PROSODICALLY-CONDITIONED RELATIVE CLAUSE EXTRAPOSITION IN WESTERN ARMENIAN

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  - Ditransitive verbs
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Title: *Prosodically-conditioned relative clause extraposition in Western Armenian*

Look at relative clauses in Western Armenian

Find that relative clauses can extrapose

Extraposition is conditioned mainly by prosodic phrasing $\phi$

Base sentence: $(N \ V)_\phi$ $|$ $(N) \ (V)_\phi$

Plus relative clause: $(N \ V)_\phi (RC)_\phi$ $|$ $(N)_\phi (RC)_\phi \ (V)_\phi$
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BACKGROUND

- Armenian is an Indo-European language with two standard dialects: Western and Eastern
- Focus mainly on Western, but generalizations extend to Eastern
NOUN PHRASE

- Words have final stress + penult if final vowel is schwa
- Noun phrases are head-final: X N
- Noun phrases form a right-headed prosodic phrase $\phi$

1. (Adj N)$\phi$
   - gabujd ag'ra-n blue tooth-DEF
   - ‘the blue tooth’
2. (N N)$\phi$
   - maroj-i-n də'ka-n Mary-GEN-DEF son-DEF
   - ‘Mary’s son’
Verb phrases are head-final: X V

For Western Armenian, OV orders are more typical than VO orders

Prosodically, the final verb is deaccented + the preverbal item carries phrasal stress

Nuclear stress is on the last phrasal stress (= usually whatever precedes the verb)

(3) \((N \quad V)_\phi\)

na’mag uni

letter has

‘He has a letter.’

(4) \((Adj \quad V)_\phi\)

u’raχ jeba

happy became

‘I became happy.’

Relative Clauses

- Armenian has different types of relative clauses (RC)
- Focus on simple finite clauses
- Has overt complementizer [voɾ] որ ‘that’
- The RC is post-nominal
- RC is parsed as separate prosodic phrase

(5) a. (N)φ (that RC )φ
   na'mag-ə [voɾ gar'mir e]
   letter-DEF that red is
   ‘the letter that is red’
   նամակը որ կարմիր է

b. (Adj N)φ (that RC)φ
   garmir na'mag-ə [voɾ gartatsɨ]
   red letter-DEF that read
   ‘the red letter that I read’
   կարմիր նամակը որ կարդացի
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A typical RC is placed directly after the noun

(6) \((S)_\phi \quad (\text{that } RC \quad )_\phi \quad (O \quad V)_\phi \)

\('\text{man-DEF that sick is letter-INDF has}'

‘The man who is sick has a letter.’

Մարդը որ հիւանդ է նամակ ունի
Relative Clauses and Extraposition

- A typical RC is placed directly after the noun

\[(S_\phi (\text{that } RC_\phi O_\phi \text{ V}_\phi \text{'mar}-e \ [\text{vo} \text{r } \text{hi}'v\text{an}t \ e] \ na'mag-m\text{a } \text{uni} \text{ man-DEF that } \text{sick } \text{is letter-INDF has})' \text{The man who is sick has a letter.'} \]

- But if the noun is the verb’s object, then we see extraposition

\[(S_\phi (O \phi \text{ V}_\phi (\text{that } RC_\phi )_\phi \text{'mar}-e \ na'mag-m\text{a } \text{uni} [\text{vo} \text{r } \text{gar}'m\text{ir } e] \text{man-DEF letter-INDF has that } \text{red } \text{is})' \text{The man has a letter that is red.'} \]
Extraposition of an object’s RC is the default

(10) \[(S)_{\phi} (O V)_{\phi} (that \text{ RC} )_{\phi} \]

‘The man has a letter that is red.’

Մարդը նամակ մը ունի որ կարմիր է

Lack of extraposition is possible, but it implies that the object is given information or topicalized. Focus is then on the verb

(11) \[(S)_{\phi} (O V)_{\phi} (that \text{ RC} )_{\phi} \]

‘The man has a letter that is red.’

OR ‘The man, a letter that is red, he has.’

Մարդը, նամակ մը որ կարմիր է, ունի
Pragmatics of not extraposing

• Extraposition of an object’s RC is the default

(12) \((S)_\phi (O \text{ V})_\phi (\text{that RC})_\phi\)

\[\text{man-def letter-INDF has that red is}\]

‘The man has a letter that is red.’

• Lack of extraposition is possible, but it implies that the object is given information or topicalized. Focus is then on the verb

(13) \((S)_\phi (O)_\phi (\text{that RC})_\phi (V)_\phi\)

\[\text{man-def letter-INDF has that red is}\]

‘The man HAS a letter that is red.’

OR ‘The man, a letter that is red, he HAS.’
Other objects

- Previous example had an indefinite object. Same patterns apply for a definite object
- Default: N V RC

\[(14) \quad (O \quad V)_{\phi} (that \quad RC)_{\phi} \quad \\
na'mag-ə \quad uni \quad [vor \quad gar'mir \ e] \quad \\
letter-DEF \quad has \quad that \quad red \quad is \quad \\
'He has the letter that is red.' \]

 bernamkina ha jena jibamnana
Other objects

- Previous example had an indefinite object. Same patterns apply for a definite object
- Default: N V RC

\[
(16) \quad (O \quad V)_{φ} \quad (that \quad RC \quad )_{φ} \\
\text{na}^{m} \text{ag-ə uni [vor gar}^{m} \text{ir e]} \\
\text{letter-DEF has that red is} \\
‘He has the letter that is red.’
\]

- Not-default: N RC V

\[
(17) \quad (O)_{φ} \quad (that \quad RC \quad )_{φ} \quad (V)_{φ} \\
\text{na}^{m} \text{ag-ə [vor gar}^{m} \text{ir e]} \quad \text{u}^{n} \text{i} \\
\text{letter-DEF has that red is} \\
‘He HAS the letter that is red.’ \\
\text{OR ‘The letter that is red, he HAS.’}
\]
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Interim summary

- See a syntax-prosody correlation between,
  - a noun’s RC will extrapose
  - if the noun is prosodically phrased with the verb
- Before we formalize this correlation, let’s verify it more
Ditransitivies

- Prosody is more superficial than syntax, so we expect to see effects of linearity
- In ditransitivies, the pre-verbal object is phrased with the verb

\[(18) \quad (\text{DO})_\phi (\text{IO} \quad \text{V})_\phi\]

\[
\text{namag-ə varbe'd-i-n \ dəvi letter-DEF boss-DAT-DEF gave}
\]

‘I gave the letter to the boss.’
• Prosody is more superficial than syntax, so we expect to see effects of linearity
• In ditransitives, the pre-verbal object is phrased with the verb

\[(21) \quad (DO)_{\phi} \quad (IO \quad V)_{\phi}\]
\[\text{na}'\text{mag-ә varbe}'\text{d-i-n} \quad \text{dəvi}\]
\[\text{letter-DEF boss-DAT-DEF gave}\]
\[\text{‘I gave the letter to the boss.’}\]

(22) Can use either DO + IO or IO + DO order

\[(23) \quad (IO)_{\phi} \quad (DO \quad V)_{\phi}\]
\[\text{varbe}'\text{d-i-n} \quad \text{na}'\text{mag-ә dəvi}\]
\[\text{boss-DAT-DEF letter-DEF gave}\]
\[\text{‘I gave the letter to the boss.’}\]
• If the first argument (not pre-verbal) gets an RC, there is no extraposition

\[(DO)_{\phi} \text{ (that RC )}_{\phi} \text{ (IO V) }_{\phi}\]

\[na'mag-\varepsilon \text{ [vör garmir er] varbe'd-i-n } d\epsilonvi\]

\[\text{letter-DEF that red was boss-DAT-DEF gave}\]

‘I gave the letter that was red to the boss.’
• If the first argument (not pre-verbal) gets an RC, there is no extraposition

\begin{align*}
\text{(26) } & \left(\text{DO}\right)_\phi (\text{that RC })_\phi (\text{IO } \text{V})_\phi \\
& \text{na'\text{mag-ə } [v\text{or g\text{armi\text{r er}}] varbe'd-i-n dəvi letter-DEF that red was boss-DAT-DEF gave} \\
& \text{‘I gave the letter that was red to the boss.’}
\end{align*}

\begin{align*}
\text{(27) } & \left(\text{IO}\right)_\phi (\text{that RC })_\phi (\text{DO } \text{V})_\phi \\
& \text{varbe'd-i-n [v\text{or g\text{armi\text{r er}}] na'\text{mag-ə dəvi boss-DAT-DEF that red was letter-DEF gave} \\
& \text{‘I gave the letter to the boss who was red.’}
\end{align*}
• If the second argument (pre-verbal) gets an RC, that RC is extraposed

(28)  \((DO)_\phi (IO \quad V)_\phi (\text{that RC } )_\phi\)

\[\text{na’mag-ә varbe’d-i-n dəvi [vor garmir er] letter-DEF boss-DAT-DEF gave that red was}\]

‘I gave the letter to the boss who was red.’
Ditransitives

• If the second argument (pre-verbal) gets an RC, that RC is extraposed

\[
(30) \quad (\text{DO})_\phi \quad (\text{IO} \quad \text{V})_\phi \quad (\text{that RC})_\phi \\
\text{na}'\text{mag-ə varbe}'\text{d-i-n dəvi [vor garmir er] letter-DEF boss-DAT-DEF gave that red was} \\
\text{‘I gave the letter to the boss who was red.’}
\]

\[
(31) \quad (\text{IO})_\phi \quad (\text{DO} \quad \text{V})_\phi \quad (\text{that RC})_\phi \\
\text{varbe}'\text{d-i-n na}'\text{mag-ə dəvi [vor garmir er] boss-DAT-DEF letter-DEF gave that red was} \\
\text{‘I gave the letter that was red to the boss.’}
\]
TRANSITIVE SUBJECTS

- Previous sentences were transitive (S)OV sentence. The object’s RC would extrapose
- In SOV, the transitive subject’s RC does not extrapose

\[(32) \quad (S)_\phi (\text{that RC } )_\phi (O \quad \text{V})_\phi\]

\[\text{ˈmɑɾt-ə \ [vɔɾ \ gɑɾˈmiɾ \ e] \ naˈmag-ə \ uni\]}

\[\text{man-DEF that red is letter-DEF has}\]

‘The man who is red, has the letter

հայտնի այնքան է նամակի
Transitive subjects

- Previous sentences were transitive (S)OV sentence. The object’s RC would extrapose

- In SOV, the transitive subject’s RC does not extrapose

  \[(34) \quad (S)_{\phi} (\text{that RC})_{\phi} (O \quad V)_{\phi} \]

  \[\text{'man-DEF that red is letter-DEF has}\]

  ‘The man who is red, has the letter"

- If object is overt, then the extraposed RC is interpreted as the object’s, not the subject’s

  \[(35) \quad (S)_{\phi} (O \quad V)_{\phi} (\text{that RC})_{\phi} \]

  \[\text{'man-DEF letter-DEF has that red is}\]

  ‘The man has the letter that is red.’

  ‘The man who is red, has the letter'
• If the object is covert in SV, then an extraposed RC is uninterpretable

\[(36) \quad (S)_\phi \quad (V)_\phi \quad \#(\text{that RC})_\phi
\]

\['\text{man-DEF has that red is}\n\]

‘The man (#that is red) has a thing (#that is red).’

--

\(\text{man-DEF has that red is}\)

\['\text{man-DEF has that red is}\n\]

‘The man (#that is red) has a thing (#that is red).’
Transitive subjects

- If the object is covert in SV, then an extraposed RC is uninterpretable

\[(S)_\phi (V)_\phi \#(\text{that } \text{RC } )_\phi\]

\[\text{man-DEF has that red is}\]

‘The man (#that is red) has a thing (#that is red).’

- BUT, if have OSV sentence where the SV is a single prosodic phrase, then we can get extraposition

\[(O)_\phi (S \text{ } V)_\phi \#(\text{that } \text{RC } )_\phi\]

\[\text{Mariam-DAT-DEF bee-INDF bit that red was}\]

‘A bee that was red stung Mariam.’

- The above ‘bee’ sentence is a case of agent pseudo-incorporation (Kalomoiros, 2022)
**Intransitive subjects**

- For intransitive verbs, see split-behavior based on unaccusatives vs. unergatives and definite vs. indefinite

- Indefinite S + unaccusative V: single prosodic phrase + extraposition

  \[(40) \ (S \quad V) (\text{that RC} \quad φ)\]

  *man-*mə jegav [vor hivant er]

  man-INDF came who sick is

  ‘A man came who was sick.’

- Definite S + unaccusative V: same

  \[(41) \ (S \quad V) (\text{that RC} \quad φ)\]

  *man-*ə jegav [vor hivant er]

  man-DEF came who sick is

  ‘The man came who was sick.’
Intransitive subjects

- Unergatives are more complicated
- Indefinite S + unergative V: single prosodic phrase

\[(42) \quad (S \quad V)_\phi \]
'\text{man-INDF yelled}

\text{‘A man yelled.’}

- + extraposition

\[(43) \quad (S \quad V)_\phi \quad (\text{that RC } \phi)
\]

\text{‘A man yelled who was sick.’}

**Intransitive Subjects**

- Definite S + unergative V: separate prosodic phrases

\[(44) \ (S)_φ \quad (V)_φ \]

\[\text{\'mart-ə \ borats} \]

\[\text{man-DEF yelled} \]

\[\text{‘The man yelled.’} \]

**Markdown Format**

```markdown
- Definite S + unergative V: separate prosodic phrases

\[(44) \ (S)_φ \quad (V)_φ \]

\[\text{\'mart-ə \ borats} \]

\[\text{man-DEF yelled} \]

\[\text{‘The man yelled.’} \]
```
**Intransitive Subjects**

- Definite S + unergative V: separate prosodic phrases

\[(47) \ (S)_{\phi} \ (V)_{\phi} \]

ˈmart-ə boɾats

man-DEF yelled

‘The man yelled.’ Մարդը պոռաց

- + no extrapolation

\[(48) \ (S)_{\phi} \ (that \ RC)_{\phi} \ (V)_{\phi} \]

ˈmart-ə [vor hivant er] boɾats

man-DEF who sick is yelled

‘The man yelled who was sick.’ Մարդը որ հիւանդ էր պոռաց
Intransitive subjects

• Definite S + unergative V: separate prosodic phrases

\[(50) \quad (S)_\phi \quad (V)_\phi \]
\[\text{'mart-ə} \quad \text{borats} \quad \text{man-DEF yielded} \]
\[\text{‘The man yelled.’ Մարդը պոռաց} \]

• + no extraposition

\[(51) \quad (S)_\phi \quad (\text{that RC})_\phi \quad (V)_\phi \]
\[\text{'mart-ə} \quad [\text{vor hivant er}] \quad \text{borats} \quad \text{man-DEF who sick is yielded} \]
\[\text{‘The man yelled who was sick.’ Մարդը որ հիւանդ էր պոռաց} \]

• To force extraposition, the subject needs a lot of focus

\[(52) \quad ?(S)_\phi \quad (V)_\phi \quad (\text{that RC})_\phi \]
\[?\text{ajt 'mart-ə} \quad \text{borats [vor hivant er]} \quad \text{that man-INDF who sick is yielded} \]
\[\text{‘That MAN yelled who was sick.’ Այդ մարդը պոռաց որ հիւանդ էր} \]
**Phrasing, not focus**

- Is extraposition about focus?
- No!
- The main correlation between extraposition and phonology is prosodic phrasing, not focus
- In questions, focus is on the questioned word. There is post-focal deaccenting on everything else
- Still get prosodic phrasing + extraposition patterns
Focus is not preverbal

Extraposition on non-focused preverbal constituent

\[(53) \quad (\text{FocS})_\phi (\text{O} \quad V)_\phi (\text{that RC })_\phi
\]

\text{ov namag-mə uni [vor garmir e]}

\text{who letter-INDF has that red is}

‘Who has a letter that is red?’

Մարիան նամակ մը ունի որ կարմիր է
• Focus is not preverbal
• Extraposition on non-focused preverbal constituent

(55) (\text{FocS})_{\phi} (O \quad V)_{\phi} (\text{that} \quad \text{RC} \quad )_{\phi}
\text{ov namag-mə un}i [\text{vor gərmir e}]
\text{who letter-INDF has that red is}

‘Who has a letter that is red?’

(56) (\text{FocS})_{\phi} (O \quad V)_{\phi} (\text{that} \quad \text{RC} \quad )_{\phi}
\text{ma}rja-n \quad \text{namag-mə un}i [\text{vor gərmir e}]
\text{Maria-DEF letter-INDF has that red is}

‘MARIA has a letter that is red.’
Phrasing, not focus

• Focus is not preverbal
• No extraposition on focused constituent

(57) (FocS)φ (O V)φ
ov namag-mə uni
who letter-INDF has

‘Who has a letter?’
Ո՞վ նամակ մը ունի

Մարդ մը որ հիւանդ է նամակ մը ունի

‘AMANTHATISSICK has a letter that is red.’
Phrasing, not focus

- Focus is not preverbal
- No extraposition on focused constituent

(59) \((\text{FocS})_\phi (O \quad V)_\phi\)

who \(\text{namag-mə uni}\)

‘Who has a letter?’

Ո՞վ նամակ մը ունի

(60) \((\text{FocS})_\phi (\text{that RC})_\phi (O \quad V)_\phi\)

\(\text{mart-mə [vəɾ hivant e]} \text{ namag-mə uni}\)

man-INDF that sick is letter-INDF has

‘A MAN THAT IS SICK has a letter that is red.’

Մարդ մը որ հիւանդ է նամակ մը ունի
Focus is preverbal
Extraposition on focused constituent

(61) \[(S)_{\phi} (\text{FocO V})_{\phi}\]

\[
\begin{array}{l}
\text{man-DEF}\ \textit{what} \ \text{has} \\
\text{What does the man have?'}
\end{array}
\]

Մարդը ի՞նչ ունի

Մարդը նամակ մը ունի որ կարմիր է
Phrasing, not Focus

- Focus is preverbal
- Extraposition on focused constituent

(63) $(S)_\phi (\text{FocO } V)_\phi$

\[
\text{мърт-ə intʃ uni}
\]

man-DEF \textbf{what} has

‘What does the man have?’

Մարդը ի՞նչ ունի

(64) $(S)_\phi (O \underline{V})_\phi (\text{that RC } )_\phi$

\[
\text{мърт-ə namag-mə uni [vor garmir e]}
\]

man-DEF letter has that red is

‘The man has A LETTER that is RED.’

Մարդը նամակ մարտ ունի որ կարմիր է
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Cross-linguistically, extraposition is subject to a lot of variables (syntactic, pragmatic, prosodic) (Göbbel, 2020)

For Armenian, it seems extraposition has a single consistent (obligatory) variable:

- a noun’s RC will extrapose
- iff that noun is parsed with the verb’s prosodic phrase
- to create the structure $(NV)_φ(RC)_φ$

Purely prosodically-conditioned extraposition is attested outside of Armenian (Malagasy: Potsdam 2022)
Given our analysis, how can we formalize it? A lot of options...

1. Cyclicity: syntax creates base sentence, then prosodified, then RC is added

   Syntax     N V
   Prosody    (N V)ρ
   Syntax again (N V)ρ (RC)ρ

→ RC is created late in the derivation and cannot modify prosody
Given our analysis, how can we formalize it? A lot of options...

1. Cyclicity: syntax creates base sentence, then prosodified, then RC is added

   Syntax   N V
   Prosody   (N V)\(\phi\)
   Syntax again   (N V)\(\phi\) (RC)\(\phi\)

   \(\Rightarrow\) RC is created late in the derivation and cannot modify prosody

2. Movement: syntax places RC next to noun, but the prosody causes movement

   Syntax   N RC V
   Prosody   (N RC V)\(\phi\)
   Movement   (N V)\(\phi\) (RC)\(\phi\)

   \(\Rightarrow\) RC is moved by the phonology, not the syntax (prosodic movement: Agbayani et al., 2011)
• Syntactic phrases map to prosodic phrases

Syntax $\rightarrow$ Prosody

```
NP
  A N
  |  |  
red letter red letter
```

• Simple Align-L constraint will cause the left of XP to start a $\phi$

<table>
<thead>
<tr>
<th>[red letter]$_{NP}$</th>
<th>Align-L</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. $\ni$ (red letter)$_{\phi}$</td>
<td></td>
</tr>
<tr>
<td>b. red letter</td>
<td>$\ast!$</td>
</tr>
</tbody>
</table>
Mapping a relative clause

- Relative clause starts its own prosodic phrase, without recursive phrasing

Syntax $\rightarrow$ Prosody

```
NP
  N  CP
  \phi  \phi
  letter  RC
  letter  RC
```

- A constraint NONREC helps blocks recursive phrasing

<table>
<thead>
<tr>
<th>[letter [RC]__{CP}__NP]</th>
<th>NonRec</th>
<th>Align-L</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. (letter RC)_____φ</td>
<td></td>
<td>*!</td>
</tr>
<tr>
<td>b. (letter (RC)___φ)φ</td>
<td>*!</td>
<td></td>
</tr>
<tr>
<td>c. (letter)___φ (RC)__φ</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Mapping a verb phrase

- Verbs want to phrase with the preverbal item. Verb cannot be its own separate phrase.

Syntax $\rightarrow$ Prosody

\[
\begin{array}{c}
\text{VP} \\
\text{NP} \quad \text{V} \\
\text{letter} \quad \text{has} \quad \text{letter} \quad \text{has}
\end{array}
\]

- A constraint ARGUMENT prefers that the N + V unit is one phrase (Clemens, 2019). Will be useful later.

<table>
<thead>
<tr>
<th>[[letter]$<em>{NP}$ has]$</em>{VP}$</th>
<th>Argument-$\phi$</th>
<th>NonRec</th>
<th>Align-L</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. (letter has)$_{\phi}$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. ((letter)$<em>{\phi}$ has)$</em>{\phi}$</td>
<td></td>
<td></td>
<td>*!</td>
</tr>
<tr>
<td>c. (letter)$<em>{\phi}$ (has)$</em>{\phi}$</td>
<td></td>
<td></td>
<td>*!</td>
</tr>
</tbody>
</table>
**Formalizing extraposition**

- Verb forces extraposition because a) verb wants to phrase with noun, and b) we avoid recursive phrasing

Syntax → Prosody

![Diagram of Syntax and Prosody](image)

- Movement violates a **STAY** constraint

<table>
<thead>
<tr>
<th>[[letter [RC]_{CP} NP has]_V P</th>
<th>Argument-φ</th>
<th>NonRec</th>
<th>Align-L</th>
<th>Stay</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. (letter RC has)_φ</td>
<td></td>
<td></td>
<td></td>
<td>*!</td>
</tr>
<tr>
<td>b. (letter RC) (has)</td>
<td>*!</td>
<td></td>
<td></td>
<td>*!</td>
</tr>
<tr>
<td>c. (letter) (RC) (has)</td>
<td>*!</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. (letter) (RC has)</td>
<td>*!</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. (letter _ has) (RC)</td>
<td></td>
<td></td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>
TABLE OF CONTENTS

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- Syntax and prosodic phrasing
- Extraposition
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  - Ditransitive verbs
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Conclusion and next steps

- Extraposition in Western Armenian is conditioned by prosodic structure (= verb is parsed with its preverbal argument)
- Of course, pragmatics (topicalization) can affect prosody and thus affect extraposition
- Only looked at Western Armenian, but Eastern Armenian behaves the same
- Questions for the future
  - Is prosodically-conditioned extraposition also found in the LACIM region?
  - Maybe an experiment?
References


**Mapping a noun phrase**

- Syntactic phrases map to prosodic phrases

  Syntax  $\rightarrow$  Prosody

  $\text{NP} \quad \phi$

  $A \quad N$

  $\text{red letter} \quad \text{red letter}$

- Simple Match constraint will match an XP with a $\phi$

<table>
<thead>
<tr>
<th>red letter</th>
<th>Match-XP-$\phi$</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. $\phantom{\text{red letter}} (\text{red letter})_\phi$</td>
<td></td>
</tr>
<tr>
<td>b. red letter</td>
<td>*!</td>
</tr>
</tbody>
</table>
Mapping a relative clause

- Relative clause wants to be its own prosodic phrase, to avoid recursive phrasing.

**Syntax → Prosody**

```
NP
   N CP
      φ φ
  letter RC
```

- A constraint NONREC blocks recursive phrasing, but we probably still need alignment.

<table>
<thead>
<tr>
<th>letter RC</th>
<th>NonRec</th>
<th>Match-XP-φ</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. ⚫ (letter RC) φ</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>b. (letter (RC) φ)</td>
<td>!</td>
<td></td>
</tr>
<tr>
<td>c. (letter) φ (RC) φ</td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>
**Mapping a Verb Phrase**

- Verbs want to phrase with the preverbal item. Verb cannot be its own separate phrase.

Syntax $\rightarrow$ Prosody

$$\begin{array}{c}
\text{VP} \\
| \text{NP} | \text{V} \\
\mid \text{letter} | \text{has} \\
\end{array} \quad \phi \\
\begin{array}{c}
\mid \text{ω} | \text{ω} \\
\text{letter} | \text{has} \\
\end{array}$$

- A constraint ARGUMENT prefers that the N + V unit is one phrase (Clemens, 2019)

<table>
<thead>
<tr>
<th>letter has</th>
<th>NonRec</th>
<th>Argument-$\phi$</th>
<th>Match-XP-$\phi$</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. $\not\in \phi$ (letter has)$_\phi$</td>
<td></td>
<td></td>
<td>$\ast$</td>
</tr>
<tr>
<td>b. $\not\in \phi$ ((letter) has)$_\phi$</td>
<td>$\ast$!</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. $\not\in \phi$ (letter)$<em>\phi$ (has)$</em>\phi$</td>
<td>$\ast$!</td>
<td></td>
<td>$\ast$</td>
</tr>
</tbody>
</table>
**Formalizing extraposition**

- Verb forces extraposition because a) verb wants to phrase with noun, and b) we avoid recursive phrasing

**Syntax → Prosody**

- Movement violates a **Stay** constraint

<table>
<thead>
<tr>
<th>letter RC has</th>
<th>NonRec</th>
<th>Argument-φ</th>
<th>Match-XP-φ</th>
<th>Stay</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. (letter RC has)</td>
<td></td>
<td></td>
<td><strong>!</strong></td>
<td></td>
</tr>
<tr>
<td>b. ((letter (RC)) has)</td>
<td><strong>!</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. (letter) (RC) (has)</td>
<td></td>
<td><strong>!</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. (letter) (RC has)</td>
<td></td>
<td><strong>!</strong></td>
<td><strong>!</strong></td>
<td></td>
</tr>
<tr>
<td>e. (letter _ has) (RC)</td>
<td></td>
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