Representation vs. Procedure: Outwardly-sensitive allomorphy in Armenian

Hossep Dolatian

Stony Brook University

Nov 24, 2021
Table of Contents

Introduction

Typical alternations: possessive suffixes

Atypical alternation

- Outwardly-sensitive allomorphy
- Reduction to abstract representations

Extending atypicality

- Phrasal resyllabification in Eastern
- Double-docking in Iranian

Discussion
Title: *Representation vs. Procedure: Outwardly-sensitive allomorphy in Armenian*

Data: Look at definite suffix in Armenian (IE) across 3 lects

Generalization: Choice of surface form depends on preceding and following segments

→ Outwardly-sensitive allomorphy

Choice of analysis:

- **Procedural** solution: Assume late spell-out of outwardly-sensitive morphemes (Henderson, 2012)
- **Representational** solution: Assume abstract segments in underlying forms (Ulfsbjorninn, 2020)

→ Argue for complicated representations, instead of complicated procedures

→ Reduce outwardly-sensitive allomorphy to floating segments
Basic terms

- **Allomorphy**: a morpheme has different surface forms, derived from separate underlying forms
  - English comparative *-er* vs. *most*

- **Alternation**: a morpheme has different surface forms, derived from either allomorphy or just phonology
  - English plural *-s, -z, -əz* from */-z/*

- Throughout talk will focus on phonologically-conditioned allomorphy/alternations
Introduction

Typical alternations: possessive suffixes

Atypical alternation
- Outwardly-sensitive allomorphy
- Reduction to abstract representations

Extending atypicality
- Phrasal resyllabification in Eastern
- Double-docking in Iranian

Discussion
**Typicalities in allomorphy**

- Typical alternation: Form is chosen based on segments that are structurally **lower**
- Syllable-counting allomorphy in Saami tries to create even-syllable word (Paster, 2006, 149)

<table>
<thead>
<tr>
<th>Even base</th>
<th>Odd base</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passive (je:r.ro.-juv.vo)</td>
<td>veah.ke.hu-(v.vo)</td>
</tr>
<tr>
<td>2du (jear.ra.-beaht.ti)</td>
<td>veah.ke.hea-(hp.pi)</td>
</tr>
<tr>
<td>Pass-2du (je:r.ro-juv.vo-beaht.ti)</td>
<td>(\ast je:r.ru-v.vo-hp.pi)</td>
</tr>
</tbody>
</table>

- When have two syllable-counting suffixes, each suffix looks only leftwards
Typicalities in allomorphy

- Typical alternation: Trigger for the chosen form can become opaque
- Turkish possessive suffix has allomorph based on C/V-final base (Paster, 2006, 69)
  
  \[
  \begin{array}{ll}
  V_{-i} & C_{-si} \\
  \text{bedel-i} & \text{fire-si} \\
  /\text{ağlık-i}/ & \\
  açlı-i & *açlı-sı \\
  \end{array}
  \]

- Intervocalic \( k \) is later deleted, making the choice of allomorphs opaque
  
  → Early allomorphy can become opaque because of later phonology
What’s a typical alternation?

- A phonologically-conditioned alternation is typical if:
  1. conditioned by the input phonology, not output phonology
  2. conditioned by morphologically-internal morphemes, not external
  3. can be made opaque via cyclicity

- All 3 qualities are found in possessive suffixes in Western Armenian
Western Armenian

- Western Armenian is an Armenian lect that developed in the Ottoman Empire
- Now primarily a diasporic language in Lebanon + Syria + elsewhere
- Data primarily from my judgments, supplemented by grammars
Possessive Suffixes

- 1SG possessive suffix is -s after V, and -əs after C
  
<table>
<thead>
<tr>
<th>'cat'</th>
<th>'amount'</th>
</tr>
</thead>
<tbody>
<tr>
<td>gadu</td>
<td>[ga.du]</td>
</tr>
<tr>
<td>'my X'</td>
<td>gadu-s</td>
</tr>
<tr>
<td>'your X'</td>
<td>gadu-tʰ</td>
</tr>
</tbody>
</table>

- 2SG possessive is -(ə)tʰ with same distribution

- Is this allomorphy or just phonology or in between?
  - Boundary-sensitive phonology
Explaining possessives

- In a root, complex codas are licit when falling-sonority:

  \[ rs# \quad js# \quad rt# \quad jt# \quad nt# \]

  \[ hars \quad hujs \quad marth \quad ajth \quad linth \]

  ‘bride’ ‘hope’ ‘man’ ‘that’ ‘gum’

- So no phonotactic reason why 1SG poss -s triggers a schwa:

  \[ r-\text{o}s \quad j-\text{o}s \]

  ‘X’ \quad \text{p}^h\text{ar} \quad \text{xoj}

  ‘my X’ \quad \text{p}^h\text{ar-}\text{o}s \quad \text{xoj-}\text{o}s

  \*\text{p}^h\text{ar-}s \quad \text{xoj-}s

  ‘word’ ‘ram’

- Same goes for 2SG:

  \[ r-\text{o}t \quad j-\text{o}t \quad n-\text{o}t \]

  \[ \text{p}^h\text{ar} \quad \text{xoj} \quad \text{p}^h\text{an} \]

  ‘X’ \quad \text{p}^h\text{ar-}\text{o}t^h \quad \text{xoj-}\text{o}t^h

  ‘my X’ \quad \text{p}^h\text{an-}\text{o}t^h

  ‘word’ ‘ram’ ‘thing’
MORPHEME BOUNDARIES

- No purely phonological reason why $rs$ can be complex coda in roots but not across possessive boundary
  
  ‘cat’
  
  ‘amount’
  
  ‘X’    $\text{gadu}$    [ga.du]    $k^h\text{umar}$    [k$^h$u.mar]
  
  ‘my X’    $\text{gadu-s}$    [ga.dus]    $k^h\text{umar-ēs}$    [k$^h$u.mā.ēs]
  
  ‘your X’    $\text{gadu-t}^h$    [ga.dut$^h$]    $k^h\text{umar-ēt}^h$    [k$^h$u.mā.ēt$^h$]

- Generalization: can’t form complex coda across a morpheme boundary

- $^*\text{C-C]}^\sigma$: A complex coda can’t have consonants with different morphological colors

<table>
<thead>
<tr>
<th></th>
<th>$^*\text{C-C]}^\sigma$</th>
<th>DEP-ē</th>
</tr>
</thead>
<tbody>
<tr>
<td>$/k^h\text{umar-s}/$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. $k^h\text{u.mars}$</td>
<td>*!</td>
<td></td>
</tr>
<tr>
<td>b. $k^h\text{u.mā.ēs}$</td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>
Opacity of possessive

- So far, possessive is -C after V, but -וש C after C
- Schwa used to avoid making a complex coda
  - ‘cat’ ‘amount’
  - ‘X’  
    - ‘my X’  
    - ‘your X’
  -  
    -  
    -  
    -  
- Get opacity once you add V-initial clitics
Opacity of possessive

- Clitics epenthesize \( j \) after vowels, but resyllabify consonants
  - ‘cat’
  - ‘amount’
  - ‘X’  \( \text{gadu} \)  [\text{ga.du}]  \( k^h\text{umar} \)  [\text{k}^h\text{u.mar}]  
  - ‘is X’  \( \text{gadu}[j]=e \)  [\text{ga.du.je}]  \( k^h\text{uma}.r=e \)  [\text{k}^h\text{u.ma.re}]

- For Poss+Clitic, the suffix is resyllabified and the schwa stays

See this for 1SG

- ‘cat’
- ‘amount’
- ‘my X’  \( \text{gadu-}\text{s} \)  [\text{ga.dus}]  \( k^h\text{umar-}\text{øs} \)  [\text{k}^h\text{u.ma.\text{ø}s}]  
- ‘is my X’  \( \text{gadu-}\text{s}=e \)  [\text{ga.du.se}]  \( k^h\text{umar-}\text{øs}=e \)  [\text{k}^h\text{u.ma.\text{ø}s.e}]

And 2SG

- ‘cat’
- ‘amount’
- ‘your X’  \( \text{gadu-}\text{th} \)  [\text{ga.dut}^h]  \( k^h\text{umar-}\text{øth} \)  [\text{k}^h\text{u.ma.\text{ø}th}]  
- ‘is your X’  \( \text{gadu-}\text{th}=e \)  [\text{ga.du.t}^h\text{e}]  \( k^h\text{umar-}\text{øth}=e \)  [\text{k}^h\text{u.ma.\text{ø}th.e}]
Clitic opacity

- Zooming in on C-final words, the phonology of possessive and clitics is opaque

  \[\text{‘amount’} \quad \text{/}k^h\text{umar-s=es}/\]

  my X \( k^h\text{umar-əs} \quad [k^h\text{u.mə.rəs}] \)

  is my X \( k^h\text{umar-əs=e} \quad [k^h\text{u.mə.rə.se}] \quad *k^h\text{umar.se} \)

- Root+Poss: Add a schwa to avoid making a complex coda
  - \( /k^h\text{umar-s}/ \rightarrow [k^h\text{u.mə.rəs}] \)

- Root+Poss+Clitic: Resyllabify the Poss but then the schwa is ‘unneeded’
  - \( /k^h\text{umar-s=es}/ \rightarrow [k^h\text{u.mə.rə.se}] \)

- The schwa surfaces in the possessive even though it’s phonologically unmotivated on the surface
  - \( /k^h\text{umar-s=es}/ \rightarrow *[k^h\text{umar.se}] \)

- We can see this better with cyclic models...
Cyclic opacity

- If we try to derive root+Poss+Clitic in one cycle, then we can’t generate the schwa

| /kʰumar-s=e/ | *C-C|σ | DEP-ə |
|---|---|---|
| a. ☞ kʰu.mär.se | | |
| b. ☹ kʰu.ma.rə.se | *! |

- Need to generate the Poss and Clitic in two separate cycles
  1. **Lexical level**

| /kʰumar-s/ | *C-C|σ | DEP-ə |
|---|---|---|
| a. kʰu.mars | *! |
| b. ☞ kʰu.ma.rəs | * |

  2. **Post-lexical level**

| //kʰu.ma.rəs=e/ | *C-C|σ | DEP-ə | MAX |
|---|---|---|---|
| a. ☞ kʰu.ma.rə.se | | | |
| b. kʰu.mar.se | | | *! |
Typicality of opacity

- Cliticized possessives require at least two cycles of computation
- First cycle determines the phonological shape of the possessive
  \[/k^humar-s/ \rightarrow //k^huma.r\emptyset// \text{‘my amount’}\]
- Second cycle masks the reason why the possessive looks the way it does
  \[//k^huma.r\emptyset=e// \rightarrow [k^huma.r\emptyset.e] \text{‘is my amount’}\]
- Cyclically-induced opacity
- Cross-linguistically common to have earlier allomorphy/phonology becoming opaque from post-lexical process (Paster, 2006)
Table of Contents

- **Introduction**

- **Typical alternations: possessive suffixes**

- **Atypical alternation**
  - Outwardly-sensitive allomorphy
  - Reduction to abstract representations

- **Extending atypicality**
  - Phrasal resyllabification in Eastern
  - Double-docking in Iranian

- **Discussion**
What is atypicality

• Possessive data fit the 3 criteria for a typical alternation
  1. conditioned by the input phonology, not output phonology (root-final consonant)
  2. conditioned by morphologically-internal morphemes, not external (ignores clitics)
  3. can be made opaque via cyclicity (unneeded schwa in cliticization)

→ Need a vanilla morphology-phonology architecture that’s cyclic and input-based

• But Western Armenian also has an atypical alternation for the definite suffix

• The definite suffix violates all 3 criteria
Definite suffix in Western

- Possessive suffixes utilized two surface forms based on C/V conditions
  - 1SG: V-\textit{s} and C-\textit{æ}s from /-s/ 
  - 2SG: V-\textit{t} \textsuperscript{h} and C-\textit{æ}t \textsuperscript{h} from /-t \textsuperscript{h}/
- These surface forms are similar enough that they utilize one underlying allomorph
- The definite suffix has two surface forms with the above same distribution, ...
- But the surface forms are dissimilar
  
  `cat`     `amount`
  `X`       \textit{gadu} [\textit{ga.du}] \textit{k} \textsuperscript{h} \textit{umar} [\textit{k} \textsuperscript{h} \textit{u.mar}]
  `the X`    \textit{gadu-n} [\textit{ga.dun}] \textit{k} \textsuperscript{h} \textit{umar-æ} [\textit{k} \textsuperscript{h} \textit{u.mar.æ}]`
On the surface, the definite forms seem to be allomorphy

- ‘cat’
- ‘amount’
- ‘X’
- ‘the X’

Can easily capture this with two underlying allomorphs /-n, -ə/ that compete together, whether in serial or parallel

Serial version with subcategorization frames...

\[
\text{DEF} \rightarrow -n \quad / V_-
\]
\[
-ə \quad / C_-
\]
Naive Allomorphy – Parallelist

- Modeling the simple distribution via allomorphy is trivial
- For V-final bases, use -n to avoid V-V hiatus

| /gədʊ-{ə,n}/ | *C-C|σ | ONSET | DEP-ə |
|-----------------|------|--------|--------|
| a. ə n | ga.dun |  |  |
| b. ga.du.ə |  | *! |  |

- For C-final bases, use -ə to avoid complex codas

| /kʰumər-{ə,n}/ | *C-C|σ | ONSET | DEP-ə |
|-----------------|------|--------|--------|
| a. kʰu.mən |  | *! |  |
| b. kʰu.mə.ən |  |  | *! |
| c. n kʰu.mə.ə |  |  |

- Using -n would trigger epenthesis (e)
So far everything seems trivial. Definite forms are transparently formed by basic allomorphy competition.

But things gets complicated in cliticization.

- ‘cat’
  ‘the X’ $gādu-n$ $[gā.dun]$ $k^{h}umār-ə$ $[k^{h}u.mā.rə]$
  ‘is the X’ $gādu-n=ə$ $[gā.du.ne]$ $k^{h}umār-n=ə$ $[k^{h}u.mār.ne]$

- The definite suffix is -$ə$ after $C$, but switches to -$n$ before $V$ clitics.

- Distribution is conditioned by preceding and following material:
  $\text{DEF} \rightarrow \begin{array}{cc}
  -n & / \text{V}_{-} \\
  -n & / \underline{=}\text{V} \\
  -ə & / \text{elsewhere}
  \end{array}$

$\rightarrow$ phonologically-conditioned allomorphy is outwardly-sensitive
Possessive vs. definite

- Zooming in on C-final words, the definite suffix switches when uncliticized vs. cliticized

  ‘amount’
  ‘the X’  $k^humar-\partial$  [k^huma.r\partial]
  ‘is the X’  $k^humar-n=e$  [k^huma.r.ne]
  *$k^humar-\partial[j]=e$

- This is the opposite behavior of the possessive suffixes which stay stable

  ‘amount’
  ‘my X’  $k^humar-\partial$  [k^huma.r\partial]s
  ‘is my X’  $k^humar-\partial$  =e  [k^huma.r\partial.se]
  $k^humar-s$ =e
For the definite suffix, a cyclic derivation with allomorphs /-ə, -n/ fails under cliticization

1. *Lexical level:*

| /kʰu.mər-{ə,n}/ | *C-C|σ | Onset | Dep-j |
|-----------------|--------|-------|-------|
| a. kʰu.mərn     | *!     |       |       |
| b. kʰu.mərə      |         |       |       |

2. *Post-lexical level:*

| //kʰu.ma.rə=e// | *C-C|σ | Onset | Dep-j |
|----------------|--------|-------|-------|
| a. kʰu.ma.rə.e | *!     |       |       |
| b. kʰu.ma.rə.je |         |       | *     |

The definite suffix seems to require a single cycle

- *Late spell-out*

| /kʰu.mər-{ə,n}=e/ | *C-C|σ | Onset | Dep-j |
|-------------------|--------|-------|-------|
| a. kʰu.mər.ə.e    | *!     |       |       |
| b. kʰu.mər.ə.je   |         |       | *!    |
| c. kʰu.mər.ne     |         |       |       |
• Given out simple allomorphy analysis of definite as /-ə, -n/, we have to stipulate that

1) Definite suffix is exponed late in the derivation (post-cyclic), while
   ‣ /kʰumar-{ə,n}=e/ → [kʰumar-n=e]

2) Possessive suffixes are exponed early in the derivation (cyclic)
   ‣ /kʰumar-s=e/ → [kʰumar-əs] → [kʰumar-əs=e]

• Cyclicity is often argued for allomorphy, but we rarely find evidence of non-cyclic super-late spell-out
• Some have argued that some morphemes get exponed exceptionally late
  ‣ clause-edge conditioned allomorphy (Henderson, 2012)
  ‣ phrasal allomorphy (Hannahs and Tallerman, 2006)
• For Armenian...
  ‣ Need to use a basic cyclic model for the phonology,
  ‣ And a late spell-out diacritic/instruction for the definite suffix
Definite morphology

- Definite suffix has [+late spell-out] diacritic, but this diacritic doesn’t fall from any thing else but is entirely arbitrary
- Extra weird because definite suffix is in the same morphological slot as possessives
  - Def and Poss suffixes can’t co-occur
  - 3SG possession is marked by just the Def suffix
    - Pronoun Root-Suffix
      - ‘my amount’  \( im \ k^h u\text{mar-ə} \)
      - ‘your amount’  \( ku \ k^h u\text{mar-ət}^h \)
      - ‘his amount’  \( ir \ k^h u\text{mar-ə} \)
      - ‘our amount’  \( mer \ k^h u\text{mar-ə} \)
- No reason why the definite suffix gets late spell-out, while the possessive’s get normal cyclic spell-out
Procedural hack

- A ‘late spell-out’ diacritic is a **procedural** strategy to explain phrase-level or outwardly-conditioned allomorphy
- But it’s unclear how to control what gets a ‘late spell-out’ diacritic
- Misses the fact that, by and large, allomorphy respects the lexical-postlexical divide
- Further, the hack has to be unique to this definite suffix
- **Morale:**
  - We can describe the atypical alternation of the definite suffix using late spell-out diacritics
    - But it doesn’t explain anything or make any predictions
- **Next-up:** Argue that we don’t need this procedural hack, but use latent segments
Latent segments

- The roadblocks is complicating the procedure of spell-out and cyclicity.
- Roadblock exists because of the representation of the definite suffix as two allomorphs /-ə, -n/.
- But we can maintain our vanilla procedure if we use more abstract representation...
- Argument: the definite suffix is a sequence of floating segments /-(ə)(n)/.
- Contrast possessive suffixes which have only non-floating segments /-s/ and /-tʰ/.

\[
\begin{align*}
\text{DEF} & \leftrightarrow \ -\emptyset \ n & \text{1SG.POSS} & \leftrightarrow \ -s
\end{align*}
\]
Lexical vs. Post-lexical divide

- Representationally, the definite has floating segments
- Procedurally, keep our vanilla cyclic model, but also assume that...
  1) Lexical stratum (root+poss/def) let floaters float
  2) Post-lexical stratum (root+poss/def+clitic) must dock floaters

<table>
<thead>
<tr>
<th></th>
<th>Root + Poss</th>
<th>Root + Def</th>
<th>Root + Def + Clitic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lexical</td>
<td>/kʰumar-s/</td>
<td>/kʰumar-(ə)(n)/</td>
<td>/kʰumar-(ə)(n)/</td>
</tr>
<tr>
<td>Epenthesis</td>
<td>[kʰumar-əs]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-lexical</td>
<td></td>
<td>/kʰumar-(ə)(n)/</td>
<td>/kʰumar-(ə)(n)=e/</td>
</tr>
<tr>
<td>Docking</td>
<td></td>
<td>[kʰumar-ə]</td>
<td>[kʰumar-n=e]</td>
</tr>
</tbody>
</table>

- Balancing representation and procedure will let us derive everything
Lexical stratum

- Focus on C-final definite words
- In lexical stratum, the definite suffix is added but stays floating

‘the amount’

Lexical input /kʰūmar-(ə)(n)/
Lexical output //kʰūmar-(ə)(n)//

- Constraints against docking outrank constraints for docking
  - Dep(skel) & Max(mel) >> Parse
  - Don’t dock & Don’t delete floater >> No floaters

<table>
<thead>
<tr>
<th>/kʰūmar-(ə)(n)/</th>
<th>Dep(skel)</th>
<th>Max(mel)</th>
<th>Parse</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>kʰu.mar-(ə)(n)</td>
<td></td>
<td>**</td>
</tr>
<tr>
<td>b.</td>
<td>kʰu.ma.rən</td>
<td><em>!</em></td>
<td></td>
</tr>
<tr>
<td>c.</td>
<td>kʰu.ma.rə</td>
<td>*!</td>
<td>*!</td>
</tr>
<tr>
<td>d.</td>
<td>kʰu.marən</td>
<td>*!</td>
<td>*!</td>
</tr>
<tr>
<td>e.</td>
<td>kʰu.mar</td>
<td></td>
<td>**</td>
</tr>
</tbody>
</table>
Post-lexical stratum - no clitic

- In the post-lexical stratum, the definite suffix must dock ‘the amount’

  Post-lexical input  //kʰumar-(ə)(n)//
  Post-lexical output /kʰumar-ə//

- Constraints for docking outweigh constraints against docking
  - Parse >> Dep(skel) >> Max(mel)

- If the word is uncliticized, the schwa is docked to avoid a complex coda, while the nasal is deleted

<table>
<thead>
<tr>
<th>//kʰumar-(ə)(n)//</th>
<th>Parse</th>
<th>*C-C</th>
<th>σ</th>
<th>Onset</th>
<th>Dep(skel)</th>
<th>Max(mel)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. kʰu.mar-(ə)(n)</td>
<td>!*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. kʰu.ma.ɾən</td>
<td></td>
<td>!**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. kʰu.ma.ɾə</td>
<td></td>
<td>*</td>
<td></td>
<td></td>
<td>!*</td>
<td></td>
</tr>
<tr>
<td>d. kʰu.mɑn</td>
<td>!*</td>
<td></td>
<td></td>
<td></td>
<td>*</td>
<td>!*</td>
</tr>
<tr>
<td>e. kʰu.mar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>!*</td>
<td></td>
</tr>
</tbody>
</table>

- This leads to appearance of a typical alternation: inwardly-conditioned allomorphy
Post-lexical stratum – clitics

- Things get funny when you have a clitic
  
  ‘the amount’  ‘is the amount’
  
  UR /kʰumar-(ə)(n)/  /kʰumar-(ə)(n)=e/
  SR [kʰumar-ə]  [kʰumar-n=e]
  
- The nasal will dock to provide an onset, while the schwa will delete because it is unneeded

<table>
<thead>
<tr>
<th>//kʰu.mar-(ə)(n)=e//</th>
<th>PARSE</th>
<th>*C-C</th>
<th>σ</th>
<th>Onset</th>
<th>Dep(skel)</th>
<th>NoCoda</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.  kʰu.mar-(ə)(n)=e</td>
<td><em>!</em></td>
<td>*</td>
<td></td>
<td></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>b.  kʰu.ma.ə.ne</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>**!</td>
<td></td>
</tr>
<tr>
<td>c.  kʰu.ma.ə.e</td>
<td></td>
<td>*!</td>
<td></td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d.  kʰu.mar.ne</td>
<td></td>
<td></td>
<td></td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>e.  kʰu.ma.re</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- This leads to appearance of an atypical alternation: outwardly-sensitive allomorphy
We looked at an atypical alternation where we see inwardly and outwardly-conditioned allomorphy.

Having a suffix switch shapes across cycles is cross-linguistically atypical, but it happens:

- ‘amount’
  - ‘the X’ \(k^h u.mar-\emptyset\) \([k^h u.ma.r\emptyset]\)
  - ‘is the X’ \(k^h u.mar-n=\emptyset\) \([k^h u.mar.ne]\)

We could handle this by complicating either our:
  - Procedure/Derivation: Definite suffix is allowed to spell-out late
  - Representation: Definite suffix has floating segments

Conceptually, a representation solution is ‘nicer’, but there’s also evidence for it across dialects:
  - Eastern Armenian: phrasal resyllabification feeds definite docking
  - Iranian Armenian: both floaters can dock
Eastern Armenian

- Eastern Armenian is an Armenian koine developed around Georgia and Armenia during the Russian Empire
- Some degree of intelligibility with Western Armenian
- Currently the official language of Armenia
- Data from fieldwork on speakers from Yerevan (the capital) in California, and their families
- Supplemented with data from published (Soviet) grammars
Eastern pattern

- Both Western and Eastern use the same possessive suffixes and definite suffixes.
- Got same distribution for cliticized and uncliticized words.
- Focusing just on C-final words, possessive is stable before clitics.

<table>
<thead>
<tr>
<th>Word</th>
<th>Western</th>
<th>Eastern</th>
</tr>
</thead>
<tbody>
<tr>
<td>'amount'</td>
<td>$k^humar$</td>
<td>gumar</td>
</tr>
<tr>
<td>'my amount'</td>
<td>$k^humar-@s$</td>
<td>gumar-@s</td>
</tr>
<tr>
<td>'is my amount'</td>
<td>$k^humar-@s=e$</td>
<td>gumar-@s=e</td>
</tr>
<tr>
<td>'amount'</td>
<td>$k^humar$</td>
<td>gumar</td>
</tr>
<tr>
<td>'the amount'</td>
<td>$k^humar-@$</td>
<td>gumar-@</td>
</tr>
<tr>
<td>'is the amount'</td>
<td>$k^humar-n=e$</td>
<td>gumar-n=e</td>
</tr>
</tbody>
</table>

- The definite suffix behaves the same for the two lects: switches to -n before clitics.

- So far, no dialectal differences.
Dialectal differences emerge in connected speech.

For Western, the definite suffix switches to -n before V-initial clitics, but not before V-initial lexical words:

- **Western**
  - ‘the amount’  
    - $k^humar-\varepsilon$  
    - [kʰu.mᵃ.rə]
  - ‘is the amount’  
    - $k^humar-n=ɛ$  
    - [kʰu.mᵃ.rə.ne]
  - ‘took the amount’  
    - $k^humar-\varepsilon\ ari$  
    - [kʰu.mᵃ.rə\ aɾi]

In Eastern, we see the switch before either clitics or words:

- **Eastern**
  - ‘the amount’  
    - $gumar-\varepsilon$  
    - [gu.mᵃ.rə]
  - ‘is the amount’  
    - $gumar-n=ɛ$  
    - [gu.mar.ne]
  - ‘took the amount’  
    - $gumar-n\ ara$  
    - [gu.mar.nᵃ.ɾə]
Allomorphy of connected speech

- Generalization is that the definite suffix is outwardly-sensitive to lexical words in Eastern but not Western.

<table>
<thead>
<tr>
<th></th>
<th>Isolation</th>
<th>Cliticized</th>
<th>Connected speech</th>
</tr>
</thead>
<tbody>
<tr>
<td>V_</td>
<td>C_</td>
<td>C_ = V</td>
<td>C_ # V</td>
</tr>
<tr>
<td>Western</td>
<td>-n</td>
<td>-n</td>
<td>-n</td>
</tr>
<tr>
<td>Eastern</td>
<td>-n</td>
<td>-n</td>
<td>-n</td>
</tr>
</tbody>
</table>

- Question: Why do we have this sensitivity? And why in one dialect but not the other?

→ Eastern has phrasal resyllabification while Western does not!
Phrasal resyllabification

- In Western Armenian, speakers don’t report ‘perceived’ resyllabification, while Eastern speakers do.

- Consider possessive -s

<table>
<thead>
<tr>
<th>Eastern Armenian</th>
<th>Western Armenian</th>
</tr>
</thead>
<tbody>
<tr>
<td>katu-s ara</td>
<td>gadu-s ari</td>
</tr>
<tr>
<td>[ka.tu sa.ra]</td>
<td>[ga.dus. a.ri]</td>
</tr>
</tbody>
</table>

Gloss: cat=my bought.PST1SG  cat=my took.PST1SG
Translation: ‘I bought my cat.’  ‘I took my cat.’

- Judgements are impressionistic, so need to use a grain of salt.
More evidence that resyllabification matters come from variable clitics (data from Western)

The morpheme ‘is’ =e always resyllabifies with its left-adjacent word

This morpheme is always a phonological clitic and feeds definite allomorphy

But some morphemes are variably clitics – can variably syllabify with left-adjacent word

Variability feeds or bleeds definite allomorphy
Given a resyllabification analysis, we can straightforwardly explain dialectal variation.

In Eastern Armenian, phrasal resyllabification is active: \textsc{Onset} outranks \textsc{Align-L}.

Resyllabification allows the definite suffix to be sensitive to the following word.

<table>
<thead>
<tr>
<th>//gu.mar-(ə)(n) a.ra//</th>
<th>Parse</th>
<th>*C-C$_\sigma$</th>
<th>Onset</th>
<th>Align</th>
<th>Dep(skel)</th>
<th>NoCoda</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. gu.mar-(ə)(n) a.ra</td>
<td>!*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>c. gu.marə    na.ra</td>
<td></td>
<td></td>
<td>!*</td>
<td></td>
<td>**!</td>
<td></td>
</tr>
<tr>
<td>d. gu.marə    a.ra</td>
<td></td>
<td>!*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. gu.mar     na.ra</td>
<td></td>
<td>!*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Resyllabification constraints**

- In Western, phrasal resyllabification is inactive via the reverse ranking
- So non-cliticized words don’t feed definite allomorphy

| //kʰu.mar-(ə)(n) a.ri// | PARSE | *C-C|σ | ALIGN | Onset | Dep(skel) | NoCoda |
|------------------------|-------|------|-------|-------|---------|---------|
| a. kʰu.mar-(ə)(n) a.ri | *!*   |       |       | *     |         | *       |
| c. kʰu.ma.rə na.ri    |       | *!   |       |       | **      |         |
| d. kʰu.ma.rə a.ri    |       |       | *     |       |         |         |
| f. kʰu.mar na.ri      |       | *!   |       |       | *       |         |
Focus

- Even more evidence for resyllabification comes from focus
- In Eastern Armenian, the definite is sensitive to the following word
- But focal pauses block resyllabification and block definite allomorphy

(1) gu.mar-n a.ra
    amount-DEF bought.PST1SG
    ‘I bought the amount.’

(2) gu.mär-ə a.ra
    amount-DEF bought.PST1SG
    ‘I BOUGHT the amount.’

- Can capture data with a higher-ranked ALIGN-FOC constraint that blocks resyllabification of focused words
Dialects differ in that the definite suffix is sensitive to a following V-initial word in Eastern but not Western Armenian.

Empirically, these facts align with phrasal resyllabification.

For our **Representational** solution, we can explain the alternation by appealing to resyllabification.

For a **Procedural** solution like late spell-out, we can use the phrasal resyllabification analysis too...

But we can also just make up extra diacritics like ‘*late spell-out within cliticized phrases but not phrases*’

The Representational solution is more restrictive because it allows fewer analytical loopholes.
More direct evidence for latent segments comes from Iranian Armenian.

In Iran, the Armenian community is triglossic:

- Persian with non-Armenians
- Eastern Armenian as formal register among Armenians
- Iranian Armenian as informal register among Armenians

Data from fieldwork on community in California.
Across the three lects definite suffix is -n after vowels, -ә after consonants

<table>
<thead>
<tr>
<th></th>
<th>Western</th>
<th>Eastern</th>
<th>Iranian</th>
</tr>
</thead>
<tbody>
<tr>
<td>C_V</td>
<td>gadu-n</td>
<td>katu-n</td>
<td>kάtu-n</td>
</tr>
<tr>
<td>V_C</td>
<td>kʰumar-ә</td>
<td>gumar-ә</td>
<td>gumar-ә</td>
</tr>
<tr>
<td>V_V</td>
<td>gadu-n=ә</td>
<td>katu-n=ә</td>
<td>kάtu-n=ә</td>
</tr>
</tbody>
</table>

But between a C and a V, the definite switches to -n in Western and Eastern

While in Iranian, the suffix becomes -әn

<table>
<thead>
<tr>
<th></th>
<th>Western</th>
<th>Eastern</th>
<th>Iranian</th>
</tr>
</thead>
<tbody>
<tr>
<td>C_V</td>
<td>kʰumar-н=ә</td>
<td>gumar-н=ә</td>
<td>gumar-ә=п</td>
</tr>
</tbody>
</table>

‘the cat’

‘the amount’

‘is the cat’

‘is the amount’
Definite in Iranian

- For Western and Eastern, the suffix is always exponed by a single surface segment, but Iranian has two segments before clitics

<table>
<thead>
<tr>
<th></th>
<th>Western</th>
<th>Eastern</th>
<th>Iranian</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘the amount’</td>
<td>$k^h$umar-ə</td>
<td>gumar-ə</td>
<td>gumar-ə</td>
</tr>
<tr>
<td>‘is the amount’</td>
<td>$k^h$umar-n=e</td>
<td>gumar-n=e</td>
<td>gumar-ən=e</td>
</tr>
</tbody>
</table>

- In connected speech, Iranian patterns like Eastern. The following word feeds definite allomorphy

- We again see two segments in Iranian, only one in Western/Eastern

<table>
<thead>
<tr>
<th></th>
<th>Iranian:</th>
<th>Eastern:</th>
<th>Western:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gloss:</td>
<td>man-DEF</td>
<td>woke.up.PST3SG</td>
<td></td>
</tr>
<tr>
<td>Translation:</td>
<td>‘The man woke up.’</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>mår$h$-ən</th>
<th>aɾt$h$nats$h$əv</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mår$h$-ə</td>
<td>aɾt$h$ents$h$əv</td>
</tr>
<tr>
<td></td>
<td>mår$h$-ən</td>
<td>aɾt$h$nats$h$əv</td>
</tr>
<tr>
<td></td>
<td>mår$h$-ə</td>
<td>aɾt$h$ents$h$əv</td>
</tr>
<tr>
<td></td>
<td>mår$h$-ən</td>
<td>aɾt$h$nats$h$əv</td>
</tr>
<tr>
<td></td>
<td>mår$h$-ə</td>
<td>aɾt$h$ents$h$əv</td>
</tr>
<tr>
<td></td>
<td>mår$h$-ən</td>
<td>aɾt$h$nats$h$əv</td>
</tr>
<tr>
<td></td>
<td>mår$h$-ə</td>
<td>aɾt$h$ents$h$əv</td>
</tr>
<tr>
<td></td>
<td>mår$h$-ən</td>
<td>aɾt$h$nats$h$əv</td>
</tr>
<tr>
<td></td>
<td>mår$h$-ə</td>
<td>aɾt$h$ents$h$əv</td>
</tr>
<tr>
<td></td>
<td>mår$h$-ən</td>
<td>aɾt$h$nats$h$əv</td>
</tr>
<tr>
<td></td>
<td>mår$h$-ə</td>
<td>aɾt$h$ents$h$əv</td>
</tr>
</tbody>
</table>
Double docking

- Generalization: between a C and V, the definite suffix has two segments
- This surprisingly works well with our abstract analysis of /-(ə)(n)/
- In Eastern, only one segment is docked in C_V context
- In Iranian, both are docked in order to avoid a coda

<table>
<thead>
<tr>
<th></th>
<th>Western</th>
<th>Eastern</th>
<th>Iranian</th>
</tr>
</thead>
<tbody>
<tr>
<td>V_V</td>
<td>gadu-n=e</td>
<td>katu-n=e</td>
<td>k6tu-n=ŋ</td>
</tr>
<tr>
<td>C_V</td>
<td>kʰumar-n=e</td>
<td>gumar-n=e</td>
<td>guməɾən=ŋ</td>
</tr>
</tbody>
</table>
Double-docking is derivable by careful reranking of NoCoda across dialects

**Eastern**

<table>
<thead>
<tr>
<th>//gu.mar-(ə)(n)=e//</th>
<th>Parse</th>
<th>*C-C</th>
<th>σ</th>
<th>Onset</th>
<th>Dep(skel)</th>
<th>NoCoda</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. gu.mar-(ə)(n)=e</td>
<td><em>!</em></td>
<td></td>
<td>*</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>b. gu.mar.ə.ne</td>
<td></td>
<td></td>
<td></td>
<td>**!</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. gu.mar.ne</td>
<td></td>
<td></td>
<td></td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

**Iranian**

<table>
<thead>
<tr>
<th>//gu.mar-(ə)(n)=d//</th>
<th>Parse</th>
<th>*C-C</th>
<th>σ</th>
<th>Onset</th>
<th>NoCoda</th>
<th>Dep(skel)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. gu.mar-(ə)(n)=d</td>
<td><em>!</em></td>
<td></td>
<td>*</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>b. gu.mar.ə.nə</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>**</td>
<td></td>
</tr>
<tr>
<td>c. gu.mar.nə</td>
<td></td>
<td></td>
<td></td>
<td>*!</td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>
Iranian Floaters

- Given our abstract UR /-(ə)(n)/, only of the two segments gets docked in Western/Eastern
- But in Iranian, both can dock in C_V context
  
<table>
<thead>
<tr>
<th></th>
<th>West/East</th>
<th>Iranian</th>
</tr>
</thead>
<tbody>
<tr>
<td>V_</td>
<td>-n</td>
<td>-n</td>
</tr>
<tr>
<td>C_</td>
<td>-ə</td>
<td>-ə</td>
</tr>
<tr>
<td>C_V</td>
<td>-n</td>
<td>-ən</td>
</tr>
</tbody>
</table>

- For our **Representational** solution, this falls out from careful constraint rerankings over the UR /-(ə)(n)/
- But for a **Procedural** late spell-out trick, we would have to innovate an additional allomorph in the UR: /-ə, -n, -ən/
- This works. But there’s no reason why Iranian why creates an allomorph /-ən/ that’s a concatenation of the other allomorphs
- Iranian could’ve might as well used an allomorph like -ap
Table of Contents

- Introduction
- Typical alternations: possessive suffixes
- Atypical alternation
  - Outwardly-sensitive allomorphy
  - Reduction to abstract representations
- Extending atypicality
  - Phrasal resyllabification in Eastern
  - Double-docking in Iranian
- Discussion
So far, our Representational solution has managed to explain the breadth of dialectal variation

<table>
<thead>
<tr>
<th></th>
<th>Western</th>
<th>Eastern</th>
<th>Iranian</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isolation</td>
<td>V_</td>
<td>-n</td>
<td>-n</td>
</tr>
<tr>
<td></td>
<td>C_</td>
<td>-\emptyset</td>
<td>-\emptyset</td>
</tr>
<tr>
<td>Cliticized</td>
<td>C_ = V</td>
<td>-n</td>
<td>-n</td>
</tr>
<tr>
<td>Connected speech</td>
<td>C_ # V</td>
<td>-\emptyset</td>
<td>-\emptyset</td>
</tr>
</tbody>
</table>

Some dialects dock both segments, some dock only one

Docking is sensitive to phrasal resyllabification in some dialects, but not others

A procedural alternative (late spell-out) would handle the variation too, but it wouldn’t predict it
Inward vs. Outward sensitivity:

<table>
<thead>
<tr>
<th>Western</th>
<th>Eastern</th>
</tr>
</thead>
<tbody>
<tr>
<td>C_ -∅</td>
<td>C_=V -n</td>
</tr>
</tbody>
</table>

- Representation: We need an abstract representation
- Procedure: Just use a late spell-out for just this morpheme

Clitics vs Lexical word?

<table>
<thead>
<tr>
<th>Western</th>
<th>Eastern</th>
</tr>
</thead>
<tbody>
<tr>
<td>C_=V -n</td>
<td>C_ #V -∅</td>
</tr>
</tbody>
</table>

- Representation: This must be due to phrasal resyllabification!
- Procedure: Just make up extra diacritics

Single segment vs two segments?

<table>
<thead>
<tr>
<th>Western</th>
<th>Iranian</th>
</tr>
</thead>
<tbody>
<tr>
<td>C_ -∅</td>
<td>C_=V -n</td>
</tr>
<tr>
<td></td>
<td>C_=V -∅n</td>
</tr>
</tbody>
</table>

- Representation: This must be due to double docking!
- Procedure: Just make up an extra allomorph
Coverage

- Both a representational and procedural approach would cover the same descriptive ground, but...
- Representational strategy is more restrictive because it has fewer tricks to capture dialectal variation
- Procedural approaches allow bona fide cases of outwardly-sensitive allomorphy,
- While a representational approach makes any apparent outward-sensitivity be epiphenomenal from other factors  
  - Diachronic lenition  
  - Diachronic analogy  
  - Formality  
  - Emphatic speech
- Leads to the question: Is outwardly-sensitive allomorphy always epiphenomenal?
**Conclusion**

- **Data**: Looked at typicalities in phonologically-conditioned allomorphy
  - Typical: alternations conditioned inwardly == Armenian possessives
  - Atypical: alternations conditioned outwardly == Armenian definite

- **Analysis**: derive outward-sensitivity from abstract representations without compromising cyclic spell-out

- **Small takeaway**: Armenian definite is just floating segments, without late spell-out, and without true allomorphy

- **Bigger takeaway**: Another case of reducing outwardly-sensitive allomorphy to representations

- **Biggest takeaway**: Careful balancing act between representations and procedures (Anderson, 1985; Scheer, 2011)

- **Unknown takeaway**: Does outwardly-conditioned allomorphy truly ever exist?
  - Mostly no (Ulfsbjorninn, 2020), but sometimes yes (Rolle and Bickmore, pear)
End

- End :)  
- Thanks to:  
  - Organizers + audience  
  - Fellow Armenologists (Tabita Toparlak + Bert Vaux + Nikita Bezrukov)  
  - Informants (Arevik Torosyan + Tatevik Yolyan + Hovik Zadikyan + Nicole Khachikian + Karine Megerdoomian)  
  - Fellow allomorphy folks (Shanti Ulfsbjorninn + Nicholas Rolle)  

Western $f\text{noragal}=em$

Eastern $f\text{norakal}=em$

Iranian $f\text{norakol}=em$

grateful=am
Diachronic origins

- Classical Armenian is earliest attested variety of Armenian, ~4th century
- Modern possessives and definite are reflexes of Classical deixis suffix

<table>
<thead>
<tr>
<th>Classical</th>
<th>Proximal</th>
<th>Medial</th>
<th>Distal</th>
</tr>
</thead>
<tbody>
<tr>
<td>V_</td>
<td>-s</td>
<td>-d</td>
<td>-n</td>
</tr>
<tr>
<td>C_</td>
<td>-əs</td>
<td>-əd</td>
<td>-ən</td>
</tr>
</tbody>
</table>

- Definite suffix’s origin was as simple UR /-n/ that triggered schwa epenthesis

<table>
<thead>
<tr>
<th>Modern</th>
<th>Proximal</th>
<th>Medial</th>
<th>Distal</th>
</tr>
</thead>
<tbody>
<tr>
<td>V_</td>
<td>-s</td>
<td>-tʰ</td>
<td>-n</td>
</tr>
<tr>
<td>C_</td>
<td>-əs</td>
<td>-ətʰ</td>
<td>-ə</td>
</tr>
</tbody>
</table>

- Diachronically, the final nasal weakened while the schwa became lexicalized
  - /-n/ → /-(ə)(n)/
Diachronic analogy

- Diachronic changes in the definite suffixes caused a similar change in the indefinite suffix
- Modern Western indefinite shows same outward-sensitivity as definite suffix

\[ \_ = V \quad mə \quad mən \]

- Diachronically, \( mə/mən \) is a reflex of \( mi \)
- Abstract segment (n) from definite got analogized into indefinite /-mə(n)/
● In Eastern Armenian, the norm is to apply phrasal resyllabification of definite suffix to following word unless there’s a pause.

● Schools teach that the pre-V definite suffix should always syllabify rightwards unless there’s a pause.

● But informal colloquial registers allow optionality and variation

  a. gevork\textsuperscript{h}-n atam-n uni
  b. gevork\textsuperscript{h}-\textepsilon atam-n uni

  Gevork-DEF tooth-DEF has.PRS\textsubscript{1SG}

  ‘Gevork has the tooth.’
Emphatic speech

- Iranian is unique in docking both segments in -(ə)(n)
- But we can sometimes find both segments docked in emphatic speech in Western

\[(3)\] \(\text{ink}^h -n =e\)
\(\text{him} -\text{DEF} =\text{is}\)
‘It is him.’

\[(4)\] \(\text{ink}^h -n/\text{ən} =e\)
\(\text{him} -\text{DEF} =\text{is}\)
‘It is HIM.’


