5cm, level 1/.style={sibling distance=3cm}]
  \node {PLP}
  \node[below] {MW}
  \node[below] {MS}
  \node[below] {Inf}
  \node[below] {(amusín)$_{ps}$ -ov}
  \node[below] {/amusín/ -∅ -ov[+phase]/}

  \node {PDbP}
  \node[below] {Case}
  \node[below] {n}
  \node[below] {root n Case}
\end{tikzpicture}
\end{center}
```
What about phases?

- **EA...**: But for EA V-initial to trigger reduction, the V-initial suffixes would get [+phase?] diacritic
- **WA**: PLP didn’t need diacritics because it used an active P-constituent + resyllabification

**Diagram**

```
PLP
  MW
    MS
      Inf
        (amusí.n)_{ps} -ov

PDbP
  Case
    n
      root
        /amusin/ -∅ /-ov[+phase]/
```

Hossep Dolatian (SBU)
March 24, 2018 103 / 111
What about phases?

- **EA...**: But for EA V-initial to trigger reduction, the V-initial suffixes would get [+phase?] diacritic
- **WA**: PLP didn’t need diacritics because it used an active P-constituent + resyllabification

```
PLP           PDbP
  MW
    MS
      Inf
        (amusí.n -ov)_{ps}
    /amusin/ -∅ /-ov[+phase]/
```

Case
What about phases?

- **EA...**: But for EA V-initial to trigger reduction, the V-initial suffixes would get [+phase?] diacritic
- **WA**: PLP didn’t need diacritics because it used an active P-constituent + resyllabification

---

**PLP**

```
+----------------+----------------+
| MS             | Case           |
|                |                |
| (amus .n -óv)_p | /amusin/ -∅ /-ov[+phase]/ |
```

**PDbP**

```
+----------------+----------------+
| MS             | Case           |
|                |                |
| (amus .n -óv)_p | /amusin/ -∅ /-ov[+phase]/ |
```

---

Hossef Dolațian (SBU)  
March 24, 2018 105 / 111
What about phases?

- **EA...:** But for EA V-initial to trigger reduction, the V-initial suffixes would get [+phase?] diacritic
- **WA:** PLP didn’t need diacritics because it used an active P-constituent+resyllabification

```
PLP
  MW
    MS
      Inf
        (amus.n -óv)ps

PDbP
  Case
    n
      root
        n
          /-ov[+phase]/
```

Hossep Dolațián (SBU)
March 24, 2018
What about phases?

- **EA...**: But for EA V-initial to trigger reduction, the V-initial suffixes would get [+phase?] diacritic
- **WA**: PLP didn’t need diacritics because it used an active P-constituent+resyllabication

```
PLP
  MW
  MS
    Inf
      (amus.n  -óv)ps

PDbP
  Case
    n
      root
        n
          Case
            [amusn  -Ø  -óv [+phase]]
```
What about phases? – tangent

- **PCSA:** But the PL suffix is -er after monosyllabic bases, -ner elsewhere

  (142)  
  a. ház → haz-ér  ‘sneeze’→‘sneezes’
  b. daráz → daraz-nér  ‘costume’→‘costumes’
What about phases? – tangent

- **PCSA:** But the PL suffix is -er after monosyllabic bases, -ner elsewhere

  (144) a. ház  → haz-ér  ‘sneeze’→‘sneezes’
b. daráž  → daráz-nér  ‘costume’→‘costumes’

- -er triggers reduction in EA, -ner doesn’t
What about phases? — tangent

- **PCSA:** But the PL suffix is -er after monosyllabic bases, -ner elsewhere

  (146)  
  a. ház → haz-ér  ‘sneeze’→‘sneezes’
  b. daráz → daraz-nér  ‘costume’→‘costumes’

- er triggers reduction in EA, -ner doesn’t

  (147)  
  a. míis → mës-ér  ‘meat’→‘meats’
  b. amíis → amis-nér  ‘month’→‘months’
So what?

- The base needs to syllabify to pick the right suffix
- But for the C-initial -ner to not trigger reduction, PDbP needs the root to be spelled out with the suffix
- Can’t syllabify without triggering reduction

```
Numb
  \n  n
  root n PL
  /amusin/ -Ø ???
```
So what?

- The base needs to syllabify to pick the right suffix
- But for the C-initial -ner to not trigger reduction, PDbP needs the root to be spelled out with the suffix
- Can’t syllabify without triggering reduction
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- The base needs to syllabify to pick the right suffix
- But for the C-initial -ner to not trigger reduction, PDbP needs the root to be spelled out with the suffix
- Can’t syllabify without triggering reduction

```
Numb
  /\     /
 / n   / PL
/     /     /
/  root /n
/  *[a.musn -Ø -néř]
```