

# Grammar of Western Armenian

Hossep Dolatian

Michele Sigler

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Michele Sigler

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# Preface





# Acknowledgments

“Our survival is our revenge”

## *Acknowledgments*

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## TODO

- ctrl-f to find th, lv, neg, inf, def to make sure got the right tags
- make sure suppletive roots get aor tag



# 1 Introduction and overview

TODO: stuff in the notes

## 1.0.1 Transcription and representations

For every example in this grammar, we provide at most the following types of representations in the following order. Those with the asterisk \* are present for every example.

### 1. Representations used in this grammar:

- a) **\*Surface Pronunciation:** Every word or sentence is given a broad phonetic transcription in IPA. This transcription encodes noticeable types of allophony, such as voicing assimilation. This form is demarcated with either brackets [...] or nothing.
- b) **Underlying Pronunciation:** When relevant, we provide the underlying pronunciation (underlying form, underlying representation) of words. This pronunciation is in IPA and it undoes allophony and other morpho-phonological alternations from the surface pronunciation. This representation is not based on the orthography or diachrony but based on allophony and on changes in a morpheme's pronunciation across its inflectional paradigm. This form is demarcated with slashes /.../.
- c) **Morphological Gloss:** For sentences and for some words, we provide a morpheme segmentation. In the phonology chapters, we tend to minimize morpheme segmentations if they're not relevant. Sentences get full segmentation. Paradigms have full segmentation.
- d) **\*Translation:** We translate the word or sentence into English. In most but not all cases, the translation of a word can be found in online dictionaries.
- e) **\*Orthographic Representation:** We write the sentence or word based on the traditional orthography of Western Armenian. In rare cases, if a word or sentence is from Eastern Armenian, we use the reformed orthography.

- f) **Transliteration:** When useful, we transliterate Western Armenian examples using our own transliteration scheme. Eastern Armenian data is transcribed with ISO 9985.<sup>1</sup> We generally provide transliterations only when we are discussing the orthography of an example. This form is demarcated with arrows <>.

We illustrate with the following example (1).

- (1)    *menk<sup>h</sup> hos-te'x-e-n*                      *gə-skə's-i-ŋk<sup>h</sup>*  
         /*menk<sup>h</sup> hos-de'x-e-n*                      *g-sk<sup>h</sup>s-i-nk<sup>h</sup>/*  
         we        this-place-ABL-DEF IND-start-TH-1PL  
         ‘We start from here.’  
         Մենք հոստեղէն կը սկսինք:  
         <Menk' hosdeyēn gə sgsink'.>

In some cases, we provide a hypothetical earlier pronunciation or version of a word. We use double slashes for this //...//. We also use double-slashes for intermediate forms of a word, i.e., a form where some but not all phonological rules have applied.

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<sup>1</sup><https://www.translitteration.com/transliteration/en/armenian-eastern-classical/iso-9985/>

## Part I

# Phonology and orthography





## 2 Orthography

This chapter goes over the orthographic system of Western Armenian. We focus on describing the basic elements of Armenian orthography. We do not go in depth in explaining the relationship between orthography and phonology in this chapter. We instead refer readers to specialized sections within different phonology chapters. This is because understanding the linguistic use of various orthographic elements depends on understanding the phonology. More information of Armenian orthography can be found in the references of more specialized sources (Sanjian 1996).

As an overview, Section §2.1 goes over the basic letters of the Armenian alphabet. In Section §2.2, we describe the history of the Armenian script and past spelling reforms.

Section §2.3 goes over punctuation symbols in Western Armenian. Some symbols are placed at the end of phrases and words, while some symbols are ‘infixes’ or inserted inside of a word. These infixes target the stressed or focused syllable in both declaratives and interrogatives (§5.7).

Section §2.4 goes over some a set of mismatches between the orthography and phonology. Although Armenian orthography is quite close to the surface pronunciation of words, there are mismatches and homophony in the voicing of consonants. These are due to diachronic sound changes.

### 2.1 Letters

The Armenian script was invented in around the 5<sup>th</sup> century by saint Mesrop Mashtots, an Armenian clergyman. The script is written left-to-right. The script originally had only 36 letters, but an additional two letters օ <ō>, ֆ <f> were added in the additional ages. The digraph ու <ow> is often treated as an additional symbol because its primary pronunciation is the vowel /u/.

The native name of the Armenian script is in (1). Morphologically, the word ‘alphabet’ is a compound of the first two letters of the script (ա /ɑjp<sup>h</sup>/, բ /p<sup>h</sup>en/) that are connected with the conjunction /u/ ‘and’.

## 2 Orthography

- (1) hajeren-i                      aɟp<sup>h</sup>up<sup>h</sup>en-ə  
 Armenian.language-GEN alphabet-DEF  
 ‘the Armenian alphabet’  
 հայերէնի այբուբենը

Throughout this grammar, we utilize the transliteration scheme in Table 2.1. Outside of this orthography chapter and of other orthography-based sections, we generally skip providing transliterations and just provide the IPA transcription.

Note that the transliteration system that we use in this book is not a standardized transliterations. Most existing transliterations of the Armenian script are based on the pronunciation rules of Classical or Eastern Armenian. Thus these transliteration systems are unsuitable to Western Armenian phonemes. As for those systems which were designed for Western Armenian, many of these systems are difficult to use because either a) they don’t have a 1-to-1 symbol association, or b) they represent affricates with difficult-to-remember symbols such as <č> for չ [tʃ].

Armenian has graphemes or letters for every phonemic consonant and vowel. Vowels show some complications however (Table 2.2). For all but the schwa, a pronounced vowel is always written in the orthography in some manner or another. For the schwa, some instances of a pronounced schwa are written with ղ <ə>, while some are not written at all.

Table 2.2: Vowel-to-letter associations for non-schwas

Vowel	Letter(s)	Example
/a/	ա <a>	ափ <ap’>    [ap <sup>h</sup> ]    ‘palm’
/e/	ե <e>	երգ <erk>    [jerk <sup>h</sup> ]    ‘song’
	է <ē>	էշ <ēʃ>    [eʃ]    ‘donkey’
/o/	ո <o>	ոչ <otʃ’>    [votʃ]    ‘no’
	օ <ō>	օձ <ōts>    [ots]    ‘snake’
/i/	ի <i>	իմ <im>    [im]    ‘my’
/u/	ու <ow>	ուս <ows>    [us]    ‘shoulder’
/ə/	ը /ə/	ըստ <əsd>    [əst]    ‘according to’
	Ø	դրամ <tram>    [təram]    ‘money’

The vast majority of words with a pronounced schwa do not represent the schwa in the orthography. We discuss this asymmetry in Section §3.2.2.2 within the context of the schwa’s phonology. In brief, when a schwa is unwritten, the orthography reflects the origins of the schwa as being epenthetic, a reduced vowel, or a syncopated vowel.

Table 2.1: Letters of Armenian script

Uppercase	Lowercase	Name	Transliteration	Pronunciation
Ա	ա	այբ զյփ <sup>h</sup>	<a>	/ɑ/
Բ	բ	բեն զփ <sup>h</sup> en	<p>	/p <sup>h</sup> /
Գ	գ	գիմ զփ <sup>h</sup> im	<k>	/k <sup>h</sup> /
Դ	դ	դա զփ <sup>h</sup> a	<t>	/t <sup>h</sup> /
Ե	ե	եչ զփ <sup>h</sup> jetʃ <sup>h</sup>	<e>	/e/, /je/
Զ	զ	զա զփ <sup>h</sup> za	<z>	/z/
Է	է	է զփ <sup>h</sup> e	<ē>	/e/
Ը	ը	ըթ զփ <sup>h</sup> ət <sup>h</sup>	<ə>	/ə/
Թ	թ	թո զփ <sup>h</sup> t <sup>h</sup> o	<t'>	/t <sup>h</sup> /
Ճ	ժ	ժէ զփ <sup>h</sup> ze	<z>	/z/
Ի	ի	ինի զփ <sup>h</sup> ini	<i>	/i/
Լ	լ	լին զփ <sup>h</sup> lyn	<l>	/l/
Խ	խ	խէ զփ <sup>h</sup> χe	<x>	/χ/
Ս	ծ	ծա զփ <sup>h</sup> dzɑ	<dz>	/dz/
Կ	կ	կեն զփ <sup>h</sup> gen	<g>	/g/
Հ	հ	հո զփ <sup>h</sup> ho	<h>	/h/
Ձ	ձ	ձա զփ <sup>h</sup> tsɑ	<ts>	/ts <sup>h</sup> /
Ղ	ղ	ղաւսն զփ <sup>h</sup> ʁad	<ɣ>	/ʁ/
Ճ	ճ	ճէ զփ <sup>h</sup> dʒe	<dʒ>	/dʒ/
Մ	մ	մեն զփ <sup>h</sup> men	<m>	/m/
Յ	յ	յի զփ <sup>h</sup> hi	<y>	/j/, /h/, silent
Ն	ն	նու զփ <sup>h</sup> nu	<n>	/n/
Շ	շ	շա զփ <sup>h</sup> ʃɑ	<ʃ>	/ʃ/
Ո	ո	ո զփ <sup>h</sup> vo	<o>	/o/, /vo/
Չ	չ	չա զփ <sup>h</sup> tʃɑ	<tʃ>	/tʃ/
Պ	պ	պէ զփ <sup>h</sup> be	<b>	/b/
Ջ	ջ	ջէ զփ <sup>h</sup> tʃe	<tʃ>	/tʃ/
Ռ	ր	րա զփ <sup>h</sup> ra	<r>	/r/
Ս	ս	սէ զփ <sup>h</sup> se	<s>	/s/
Վ	վ	վեն զփ <sup>h</sup> vev	<v>	/v/
Տ	տ	տին զփ <sup>h</sup> dyn	<d>	/d/
Ր	ր	րէ զփ <sup>h</sup> re	<r>	<r>
Յ	ց	ցո զփ <sup>h</sup> tso	<ts'>	/ts/
Ի	ւ	ին զփ <sup>h</sup> hyn	<w>	/v/
Փ	փ	փին զփ <sup>h</sup> p <sup>h</sup> yr	<p'>	/p <sup>h</sup> /
Ք	ք	քէ զփ <sup>h</sup> k <sup>h</sup> e	<k'>	/k <sup>h</sup> /
Օ	օ	օ զփ <sup>h</sup> o	<ō>	/o/
Ֆ	ֆ	ֆէ զփ <sup>h</sup> fe	<f>	/f/
Ու	ու	ու զփ <sup>h</sup> u	<ow>	/u/, /v/

## 2.2 Writing system and spelling reforms

Western Armenian differs from Eastern Armenian because Western Armenian uses a more conservative spelling system called the Classical Orthography, Traditional Orthography, or Mesropian Orthography. Eastern Armenian instead uses the Reformed Orthography based on Soviet-era spelling reforms. Examples in Table 2.3 illustrate some of the differences. The Reformed system removed silent letters in words. Depending on the word, word-medial /e/ can be written with either grapheme *է* or *ե*; similarly word-medial vowel /o/ can be written with either *ո* or *օ*. The Reformed system removed this unpredictability by uniformity using *ե*, *ո* for word-medial /e, o/.

Table 2.3: Example of differences across spelling systems

Classical spelling	ծառայ	լեր	տէր	մոմ	մօտ
Transliteration	<ḏzaṛay>	<leṛ>	<dēr>	<mom>	<mōm>
Reformed spelling	ծառա	լեր	տեր	մոմ	մոտ
Transliteration	<ḏzaṛa>	<leṛ>	<der>	<mom>	<mom>
Pronunciation	[ḏzara]	[ler]	[der]	[mom]	[mom]

The tradition spelling system included many more types of unpredictability between the orthography and pronunciation. We don't survey these unpredictabilities because they have limited connection to the synchronic phonology of Armenian. But they are useful for learners of the Armenian script. These unpredictabilities are amply documented in various teaching grammars of Armenian (bucket).

The above unpredictability are ultimately due to various sound changes from Classical Armenian to modern Western Armenian. For example, word-final glides in Classical Armenian were lost in polysyllabic words (cite macak?). This loss created the silent letter *յ* as in the word <ḏzaṛay> [ḏzara] 'servant' above. For midvowels, the graphemes *է* <ē> and *ե* <e> were originally pronounced as different midvowels in Classical Armenian (cite macak?). The <ē> form may have been a tense or long version /e:/, while <e> was a plain vowel /e/. Eventually, the two types of midvowels merged into just /e/, thus creating unpredictable spellings in Modern Armenian.

The spelling reform removed essentially all types of unpredictability, surveyed in Dum-Tragut (2009: 12ff). Because Western Armenian is spoken in the Armenian diaspora, Western Armenian publications and literature never adopted the soviet spelling reforms.

digraphs? might as well

## 2.3 Punctuation symbols

Armenian utilizes a small set of punctuation symbols. One set of symbols is placed at the end of phrases and clauses. One set is placed before or between words. And one set is placed inside words.

This chapter provides a simple overview of the types of symbols. The use of these symbols do not significantly differ from Eastern Armenian. For more in-depth discussion of Armenian punctuation and their orthographic rules, see [Dum-Tragut \(2009: ch5\)](#)

For the word-final symbols in Table 2.4, these symbols are used for ending clauses and sentences. Their uses are largely the same in Armenian as they are in other European languages.

Table 2.4: Phrase-final or clause-final punctuation symbols

Symbol	Name	English analog
,	ստորակէտ $\text{\textcircled{a}storaged}$	comma
,	բութ $\text{\textcircled{p}^h\text{ut}^h}$	semicolon
.	միջակէտ $\text{\textcircled{mit}\textcircled{j}aged}$	colon
:	վերջակէտ $\text{\textcircled{vert}\textcircled{j}aged}$	period

Table 2.5 shows the set of punctuation symbols that are placed at the edges of words. These include the Armenian analog of apostrophes and brackets.

Table 2.5: Punctuation that is placed around words or at edges

Symbol	Name	English analog
« »	չակերտ $\text{\textcircled{t}\textcircled{j}agerd}$	brackets
'	ապաթարց $\text{\textcircled{a}bat^h\textcircled{a}rts}$	apostrophe

Finally, Armenian has punctuation symbols that are infixes to be placed inside the word (Table 2.6). These symbols are placed on the stressed vowel of the word which has the strongest prominence in the sentence. In other words, these markers are placed on the syllable that carries nuclear stress or sentential stress. See also Section §5.7 for discussion on stress and orthography.

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Table 2.6: Punctuation symbols that are infixed inside the word

Symbol	Name	English analog
°	պարոյկ baryg	question mark
՝	երկար jergar	exclamation mark
՛	շեշտ jeft	emphasis mark

The stressed vowel is typically the final non-schwa vowel (2a). But the symbol can be placed further inward if the word has irregular non-final stress (2b). The examples below illustrate with the question mark symbol°, which we transliterate as <sup>?</sup>. The marker is placed on the word which carries the nuclear stress of the sentence. We underline this syllable.

- (2) a. marja-n u'ra<sup>°</sup>χ e  
Maria-DEF happy is  
'Is Maria happy?'  
Orthography: Մարիան ուրախ է:  
Transliteration: <Marian owra<sup>?</sup>x ē>
- b. 'vork<sup>h</sup>an g-uz-e-s  
how.much IND-want-TH-2SG  
'How much do you want?'  
Orthography: Ո՞րքան կ'ուզես:  
Transliteration: <O<sup>?</sup>rk'an g'owzes>

idk if its worth going through examples of each marker

## 2.4 Orthography-phonology mismatches

Armenian orthography does not exactly match the surface pronunciations of words, but it is fairly close. As said in Section §2.2, the traditional spelling system creates various types of homophony and unpredictability. This section overviews a significant areas of mismatch between orthography and pronunciation. Some of these mismatches are only present in Eastern Armenian, while some are present in both.

Unless otherwise specified, the Eastern examples are from English Wiktionary. The Wiktionary examples are heavily moderated and are reliable for Eastern Armenian. For transliterations, we adopt ISO 9985 to transliterate the words for Eastern Armenian,<sup>1</sup> while our own transliteration for Western Armenian.

<sup>1</sup><https://www.translitteration.com/transliteration/en/armenian-eastern-classical/iso-9985/>

### 2.4.1 Homophony in voiceless letters

In Western Armenian, stops and affricates have a 2-way laryngeal contrast. Stops and affricates are phonologically either voiced or voiceless.<sup>2</sup> However the orthography displays a 3-way contrast between the graphemes for stops and affricates. Each voiced sound has one corresponding voiced grapheme, but each voiceless sound has two homophones letters. Table 2.7 illustrates for all stops and affricates.

Table 2.7: Homophonous letters for stops and affricates

Letter	Trans.	Pron.	Example		
բ	<p>	/p <sup>h</sup> /	բառ	<paɾ>	[p <sup>h</sup> ɑɾ] ‘word’
փ	<p’>	/p <sup>h</sup> /	փառք	<p’ɑɾk’>	[p <sup>h</sup> ɑɾk <sup>h</sup> ] ‘glory’
պ	<b>	/b/	պար	<baɾ>	[baɾ] ‘dance’
դ	<t>	/t <sup>h</sup> /	դեր	<teɾ>	[t <sup>h</sup> eɾ] ‘role’
թ	<t’>	/t <sup>h</sup> /	թել	<t’ew>	[t <sup>h</sup> ev] ‘wing’
ւ	<d>	/d/	ւեղ	<deɣ>	[deɣ] ‘place’
զ	<k>	/k <sup>h</sup> /	զամ	<kaɱ>	[k <sup>h</sup> am] ‘nail’
ք	<k’>	/k <sup>h</sup> /	քար	<k’ɑɾ>	[k <sup>h</sup> ɑɾ] ‘rock’
կ	<g>	/g/	կար	<gaɾ>	[gaɾ] ‘string’
ծ	<ts>	/ts/	ծագ	<tsak>	[tsak <sup>h</sup> ] ‘cub’
ց	<ts’>	/ts/	ցաւ	<ts’aw>	[tsav] ‘pain’
ծ	<dʒ>	/dʒ/	ծակ	<dʒag>	[dʒag] ‘hole’
ջ	<tʃ>	/tʃ/	ջուր	<tʃowɾ>	[tʃuɾ] ‘water’
չ	<tʃ’>	/tʃ/	չու	<tʃ’ow>	[tʃu] ‘flight’
ճ	<dʒ>	/dʒ/	ճուլ	<dʒowd>	[dʒud] ‘chick’

For a given voiceless sound like [p<sup>h</sup>], there are two homophonous graphemes բ, փ <p, p’>. For a speaker of Western Armenian, the choice of grapheme is unpredictable and has no phonological correlation. The homophony is a cause for common spelling errors for Western Armenian.

The voiceless homophony is because in Classical Armenian, the different graphemes did reflect different voicing quality (Table 2.8). In modern Western Armenian stops/affricates show a two-way contrast between voiced and voiceless. But Classical stops/affricates had a 3-way contrast between voiced, voiceless unaspirated,

<sup>2</sup>Acoustically, the actual correlates of voice vary by geographic region. This is overviewed in Section §3.1.1.





Table 2.9: Orthographic mismatches in voicing of consonant clusters

սպասել	<sbasel>	[əspasɛl]	‘to wait’
հաստ	<hasd>	[hast]	‘thick’
սկիզբ	<sgizb>	[əskisp]	‘beginning’
զբօսանք	<zpōsank’>	[əsposank <sup>h</sup> ]	‘recess’
աղբ	<ayp>	[ɑxp]	‘trash’
խեղդել	<xeytel>	[χexɬel]	‘to strangle’
յաղթել	<yayt’el>	[hɑxɬel]	‘to win’
ազգ	<azk>	[ask]	‘nation’
աղքատ	<ayk’ad>	[ɑxkad]	‘poor’

For the clusters above, there is no synchronic evidence that the cluster is composed of consonants with different voicing. That is, for a word like ազգ <azk> [ask] ‘nation’, there is no synchronic evidence that the fricative [s] is derived from an underlying /z/. In all the above words, the cluster is part of a single morpheme, and the consonant never alternates in voicing. That is, for a word like [ask], the fricative is never pronounced as [z] in any morphologically-related word.

Within Armenian philology, there is a lot of work in cataloging words with such mismatches between the spelling and pronunciation, mostly for Eastern Armenian (Աճառյան 1971a: 242-4; Minassian 1980: 29; Սուքիասյան 2004: 62,74; Ավետիսյան 2007: 21; Ավետիսյան 2011: 30). See Հովհաննիսյան (2014: 59) and Ղարազյուլյան (1974: 185) for a summary and systematic catalog. Teaching grammars likewise provide pedagogical tips on how to spell these clusters (Եզեկյան 2007: 75; Սևակ 2009: 92). But synchronically though, these clusters are just residues of sound changes from Classical to modern Armenian. They do not reflect modern Western morphology or phonology.

For example, for ազգ <azk> [ask], the orthography reflects the fact this word is a reflex of Classical [azg] where the cluster was voiced. The orthography matches the classical pronunciation. Eventual sound changes caused the grapheme գ /k/ to switch from being a voiced segment /g/ in Classical to a voiceless /k<sup>h</sup>/ in Western. Once this change occurred, adjacent fricatives had to assimilate in voicing: CA [azg] → [ask], not [\*azk].

### 2.4.3 Post-rhotic devoicing

In Eastern Armenian, there are words which are orthographically written with a final voiced stops and affricates but which are pronounced with a voiceless

## 2 Orthography

aspirated form (Table 2.10). This orthography mismatch is especially common after the rhotic /r/.

**cite**

Table 2.10: Eastern Armenian words with orthography-phonology mismatch for voicing after rhotics

Spelling	Transliteration		Pronunciation		Meaning
	EA	WA	EA	WA	
նւրբ	<nowrb>	<nowrp>	[ˈnurpʰ]	[ˈnurpʰ]	‘gentle’
բարդ	<bard>	<part>	[ˈbartʰ]	[ˈpʰartʰ]	‘complex’
երգ	<erg>	<erk>	[ˈjerkʰ]	[ˈjerkʰ]	‘song’
բարձ	<barj>	<parts>	[ˈbartsʰ]	[ˈpʰartsʰ]	‘pillow’
վերջ	<verj>	<vertʃ>	[ˈvertʃʰ]	[ˈvertʃʰ]	‘end’

Because of how frequent this mismatch some, many philologists and phonologists have argued that Eastern Armenian has an allophonic rule of changing devoicing final voiced stops and affricates after rhotics.

But this rule is not true allophony in Eastern Armenian (Table 2.11). One can find words where devoicing does not apply. There are likewise no cases of this rule applying in derived environments. The most likely scenario is that this orthography-phonology mismatch in Eastern Armenian is just a diachronic change and not a synchronically active rule.

Table 2.11: Eastern Armenian words where final voiced stops or affricates surface after rhotics

Spelling	Transliteration		Pronunciation		Meaning
	EA	WA	EA	WA	
բորբ	<borb>	<porp>	[ˈborb]	[ˈborpʰ]	‘bright’
թակարդ	<t’akard>	<t’agart>	[tʰaˈkard]	[tʰaˈgartʰ]	‘trap’
գորգ	<gorg>	<kork>	[ˈgorg]	[ˈkʰorkʰ]	‘carpet’
մերձ	<merj>	<merts>	[ˈmerd͡ʒ]	[ˈmerʰts]	‘near’
կամուրջ	<kamowrj>	<gamowrtʃ>	[kaˈmurd͡ʒ]	[gaˈmurʰtʃ]	‘bridge’

It is possible that this this rule of devoicing stops/affricates after /r/ is a diachronic sound change that is in progress in Eastern Armenian (Table 2.12) (Ասատրյան 1976, Ավետիսյան 2005). For example, Vahagn Petrosyan informs us that some words are prescriptively pronounced with a final voiced stop, but this voiced sound is often colloquially devoiced.

## 2.4 Orthography-phonology mismatches

Table 2.12: Eastern Armenian words where final voiced stops or affricates are variably devoiced after rhotics

Spelling	Transliteration		Pronunciation			Meaning
	EA	WA	Std. EA	Coll. EA	WA	
կախարդ	<kayard>	<gayart>	[ka'ʁard]	[ka'ʁartʰ]	[ga'ʁartʰ]	'witch'
լուրջ	<k'owrj>	<k'owrtʃ>	[kʰurdʒ]	[kʰurtʃʰ]	[kʰlurtʃ]	'rag'

read the above EA references again for data for other stuff

No such issue arises in Western Armenian (Table 2.13). Word-final voiced stops and affricates exist after rhotics.

Table 2.13: No post-rhotic devoicing in Western Armenian

Spelling	Transliteration (WA)	Pronunciation (WA)	Meaning
կերպ	<gerb>	[ˈgerb]	'form'
աւարտ	<award>	[aˈvard]	'end'
մերկ	<merg>	[ˈmerg]	'naked'
գործ	<kordz>	[kʰordz]	'work'
սուրճ	<sowrdʒ>	[ˈsurdʒ]	'coffee'

### 2.4.4 Deletion of <h> after rhotics

In modern Armenian, the orthography has a letter h for the sound /h/. But this sound is deleted in some words. This deletion is obligatory and likely due to a diachronic rule.

There are some roots which are orthographically spelled with a rhotic + <h>. Some of these roots pronounce the <h>, and some don't. Table 2.14 lists such roots where the <h> is not pronounced. For these roots, this <h> was likely pronounced in earlier stages of the language. The sound /h/ is absent both when the word is said in isolation and when suffixes are added.

## 2 Orthography

Table 2.14: Words where the letter <h> is not pronounced after rhotics

Root	աշխարհ	<afxarh>	af'xar	'world'
→	աշխարհային	<afxarhayin>	af'xar-a'jin	'worldly'
→	աշխարհի	<afxarhayin>	af'xar-i	'world-GEN'
Root	խոնարհ	<xonarh>	xo'nar	'humble'
→	խոնարհում	<xonarhowm>	xona'r-um	'conjugation'
→	խոնարհիչ	<xonarhē>	xona'r-e	'humble-ABL'
Root	ճանապարհ	<džanabarh>	džana'bar	'road'
→	ճանապարհորդ	<džanabarhort>	džanaba'r-ort <sup>h</sup>	'traveller'
→	ճանապարհներ	<džanabarhner>	džanabar-ner	'road-PL'
Root	շնորհ	<fnorh>	fə'nor	'grace'
→	շնորհակալ	<fnorhowm>	fənor-a'gal	'thankful'
→	շնորհով	<fnorhov>	fəno'r-ov	'grace-INS'
Root	խորհուրդ	<xorhowrt>	xo'rurt <sup>h</sup>	'advice'
→	խորհրդատու	<xorhrtawor>	xorərt <sup>h</sup> -a'vor	'wise'
→	խորհուրդներ	<xorhowrtner>	xorurt <sup>h</sup> -ner	'advice-pl'

For the above words, the absence of a pronounced /h/ is not a phonological rule but an orthography-phonology mismatch. Such a rule of deleting an /h/ after a rhotic must have been a diachronic rule, and it is not a synchronic rule. Evidence for this is that there are roots where the <rh> sequence is pronounced as /rh/ (Table 2.15).

Table 2.15: Words where the letter <h> is pronounced after rhotics

ժպիրհ	<žbirh>	žə'birh	'insolent'
նիրհ	<nirh>	'nirh	'light slumber'
արհեստ	<arhesd>	ar'hest	'handicraft'
արհամարհ	<arhamarh>	arha'mar	'despicable'
զարհուր	<zarhur>	zar'hur	'terrifying'

There is likewise the bound root օրհն <ōrhñ> where the <h> is typically pronounced as a /t<sup>h</sup>/ in all its derivatives (Table 2.16).

Table 2.16: Words where the letter <h> is pronounced as [t<sup>h</sup>]

օրհնել	<ōrhñel>	ort <sup>h</sup> n-e-l	'to bless'	√-TH-INF
օրհնեալ	<ōrhñeal>	ort <sup>h</sup> n-jal	'blessed'	√-ADJZ
օրհնութիւն	<ōrhñut'iwn>	ort <sup>h</sup> n-u't <sup>h</sup> jyn	'blessing'	√-NMLZ

## *2.4 Orthography-phonology mismatches*

In sum, the above data is just an orthography-phonology mismatch, and is not a synchronic phonological rule of /h/ deletion.



### 3 Segmental phonology

This chapter goes over the segmental phonology of Western Armenian (henceforth Armenian or WA). We focus on providing the basic phoneme inventory of Armenian.

We document the set of attested allophonic processes in Armenian. For consonants, these processes involve changes in the laryngeal or voicing quality of obstruents, i.e., voicing assimilation. For vowels, there is little known about any allophonic alternations. There are some reports of vowel rounding for the underlying sequence /ju/. We briefly list segmental processes that have been reported in previous grammars but which seem to be either unsystematic or obsolete in modern speech. . This section focuses more so on the phonology of segments, and not on their phonetics or acoustics. For an overview of segmental phonetics, see [Seyfarth et al. \(review\)](#)

For ease of reference, Figures 3.1 and 3.2 provide the consonant inventory and vowel inventory.

	Bilabial	Labio -dental	Dental	Alveolar	Post- alveolar	Palatal	Velar	Uvular	Glottal
Plosive	p <sup>h</sup> b		t <sup>h</sup> d				k <sup>h</sup> g		(ʔ)
Affricate			ts dz		tʃ dʒ				
Nasal	m			n			(ŋ)		
Tap									
Fricative		f v		s z	ʃ ʒ			χ ʁ	h
Rhotic				r					
Lateral				l					
Glide	. (w)					j			

Figure 3.1: Consonant inventory

The consonant inventory includes [ŋ] in parenthesis. This sound is not a contrastive phoneme in Armenian; it is derived from /n/ when /n/ precedes a velar stop (§3.4). The glide [w] is in parenthesis because it is restricted to non-nativized loanwords (§3.1.7). The glottal stop [ʔ] is epenthesized in vowel hiatus in some morphological constructions (§4.7).

For vowels, we include the sound /y/ even though this sound is often interchangeable with the sound sequence /uj/. We include the schwa /ə/. For the mid

### 3 Segmental phonology

vowels, many past phonological studies of Armenian treated these vowels as lax /ɛ, ɔ/. We treat them as tense /e, o/. We discuss this difference in Section §3.2.1. We include /œ/ as a marginal phoneme.

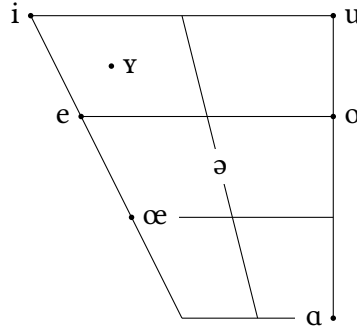


Figure 3.2: Vowel inventory

We go over each type of segment below.

add frequency of letters

## 3.1 Consonants

### 3.1.1 Stops

Western Armenian has a 2-way distinction for stops: phonologically voiced vs. phonologically voiceless (Table 3.1). Stops can have one of 3 places of articulation: bilabial, coronal (dental), and velar. Near-minimal pairs are below for word-initial, intervocalic, and word-final stops.

In terms of articulation, the coronal series /t<sup>h</sup>, d/ is usually pronounced with tongue-tip touching the back of the teeth, i.e. a dental articulation. Dental articulation is previously reported for both Western Armenian and Eastern Armenian CITEpadd stuff. A more narrow phonetic transcription would transcribe these consonants as [t<sup>h</sup>, d]. We opt for simpler [t<sup>h</sup>, d].

In terms of acoustics, the distinction between the phonologically voiced and voiceless stops varies by geographic region and by influence of other languages. Depending on the region where Western Armenian is spoken, the phonological voiced-voiceless distinction /D-T<sup>h</sup>/ is acoustically manifested by either prevoicing vs. unaspiration [D-T], unaspiration vs. aspiration [T-T<sup>h</sup>], or prevoicing vs. aspiration [D-T<sup>h</sup>]. Table 3.2 illustrates.



Table 3.1: Near-minimal pairs for stops

	Initial	Intervocalic	Final
/p <sup>h</sup> /	'p <sup>h</sup> ats 'open' բաց	ʃa'p <sup>h</sup> at <sup>h</sup> 'week' շաբաթ	ʃʁap <sup>h</sup> 'size' չափ
	p <sup>h</sup> a'ri 'kind' բարի	p <sup>h</sup> ap <sup>h</sup> a'k <sup>h</sup> el 'to hope' փափաքել	a'rap <sup>h</sup> 'Arab' արաբ
/b/	'baʁ 'cold' պաղ	ba'ba 'dad' պապա	'gab 'link' կապ
	baʃtel 'to worship' պաշտել	aba'gi 'glass' ապակի	ba'rab 'empty' պարապ
/t <sup>h</sup> /	't <sup>h</sup> as 'lesson' դաս	t <sup>h</sup> a't <sup>h</sup> ar 'pause' դադար	'p <sup>h</sup> at <sup>h</sup> 'duck' բադ
	t <sup>h</sup> a'del 'to judge' դատել	at <sup>h</sup> a'mant <sup>h</sup> 'diamond' ադամանդ	ar'dzat <sup>h</sup> 'silver' արծաթ
/d/	'daʁ 'letter' տառ	ga'dag 'joke' կատակ	'mad 'finger' մատ
	da'ri 'year' տարի	bada'ni 'teenager' պատանի	a'zad 'free' ազատ
/k <sup>h</sup> /	'k <sup>h</sup> am 'nail' գամ	ʃa'k <sup>h</sup> ar 'sugar' շաքար	't <sup>h</sup> ak <sup>h</sup> 'crown' թագ
	k <sup>h</sup> a'vat <sup>h</sup> 'cup' գավաթ	ak <sup>h</sup> a'rag 'farm' ագարակ	a'rak <sup>h</sup> 'fast' արագ
/g/	'gat <sup>h</sup> 'milk' կաթ	ʃa'gat <sup>h</sup> 'forehead' ճակատ	'p <sup>h</sup> ag 'closed' փակ
	ga'rab 'swan' կարապ	daga'vin 'still' տակալին	a'rag 'proverb' առակ

Table 3.2: Acoustic variation of stops

Phonological value	[D-T <sup>h</sup> ]	[D-T]	[T-T <sup>h</sup> ]
Voiced /b/	[b]	[b]	[p]
Voiceless /p <sup>h</sup> /	[p <sup>h</sup> ]	[p]	[p <sup>h</sup> ]
Voiced /d/	[d]	[d]	[t]
Voiceless /t <sup>h</sup> /	[t <sup>h</sup> ]	[t]	[t <sup>h</sup> ]
Voiced /g/	[g]	[g]	[k]
Voiceless /k <sup>h</sup> /	[k <sup>h</sup> ]	[k]	[k <sup>h</sup> ]
Region	Turkey	Lebanon	USA

### 3 Segmental phonology

The earliest work on Western Armenian was done by Hrachia Adjarian in the late 19<sup>th</sup> century (Adjarian 1899). He collected acoustic data on speakers of Armenian across the Ottoman Empire. His work likewise one of the earliest work to utilize what is now called Voice Onset Time (VOT) (Braun 2013). His speakers had a [D-T<sup>h</sup>] distinction, whereby phonologically voiced stops were prevoiced while phonologically voiceless stops were voiceless aspirated CITEpcite adjarian and double check.

Because of Adjarian's foundational work, nearly all subsequent linguistic discussions on Western Armenian treat the language as having a [D-T<sup>h</sup>] distinction. But more recent work has shown the actual acoustic value of stops is subject to extensive geographic variation. This variation is based on the dominant language of the community in which Western Armenian is spoken.

For example, for speakers of Western Armenian in Istanbul, these speakers have a [D-T<sup>h</sup>] distinction, just as previously reported by Adjarian over a century ago. This VOT distinction is likewise found for Turkish, the dominant language of the Istanbul CITEpturkish. But for speakers in Lebanon, these people have a [D-T] distinction where the phonologically voiceless stop is unaspirated (Kelly & Keshishian 2019). This distinction matches that of Lebanese Arabic. As for speakers in the US, they have a [T-T<sup>h</sup>] distinction where the phonologically voiced stops are phonetically voiceless unaspirated, while the phonologically voiceless stops are phonetically voiceless aspirated (Kelly & Keshishian 2021). This matches the situation for North American English. Similar geographic effects are documented for Armenian communities in Canada (Tahtadjian 2021).

For consistency, all phonologically voiced and voiceless stops in this grammar are transcribed with the /D-T<sup>h</sup>/ distinction even though this contrast phonetically varies by speaker. For example for HD, he lived in Lebanon up until 2014 at the age of 21, so his voicing system was likely a [D-T] system. But since 2014, he has been in an English-dominant environment for the US so his voicing system is [T-T<sup>h</sup>] with some occasional prevoicing, as described in Seyfarth et al. (review).

It is an open question how the voicing distinction is acoustically manifested in other geographic areas where Western Armenian is spoken, including France, Armenia, Syria, Latin America, and elsewhere. It is likely that their voicing system would match with that of the dominant language in their society.

#### 3.1.2 Affricates

Western Armenian has affricates in two places of articulation: dental /tʰs<sup>h</sup>, dʒ/ and post-alveolar /tʃ<sup>h</sup>, dʒ/. We provide minimal pairs in Table 3.3.

Table 3.3: Near-minimal pairs for affricates

	Initial		Intervocalic		Final	
/ts <sup>h</sup> /	ts <sup>h</sup> ɑχ	‘left’ ծախ	k <sup>h</sup> ɑ ts <sup>h</sup> ɑχ	‘vinegar’ քացախ	t <sup>h</sup> ats <sup>h</sup>	‘wet’ թաց
	ts <sup>h</sup> ɑ'mak <sup>h</sup>	‘continent’ ցամաք	p <sup>h</sup> ats <sup>h</sup> ɑ'ga	‘absent’ բացակայ	ga'mats <sup>h</sup>	‘slow’ կամաց
	/dz/	'dzɑp <sup>h</sup>	‘clap’ ծափ	ɑ'dzants <sup>h</sup>	‘suffix’ ածանց	ts <sup>h</sup> adz
/tʃ <sup>h</sup> /	dza'not <sup>h</sup>	‘familiar’ ծանօթ	adza'gan	‘adjective’ ածական	ɑ'radz	‘proverb’ առած
	tʃ <sup>h</sup> ɑr	‘bad’ չար	ha'tʃ <sup>h</sup> adz	‘barked’ հաչած	ɑ'tʃ <sup>h</sup>	‘right’ աջ
	tʃ <sup>h</sup> ɑ'mitʃ <sup>h</sup>	‘raisin’ չամիչ	ɑ'tʃ <sup>h</sup> ɑ'gits <sup>h</sup>	‘assistant’ աջակից	ga'gatʃ <sup>h</sup>	‘tulip’ կակաչ
/dʒ/	dʒɑf	‘food’ ճաշ	da'dʒɑr	‘temple’ տաճար	ha'dʒ	‘satisfied’ հաճ
	dʒɑm <sup>h</sup> p <sup>h</sup> ɑ	‘road’ ճամբայ	ha'dʒɑ'χel	‘to frequent’ յաճախել	ɑn'ha'dʒ	‘unsatisfied’ անհաճ

In terms of articulation, the series /ts<sup>h</sup>, dz/ is usually reported to have dental contact. But alveolar contact is reported for some speakers. CITEpcite

As with the stops, there is widespread geographic variation for the acoustics of affricates. This is summarized in Table 3.4 .

Table 3.4: Acoustic variation of affricates

Phonological value		[DS-TS <sup>h</sup> ]	[DS-TS]
Voiced	/dz/	[dʒ]	[dz]
Voiceless	/ts <sup>h</sup> /	[ts <sup>h</sup> ]	[ts]
Voiced	/dʒ/	[dʒ]	[dʒ]
Voiceless	/tʃ <sup>h</sup> /	[tʃ <sup>h</sup> ]	[tʃ]
Region		Turkey	Lebanon & USA

Traditional reports from Adjarian treat the distinction between the phonologically voiced and voiceless affricates as being between prevoicing vs. voiceless aspirated. For communities in Lebanon and the US, more recent acoustic studies find that the distinction is between prevoiced vs. voiceless unaspirated. As with the stops, the variation is due to language contact. Turkish has aspirated affricates, while Lebanese Arabic and North American English do not. CITEpcite, section 1.3.1 of this paper <https://scottseyfarth.com/docs/SeyfarthGarellek2020.pdf>–

### 3 Segmental phonology

An open question is whether there are subdialects of Western Armenian which acoustically mark the distinction in terms of voiceless unaspirated vs. voiceless aspirated. We expect to find such a distinction for speakers who live in a society where the dominant language has such a distinction.

For accuracy, we transcribe all voiceless affricates in this grammar as unaspirated because our main speech samples come from HD's Lebanese dialect.

#### 3.1.3 Fricatives

Western Armenian has the following set of fricatives: /s, z, ʃ, ʒ, χ, ʁ, h/. Each voiceless fricative has a voiced counterpart, except for /h/. Near-minimal pairs are in Table 3.5.

Note that the fricatives are attested in all prosodic positions, but some fricatives are less common. The fricative /ʁ/ is rarely found word-initially. The fricative /f/ is rare throughout Armenian. Most occurrences of /f/ come from loanwords that entered Armenian after the Middle Ages. For example, two out of three words with /f/ in Table 3.5 are loanwords: [ˈfilm] from 'film', and [ʁɑˈfq] from Turkish "kafa".<sup>1</sup>

In term of articulation, there is some divergence on the place of articulation for the series /s, z/. Some grammars report a dental articulation and some alveolar. For some individuals that we've asked, some report that the tongue touches the upper teeth, while some report that the tongue touches the lower teeth.

For /χ, ʁ/, the voiced fricative has a typically uvular articulation. But the voiceless fricative can vary between velar and uvular. We suspect that the fricatives /χ, ʁ/ have free variation between velar and uvular place. Part of our suspicion is the fact that the native authors of this grammar cannot easily hear the difference between velar vs. uvular fricatives.

For the fricative [v], some argue that this sound is always a surface pre-vocalic allophone of /u/, and that /v/ is not phonemic (Vaux 1998: 13). Evidence for this is that /u/ is sometimes replaced by [v] before vowels, as a type of vowel hiatus repair discussed in Section §4.7. We treat /v/ as a separate phoneme though. This is because of the following reasons:

1. Our native intuitions treat /v/ as a phoneme.
2. There is a dedicated grapheme for /v/ վ that is used in the Reformed orthography.
3. There are words where [v] is used even though there's no evidence that this [v] is synchronically related to an [u] sound such as in the examples

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<sup>1</sup><https://en.wiktionary.org/wiki/kafa#Turkish>

Table 3.5: Near-minimal pairs for fricatives

	Initial		Intervocalic		Final	
/f/	'film	'film'	ɤa'fa	'head'	'uf	interjection
		ֆիլմ		դաֆա		ուֆ
/v/	'vart <sup>h</sup>	'rose'	a'vak <sup>h</sup>	'senior'	'lav	'good'
		վարդ		աւագ		լաւ
	va'zel	'to run'	ava'zan	'pool'	ak <sup>h</sup> 'rav	'crow'
		վազել		աւագան		ագռաւ
/s/	'sar	'ice'	ha'sag	'height'	'mas	'part'
		սառ		հասակ		մաս
	sa'hun	'smooth'	t <sup>h</sup> asa'gan	'classical'	və'nas	'damage'
		սահուն		դասական		վնաս
/z/	'zad	'separate'	k <sup>h</sup> a'zan	'beast'	'maz	'hair'
		զատ		զազան		մազ
	za'dig	'Easter'	ɤaza'roz	masc. name	a'vaz	'sand'
		Ջատիկ		Ղազարոս		աւագ
/ʃ/	'ʃah	'gain'	dʒa'ʃag	'taste'	'dʒaʃ	'food'
		շահ		ճաշակ		ճաշ
	ʃa'big	'shirt'	aʃa'gerd	'student'	la'vaʃ	'lavash'
		շապիկ		աշակերտ		լաւաշ
/ʒ/	'ʒam	'time'	p <sup>h</sup> a'ʒag	'cup'	'uʒ	'strength'
		Ժամ		բաժակ		ուժ
	ʒa'raŋk <sup>h</sup>	'heir'	t <sup>h</sup> aʒa'nil	'to tire'	ba'diʒ	'punishment'
		Ժառանգ		տաժանիլ		պատիժ
/χ/	'χaɤ	'game'	dʒa'χadʒ	'sold'	'tsaχ	'left'
		խաղ		ծախած		ձախ
	χa'p <sup>h</sup> el	'to trick'	naχa'k <sup>h</sup> ah	'president'	u'raχ	'happy'
		խաբել		նախագահ		ուրախ
/ɤ/	'ɤeg	'helm'	a'ɤant <sup>h</sup>	'sect'	'aɤ	'salt'
		դել		աղանդ		աղ
	ɤa'zar	masc. name	aɤav'ni	'pigeon'	χa'ɤaɤ	'peaceful'
		Ղազար		աղաւնի		խաղաղ
/h/	'haz	'cough'	ba'hag	'guard'	'k <sup>h</sup> ah	'throne'
		հազ		պահակ		գահ
	ha'zar	'thousand'	aħa'k <sup>h</sup> in	'numerous'	sə'raħ	'hall'
		հազար		ահագին		սրահ

### 3 Segmental phonology

in Table 3.5 like [vazel] ‘to run’. If we treat [v] as non-phonemic, then we would have to argue that this word is derived from an underlying /uazel/ but there’s no evidence for this underlying /u/.

4. There are words which show schwa epenthesis breaking up an orthographic <vC> cluster, such as [vənas] ‘harm’ վնաս <vnas>. If we treat [v] as not phonemic, then we would have to argue that such words are either derived from /unas/ with un-motivated /u/→[v] change, or derived from /uənas/ where the otherwise epenthetic schwa is causing the /u/ to change to [v]. (cite vux)

Thus, although there is a synchronic rule of /u/ becoming [v] before vowels, there is evidence that [v] is also a separate phoneme.

#### 3.1.4 Nasals

Western Armenian has nasals /m, n/. Near-minimal pairs are in Table 3.6.

Table 3.6: Near-minimal pairs for nasals

	Initial		Intervocalic		Final	
/n/	'mah	'death' մահ	a'man	'vessel' աման	'ham	'taste' համ
	'madzun	'yogurt' մածուն	ama'nor	'New Year' ամանոր	an't'am	'member' անդամ
/m/	'nav	'ship' նավ	t <sup>h</sup> a'nag	'knife' դանակ	t <sup>h</sup> an	'ayran' թան
	na'mag	'letter' նամակ	ana'bad	'desert' անապատ	if'χan	'prince' իշխան

In terms of articulation, /m/ is bilabial. The nasal /n/ typically has dental articulation [n̪], but we transcribe this segment as [n] for ease. There a velar nasal [ŋ]. But this sound is not a phoneme. It is an allophone of /n/ before velar stops. This is a discussed in Section §3.4.

#### 3.1.5 Rhotic

Western Armenian has only one rhotic phoneme /r/ (Table 3.7).

Table 3.7: Near-minimal pairs for rhotic /r/

	Initial	Intervocalic	Final
/r/	ro'be 'second' րոպէ	t <sup>h</sup> a'rag 'shelf' դարակ	t <sup>h</sup> ar 'century' դար
	ra'fi masc. name Րաֆֆի	ara'radz 'creature' արարած	t <sup>h</sup> əz'var 'difficult' դժուար

The rhotic /r/ is alveolar. Acoustically, the rhotic is often spirantized (Toparlak 2019). It is relatively rare to find rhotic-initial words.

Note that Eastern Armenian has a phonemic flap-trill distinction: /r, r/. Each Eastern phoneme is presented by two graphemes ր, ռ <ր, ռ>. The same trill-flap distinction is reported for Classical Armenian CITEpmacak. For Western Armenian, the two types of rhotics have merged into a single flap /r/, causing the letters ր, ռ to be homophonous. This is illustrated in Table 3.8.

Table 3.8: Trill-flap merger in Western (WA) but not Eastern (EA)

	Initial		Intervocalic		Final	
ր	Րաֆֆի		ծարաւ	հարազատ	քար	տկար
<r>	<raffi>		<ḏzaraw>	<harazad>	<k'ar>	<dgar>
EA /r/	ra(f)'fi		ṯsa'raʋ	hara'zat	k <sup>h</sup> ar	tə'kar
WA /r/	ra'fi		ḏza'raʋ	hara'zad	k <sup>h</sup> ar	də'gar
	masc. name		'thirsty'	'kindred'	'rock'	'weak'
ռ	ռուս	ռազմիկ	առաջ	առարկայ	ծառ	օճառ
<ɹ>	<rus>	<razmig>	<aɹat̪>	<aɹargay>	<ḏzaɹ>	<oḏzaɹ>
EA /r/	'rus	raz'mik	a'rat̪	araɹ'ka	ṯsaɹ	o'ṯsaɹ
WA /r/	'rus	raz'mik	a'rat̪	araɹ'ga	ḏzaɹ	o'ḏzaɹ
	'Russian'	'warrior'	'before'	'object'	'tree'	'soap'

Historically, earlier stages of Western Armenian did have a phonemic flap-trill distinction adjarian. This is reported in early textbooks of Western Armenian cite.

For modern communities, there is no longer an active flap-trill distinction. Some textbooks acknowledge this and state that the letters ր ռ <ր ռ> are homophonous. cholak

But many schools and textbooks artificially teach a trill. They often qualify the distinction by saying that the pronunciation difference between the letters is “blurry”. These textbooks teach a distinction for two reasons. One reason is

diachronic conservatism – they want to teach what was spoken a century or more ago. The other reason is to teach students ways to figure out the right spelling of words. For example, a teacher may exaggerate the pronunciation of a word that has the letter *n* <*r*> by excessively trilling the letter. But neither students, teachers, nor communities actually use a trill phoneme in real speech. Many teachers in HD’s experience don’t even bother to speak artificially and acknowledge to students that the letters *n* <*r*, *r*> are homophonous.

There is no active trill-flap distinction for communities in the US (Samuel Chakmadjian), Canada (Talia Tahtadjian), Turkey (Tabita Toparlak), Lebanon (HD, Avedis Samuelian), or Syria (HS, Setrag Hovsepian).

To illustrate this complex set of affairs, consider the Armenian community of Canada. Talia Tahtadjian informs us some older speakers have a trill-flap distinction and schools try to teach this distinction. However, students don’t truly acquire this distinction because there is little significant difference in their articulation of the letter *n* <*r*> and *n* <*r*>.

Note that there are reports that some Western Armenian communities have an allophonic rule of changing /*r*/ to [r] before nasals CITEpsakabedoyan in jipa. We have not been able to confirm or reproduce such reports.

Some speakers likewise variably trill their flaps in certain environments (Seyfarth et al. review). Tabita Toparlak notes that in her impression, the Lebanese rhotic sounds like a trill more often than the Lebanese rhotic.

### 3.1.6 Lateral

Western Armenian has a lateral /l/ (Table 3.9).

Table 3.9: Near-minimal pairs for lateral /l/

	Initial		Intervocalic		Final
/l/	lajn ‘wide’ լայն		t <sup>h</sup> a <sup>h</sup> lar ‘green’ դալար		k <sup>h</sup> al ‘to come’ գալ
	la <sup>h</sup> sox ‘crier’ լացող		hala <sup>h</sup> dzet ‘to persecute’ հալածել		sə <sup>h</sup> al ‘wrong’ սխալ

The liquid /l/ is palatal. The lateral is a clear lateral and there is no allophonic lateral darkening or lateral velarization for the Lebanese community. Tabita Toparlak reports that Armenians in Istanbul often velarize the lateral [ɭ] because of influences from Turkish. As of writing, we don’t know the conditions for lateral velarization for Istanbul Armenian.



### 3.1.7 Glides

Western Armenian has a phonemic glide /j/ that is used throughout the language. The sound /w/ also exists as a marginal phoneme that's restricted to a small set of loanwords, mostly recent. This sound is usually nativized with [v]. See Table 3.10.

Table 3.10: Near-minimal pairs for glides

	Initial		Intervocalic		Final	
/j/	jerk <sup>h</sup>	‘song’	t <sup>h</sup> i'jag	‘corpse’	‘χoj	‘ram’
		եօթ		դիակ		խոյ
	jav'rig	‘dear’	mija'nal	‘to unite’	t <sup>h</sup> ej	‘tea’
		եարիկ		միանալ		թէյ
/w/	wik <sup>h</sup> ip <sup>h</sup> ed'ja	‘Wikipedia’	sam'wel	‘Samuel’		
	vik <sup>h</sup> ip <sup>h</sup> ed'ja	Ուիքիփետիա	sam'vel	Սամուէլ		

The glide [j] has a rather complex distribution. Word-initially, it is mostly found before the vowel [e]. Orthographically, the word-initial [je] is written as just ե <e> . The high rate of word-initial [je] sequences is due to a process of glide-epenthesis, discussed in (cite chapter diphthongization). Outside of [je] sequences, word-initial [j] is rarely found. Some common natives word with initial [jV] where V is not /e/ include the words for ‘seven’ and ‘oil’, and their derivations. There are some. loanwords with [ja]. These were borrowed and adapted from Turkish ‘yavru’ and its related forms<sup>2</sup>.

Table 3.11: Distribution of the glide [j] word-initially

[je]	'jez	‘ox’	je'raz	‘dream’
	եզ	<ez>	երազ	<eraz>
[jo]	'jot <sup>h</sup>	‘seven’	jot <sup>h</sup> nam'ja	‘septennial’
	եօթ	<eōt'>	եօթնամեայ	<eōtnameay>
[ju]	'juʁ	‘oil’	ju'ʁod	‘oily’
	իւղ	<iwʁ>	իւղոտ	<iwʁod>
[ja]	'jav'rəm	‘my dear’	jav'rig	‘dear’
	եարըմ	<eawrəm>	եարիկ	<eawrig>

Word-medially, most occurrences of [j] are epenthetic. See Table 3.12. Inserting [j] is a common repair for vowel-vowel sequences, i.e., vowel hiatus (see Section

<sup>2</sup><https://en.wiktionary.org/wiki/yavru>

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§4.7). There are some morphemes where the surface [j] is not epenthetic and is adjacent to a consonant. These morphemes can be either roots or suffixes. Their syllabification is complicated, see Section §4.6.2.

Table 3.12: Distribution of the glide [j] word-medially

Epenthetic		Root-medial		Suffix-initial	
/V-V/→[VjV]	cf.	/CjV/	/Vj(C)/	/C-jV/	cf.
/k <sup>h</sup> odi + e/	/k <sup>h</sup> odi/	/arakh <sup>h</sup> jal/	/k <sup>h</sup> ajl/	/p <sup>h</sup> ajd + ja/	/p <sup>h</sup> ajd/
k <sup>h</sup> odi <sup>j</sup> e	k <sup>h</sup> o <sup>j</sup> di	arakh <sup>h</sup> jal	'k <sup>h</sup> ajl	p <sup>h</sup> ajd <sup>j</sup> ja	'p <sup>h</sup> ajd
'belt-ABL'	'belt'	'apostle'	'wolf'	'wooden'	'wood'
գօտիէ	գօտի	առաքեալ	փայտեալ	գայլ	փայտ
<kōdiē>	<kōdi>	<arakh <sup>h</sup> eal>	<p <sup>h</sup> aydeay>	<kayl>	<p <sup>h</sup> ayd>
/gadu + ov/	/gadu/	/marjam/	/k <sup>h</sup> ujn/	/gadar + jal/	/gadar/
gadu <sup>j</sup> ov	ga <sup>j</sup> du	mar <sup>j</sup> jam	'k <sup>h</sup> ujn	gadar <sup>j</sup> al	ga <sup>j</sup> dar
'cat-INS'	'cat'	'Mary'	'color'	'perfect'	'end'
կատունով	կատու	Մարիամ	գոյն	կատարեալ	կատար
<gadowov>	<gadow>	<mariam>	<koyn>	<gadareal>	<gadar>

In the phonology of Armenian, some have argued that [j] is a separate phoneme /j/ (Fairbanks 1948: 10). In contrast, Vaux (1998: 12-3) argues that there is no phonemic /j/. He argues that non-epenthetic cases of surface [j] are due to allophony from underlying /i/. For example, the bi-morphemic word [gadar-jal] 'perfect' would be analyzed as underlyingly /gadar-ial/ (Vaux 1998: 28). And similarly, the name [marjam] 'Mary' would be derived from underlying /mariam/. He would analyze [j] as derived from /i/ via some rule of vowel-hiatus repair. His evidence is based on diachrony and orthography. The classical orthography represents the word-medial surface [ja] via various diagraphs, such as եւ <ea> or <ia>.

But in our native intuitions, such cases of non-epenthetic [j] are not due to allophony at all but are from an underlying /j/. The fact that the digraph sequence <ea> or <ia> is pronounced as [ja] is just a spelling-pronunciation rule. Furthermore, there are no morpheme-alternations to support treating these non-epenthetic [ja] sequences as anything other than /ja/.

Word-finally (Table 3.13), the glide [j] is found only in monosyllabic nouns and in compounds where the second member is a monosyllabic noun. For some polysyllabic words and monosyllabic verbs, the orthography has a final <y> letter but this letter is silent. Such a glide was pronounced in Classical Armenian, but has been lost in the modern language CITEpmacak.

Table 3.13: Distribution of the glide [j] word-finally

Monosyllabic noun and derivatives		Monosyllabic non-noun	Polysyllabic
/paj/	/mag + paj/	/ga/	/agra/
p <sup>h</sup> aj	mag'paj	'ga	ag'ra
'verb'	'adverb'	'exists.PRS.3SG'	'witness'
բայ	մակբայ	կայ	ակռայ
<pay>	<magpay>	< gay>	<agrāy>
/haj/	/iran + a + haj/	/la/	/k <sup>h</sup> ulba/
'haj	irana'haj	'la	k <sup>h</sup> ul'ba
'Armenian	'Iranian Armenian'	'cries.PRS.3SG'	'sock'
հայ	իրանահայ	լայ	գուլպայ
<hay>	<iranahay>	<lay>	<kowlbay>

For the above polysyllabic words, Vaux (1998: 20) treated the silent letter յ <y> as indicating an underlying glide /j/ that got deleted. We disagree with his analysis. Our native intuitions don't 'feel' that there is any such glide. The orthography just has a silent letter. See discussion of the silent glide in Section §2.2, in regards to glide epenthesis and rule reversal.

## 3.2 Vowels

### 3.2.1 Canonical vowels

Armenian uses the following core vowels: /a, e, i, o, u/. These vowels can be used in all phonological and prosodic positions. Table 3.14 lists words which have a core vowel in either a stressed or unstressed position. Stress is final.

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Table 3.14: Near-minimal pairs for core vowels /a, e, i, o, u/

	<u>σ</u>	<u>σ</u> σ	<u>σ</u> σ
/a/	tʰad 'cause' նատ bakʰ 'fast' պաք	dzakʰum 'origin' ծագում sa'lor 'plum' սալոր	tʰutʰag 'parrot' թութակ je'lag 'strawberry' ելակ
/e/	seχ 'melon' սեխ sev 'black' սե	kʰe'din 'ground' գետին pʰe'dur 'feather' փետուր	lu'dzel 'to solve' լուծել ha'mex 'tasty' համեղ
/i/	kʰitʰ 'nose' քիթ pʰix 'elephant' փիղ	kʰidag 'adept' գիտակ tʰidel 'to watch' դիտել	pʰa'rikʰ 'good deed' բարիք tʰo'nir 'tandoor' թոնիր
/o/	gox 'rib' կող botʃ 'tail' պոչ	vo'rag 'quality' որակ kʰo'mef 'buffalo' գովէջ	li'mon 'lemon' լիմոն he'ros 'hero' հերոս
/u/	nur 'pomegranate' նուռ ʃukʰ 'shadow' շուք	su'litʃ 'whistle' սուլիչ pʰu'zoʁ 'healer' բուժող	mo'rukʰ 'beard' մորուք si'run 'lovely' սիրուն

The vowels can likewise be used in any position. Table 3.14 listed target vowels in either the first or second (stressed) syllable. Table 3.15 lists words where the vowel is in a word-medial unstressed syllable.

Table 3.15: Core vowels /a, e, i, o, u/ in word-medial unstressed position

/a/	juna'ren 'Greek language' յունարէն	jeza'gi 'singular' եզակի	hoʁa'tʰapʰ 'slipper' հողաթափ
/e/	naɾəntʃe'ni 'orange-tree' նարնջենի	ave'dis 'good news' աւետիս	ahre'li 'horrible' ահռելի
/i/	vosti'gan 'police officer' նստիկան	ori'nag 'example' օրինակ	jori'nel 'to fashion' յօրինել
/o/	aχor'zag 'appetite' ախորժակ	aso'ri 'Assyrian' ասորի	aɽgo'xin 'bed' անկողին
/u/	bajtʰu'tsig 'firework' պայթուցիկ	tʰitsu'hi 'goddess' դիցուհի	arkʰu'ni 'royal' արքունի

Synchronically, there is no rule of reducing or deleting unstressed word-medial vowels. But diachronically, there have been idiosyncratic cases where a word would lose its medial vowel. We call such a process ‘syncope’. Syncope is not synchronically active but is part of a fossilized set of morphologically-conditioned alternations. We discuss syncope in (syncope chapter).

The core vowels can be used in virtually any type of phonologically-possible syllable. They can be used in a syllable with or without an onset, and with or without coda (Table 3.16).

Table 3.16: Core vowels in different types of syllables

	VC	VCC	CVC	CVCC
/a/	‘ap <sup>h</sup> ’ ‘palm’ ափ	‘aχt’ ‘disease’ ախտ	‘bab’ ‘pope’ պապ	‘p <sup>h</sup> aχt’ ‘luck’ բաղդ
/e/	‘etʃ̥’ ‘page’ էջ	‘etʃk <sup>h</sup> ’ ‘descent’ էջք	‘ged’ ‘dot’ կէտ	‘p <sup>h</sup> ert <sup>h</sup> ’ ‘fortress’ բերդ
/i/	‘iʒ’ ‘viper’ իժ	‘intʃ̥’ ‘what’ ինչ	‘bidz’ ‘stain’ բիծ	‘k <sup>h</sup> imk <sup>h</sup> ’ ‘palate’ քիմք
/o/	‘ot <sup>h</sup> ’ ‘air’ օդ	‘ort <sup>h</sup> .nel’ ‘to bless’ օրհնել	‘tsor’ ‘valley’ ծոր	‘p <sup>h</sup> orts̥’ ‘attempt’ փործ
/u/	‘uʃ̥’ ‘late’ ուշ	‘uχd’ ‘camel’ ուղտ	‘tsul’ ‘bull’ ցուլ	‘dzunʒ̥’ ‘knee’ ծունկ

There are some asymmetries when it comes to word-initial vowels. Based on a word count from a digitized version of Kouyoumdjian (1970)’s dictionary, Table 3.17 lists the number of words which start with a core vowel. The most common initial vowel is /a/, while the rarest is /e/. The other core vowels /i, o, u/ occupy an intermediate spot.

Table 3.17: Number of words with an initial core vowel /a, e, i, o, u/

Vowel	/a/	/e/	/i/	/o/	/u/	Total
Count	7050	58	736	680	662	9839
Percentage	76.75%	0.63%	8.01%	7.40%	7.21%	100%

The reason for the relative rarity of word-initial /e/ is due to diachronic sound changes. A series of sound changes from Classical Armenian to Modern Armenian caused the initial [e] sound from Classical Armenian to become [je] in Modern Armenian, while a Classical initial [ē] sound became modern [e]. Such sound

changes are reflected in the orthography ([cite chapter diphthongization](#). The letter Է <ē> is used to mark a word-initial [e], while the letter ե <e> is used to mark a word-initial [je]. We discuss the phonological and morphological effects of these pronunciation rules in ([diphthonziation chapter](#)).

In terms of acoustics, there have been past studies on the acoustics of Armenian vowels, both Western and Eastern [CITEUCKET](#). One of the largest studies for Western Armenian is [Toparlak \(2019\)](#), which was later interpreted by [Seyfarth et al. \(review\)](#). We showed the vowel space in Figure 3.2.

For the mid vowels /e, o/, most previous phonological studies of Armenian transcribe the mid vowels as lax /ɛ, ɔ/. These studies include [BUCLET](#). However acoustically, these vowels are quite close to [e, o] and we transcribe them as /e, o/. Furthermore, our native intuitions don't hear a clear difference between between [e, o] and [ɛ, ɔ]. This suggests that the Armenian mid vowels can phonetically range from [e, o] and [ɛ, ɔ] as a type of free variation.

#### 3.2.2 Phonology of the schwa

The schwa vowel /ə/ has a complicated treatment in Armenian linguistics and philology. These complications involve a) disagreement over its phonemic status, b) orthographic representations of the schwa, and c) origin of the schwa as being derived or underived.

In terms of the phonological status of the schwa, most occurrences of the schwa are due to morpho-phonological processes. These processes are closely tied to the orthography. All these interactions have caused some to argue that the schwa is not a phoneme. We disagree with this stance and treat the schwa as a phoneme. We first go over asymmetries in the distribution of schwas (§3.2.2.1), the derived role of the unwritten schwa (§3.2.2.2), and the phonemic status of underived and written schwas (§3.2.2.3).

##### 3.2.2.1 Minimal pairs and asymmetries

In terms of phonemic status, some sources treat the schwa as a phoneme in Armenian [cite bucket](#). As a phoneme, the schwa can be used to form minimal or near-minimal pairs with other vowels. We provide such pairs in Table 3.18.

Table 3.18: Near-minimal pairs for the schwa against core vowels

/ə, a/	gə'rag	'fire' կրակ	gɑ'rak <sup>h</sup>	'butter' կարագ
/ə, e/	hə'rad	'Mars' Հրատ	he'ru	'far' հեռու
/ə, i/	mə'nal	'to stay' մնալ	mi'nag	'alone' միևսակ
/ə, o/	t <sup>h</sup> ə'k <sup>h</sup> al	'spoon' դգալ	t <sup>h</sup> o'k <sup>h</sup> axt	'tuberculosis' թոքախտ
/ə, u/	ʃə'fug	'whisper' շշուկ	ʃu'fan	'lily' շուշան

A schwa can be found in virtually any type of syllable (Table 3.19).

Table 3.19: Schwas in different types of syllables

VC	əs.kal	'to feel'	զգալ
VCC	əst.'rug	'slave'	ստրուկ
CV	'mar.t <sup>h</sup> ə	'man-DEF'	մարդը
CVC	p <sup>h</sup> ər.'t <sup>h</sup> el	'to break'	փրթել
CVCC	gərg.'nel	'to repeat'	կրկնել

However, the schwa is subject to more restrictions than other vowels. For example, there are virtually no native words where the only vowel is a schwa. The exceptions are a handful of onomatopoeic words, letter names, prepositions, and borrowings (Table 3.20). One common example is the derivational prefix /ənt<sup>h</sup>-/ which is diachronically derived from the archaic preposition of the same form.

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Table 3.20: Words where the only vowel is a schwa

'fər	'rustling sound'	onomatopoeic
	ֆըռ	
'ət <sup>h</sup>	'name of letter ը <ə>'	letter name
	ըթ	
'əst	'according to'	preposition
	ըստ	
'ənt <sup>h</sup>	'to'	preposition (archaic)
	ընդ	
ənt <sup>h</sup> -haga'rag	'on the contrary'	prefixed to /hagarag/ 'opposite'
	ընդհակառակ	հակառակ
fəs'təχ	'pistachio'	borrowed from Turkish "fıstık"
	ֆաստըխ	

#### 3.2.2.2 Phonology of unwritten schwas

Although there is a schwa grapheme <ը> /ə/, most instances of a spoken schwa are unwritten (Table 3.21). These unwritten schwas fall into different morphophonological categories: epenthetic schwas, reduced vowels, and syncopated vowels. The three categories for these unwritten schwas are summarized below.

Table 3.21: Categories of unwritten schwa

Type	Inserted	Reduced	Syncopated
Example:	գրպսն <krban> [k <sup>h</sup> ər'ban] 'pocket'	գծել <kdzel> [k <sup>h</sup> ə'dzel] 'to draw'	հասսկնալ <hasgnal> [haskə'nal] 'to understand'
Related:	N/A	գիծ <kidz> [k <sup>h</sup> idz] 'line'	հասկանալ <hasganal> [haska'nal] 'to understand (archaic)'

Most instances of the unwritten schwa are categorized as 'inserted' or 'epenthetic' schwas. These are schwas that surface in words like [k<sup>h</sup>ərban] 'pocket'. Such words do not have any morphologically-related word where the schwa is replaced by a non-schwa vowel, e.g., there is no such thing as word like \*k<sup>h</sup>irban.



Armenian orthography allows rather long clusters of consonants to be written. These clusters are broken up by a schwa in pronunciation. We discuss the phonology of such inserted schwas in (cite chapter schwa epenthesis).

The second category of schwas is reduced schwas. These are schwas which are derived from destressed high vowels /i,u/. Such schwas are created when words are derived from other words that have stress high vowels. For example, the word [kʰidz] ‘line’ has a stress high vowel /i/. The word [kʰə’dzel] ‘to draw’ is derived from this word by adding the suffix sequence /-el/. Stress shifts from the vowel /i/ to the suffix vowel /e/. This causes the high vowel to be replaced by a schwa in pronunciation. The orthography does not mark this schwa.

The derivation of schwas via high vowel reduction is quite complicated. We discuss the phonology/morphology of high vowel reduction in (cite chapter vowel reduction).

The last category of unwritten schwas is syncopated schwas. This set of words is rather small. These are words which, in earlier stages of the languages, had a word-medial and unstressed non-high vowel like /ɑ/: [haska'nal] ‘to understand (archaic)’. In more contemporary registers of the language, this word-medial vowel is either deleted or pronounced as a schwa: [haskə'nal]. The phonology and morphology of syncope is discussed in (cite syncope chapter).

Note that of the three categories, schwa insertion/epenthesis and high vowel reduction are synchronically productive and wide-spread in the Armenian lexicon. The third category, syncope of non-high vowels, is unproductive and limited to a small set of words. Syncope is more a sporadic diachronic process than a productive synchronic process. Speakers have to memorize the set of words which have a syncope-derived schwa.

### 3.2.2.3 Phonology of written schwas

Because of the existence of epenthesis and vowel reduction, some phonological treatments of Armenian treat the schwa as a non-phoneme cite. Such work argues that the schwa is always epenthetic or derived, and thus not part of the phonemic inventory of the language. We disagree with this stance. Although it is true that most occurrences of the schwa are derived from epenthesis and reduction, there are some words or morphemes where the schwa must be of the underlying form of the morpheme. In such cases, the orthography would represent the underlying schwa with the grapheme ղ.

The intuition among speakers is that if a pronounced schwa cannot be predicted from epenthesis and reductions, then it must be written in the orthogra-

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phy. Such cases are few, but they exist. They are found in both functional and non-functional morphemes.

Among functional morphemes (Table 3.22), the most common use of an underlying schwa is the definite suffix. This suffix is /-ə/ after consonants, and /-n/ after vowels. This allomorphy is discussed further in (cite definite alloomprohy). Another common case is the irregular ablative suffix for words of time: /-vəne/. This suffix is explained further in (cite irregular dative -van). In both of these cases, the schwa is written in the orthography with the grapheme ը <ə>. If the schwa was unwritten, then the word would be pronounced incorrectly.

Table 3.22: Functional morphemes with a written schwa

Definite			Ablative		
/-ə/	p <sup>h</sup> ar	p <sup>h</sup> ar-ə	/-vəne/	aj'sor	aj'sor-vəne
-ը	բառ	բառը	-ուրևի	այսօր	այսօրուրևի
<-ə>	<p'ar>	<p'arə>	<owəne>	<aysōr>	<aysōrowəne>
	'word'	'word-DEF'		'today'	'today-ABL'
		'the word'			'from today'
If unwritten:		p <sup>h</sup> ar			*aj'sorune
		'word'			nonce word

Among non-functional or lexical morphemes (Table 3.23), a written schwa is used when the word starts with a schwa. Such morphemes include verbs, nouns, and adjectives. If the schwa is unwritten, then a schwa would be epenthized in the wrong slot due to the rules for schwa epenthesis. There is likewise a derivational prefix /ənt-/ , described in (cite chapter prefixes). For these lexical morphemes, the initial schwa usually precedes a nasal sound.

Table 3.23: Non-functional or lexical morphemes with a written schwa

				If unwritten
Verb	ə'sel	'to say'	ըսել	*sel
	əm'bel	'to drink'	ըմպել	*məbel
Noun	əχ <sup>h</sup> tsank <sup>h</sup>	'desire'	ըղծանք	*χətsank <sup>h</sup>
	əj'ger	'friend'	ընկեր	*nəger
Adjective	ənda'ni	'familiar'	ընտանի	*nəđani
	əm'p <sup>h</sup> ost	'stubborn'	ըմբոստ	*məp <sup>h</sup> ost

In sum, the schwa is a controversial sound in Armenian. In many cases, a surface schwa is not present in the underlying form of words. Although such

derived schwas exists, there are likewise morphemes where the schwa is part of the underlying form of word. Because of the existence of these underived schwas, we treat the schwa as a phoneme.<sup>3</sup>

### 3.2.3 Front round vowels

The basic set of vowels in Western Armenian are the core vowels /ɑ, e, i, o, u/ and the schwa /ə/. However, due to contact with Turkish, Western Armenian has developed a sound /ɣ/ which is found across the Armenian lexicon. It like has developed a marginal phoneme /œ/ which is found in a handful of loanwords.

For /œ/ (Table 3.24), this vowel is written with the digraph ժօ <ēō> and is optionally nativized with /o/. This vowel developed out of contact with Ottoman Turkish and is found in a handful of loanwords from Ottoman Turkish. Speakers vary in the rate of nativizing such words. For example, HD's intuition is that in Lebanon, it is more common to nativize these words with /o/ than to use the marginal phoneme /œ/. The rate of nativization likely varies by area and age.

Table 3.24: Words with marginal phoneme /œ/

With /œ/	Nativized		Meaning & origin
ṭjœ'reg	ṭjo'reg	չէօրէկ	pastry item from Turkish “çörek”
bœ'reg	bo'reg	պէօրէկ	pastry item from Turkish “börek”
œze'ni	oze'ni	էօժէնի	fem. given name from French Eugénie
dœ'feg	do'feg	սէօջէկ	‘mattress’ from Turkish “döşek”
k <sup>h</sup> œ'fte	k <sup>h</sup> ofte	քէօֆթէ	‘kofte’ from Turkish “köfte”

We transcribe the vowel as /œ/, though we think it's free to vary with /ø/ without a consistent articulatory target.

More such loanwords are reported in Աճառեան (1902) study on Turkish borrowings in early modern Istanbul Armenian. We have not been able to extensively analyze this dictionary in order to find more such loanwords that survived into the colloquial Western of non-Istanbul Armenians.

For the vowel /ɣ/, its use is more complicated and is closely tied with the orthography. The Armenian script has the digraph իւ <iw> (Table 3.5.1). This digraph is pronounced as [iv] word-finally and before vowels in both Western and

<sup>3</sup>As an alternative, Vaux argues that the schwa is non-phonemic and always derived. For cases of written schwas that we argue are underived, like [əɲger] ‘friend’ ընկեր <ənger>, Vaux would argue that the underlying form has an empty vocalic slot /Vnger/. A rule would then fill these empty slots with epenthetic schwas. We don't entertain this analysis. **vaux**

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Eastern Armenian. Word-initially, this digraph is pronounced as [ju]. In all other positions, Eastern Armenian pronounces this digraph as [ju],<sup>4</sup> while Western Armenian generally uses [ɣ]. There are some complications with the nominalizing suffix /-utʰjɾn/ -*ութիւն*; discussed in Section §3.5.1.

Table 3.25: Pronunciations of the digraph *իւ* <iw>

	Western	Eastern			
Initial	<i>juɐ</i>	<i>juɐ</i>	‘oil’	<i>իւղ</i>	<iwɣ>
	<i>jurakʰanʰtʰjɾ</i>	<i>jurakʰanʰtʰjɾ</i>	‘each’	<i>իւրաքանչիւր</i>	<iwrakʰantʰiwr>
	<i>jurahaʰdug</i>	<i>jurahaʰtuk</i>	‘specific’	<i>իւրայատուկ</i>	<iwrayadowg>
Medial pre-C	<i>dʒɣɐ</i>	<i>tʰjuɐ</i>	‘branch’	<i>ճիւղ</i>	<dʒiwɣ>
	<i>aŋgɣn</i>	<i>aŋkjun</i>	‘corner’	<i>անկիւն</i>	<angiwn>
	<i>aʰɣɾ</i>	<i>aʰljɾ</i>	‘flour’	<i>ալիւր</i>	<aliwr>
Medial pre-V	<i>tiʰvan</i>	<i>diʰvan</i>	‘divan’	<i>դիւան</i>	<tiwan>
	<i>hiʰvantʰ</i>	<i>hiʰvand</i>	‘sick’	<i>հիւանդ</i>	<hiwant>
	<i>tʰivaʰgan</i>	<i>diʰvaʰkan</i>	‘diabolic’	<i>դիւական</i>	<tiwagan>
Final	<i>tʰiv</i>	<i>tʰiv</i>	‘number’	<i>թիւ</i>	<tʰiw>
	<i>aʰniv</i>	<i>aʰniv</i>	‘wheel’	<i>անիւ</i>	<aniw>
	<i>gəʰriv</i>	<i>kəʰriv</i>	‘fight’	<i>կռիւ</i>	<griw>

Within a morpheme, the segment [ɣ] is restricted to closed CVC(C) syllables. Suffixation can make this segment lose a coda: [hɣ.r-i] ‘guest-GEN’. The closest counter-examples we found were loanwords: [bɣtʰi] ‘Pythia’ *Պիւթի*.

As for needing an onset, some [ju]-initial words can be optionally pronounced with [ɣ] in Western: [ɣrakʰanʰtʰjɾ] ‘each’, [ɣrhaʰdug] ‘specific’.

Diachronically, the modern [ɣ] sound may have developed from an earlier [iɥ] sequence (Ավետիսյան 2015). This sequence changed to [ɣ], whether via dialect-internal sound changes, contact with other dialects, or via contact with Turkish.

The acoustic quality of this /ɣ/ can range from [ɣ] to [y]. Tabita Toparlak reports that for Istanbul Armenian is more like [y]. For Syrian Armenians, our impression is that their vowel is more often [ɣ]. Of course, in depth acoustic studies are needed to verify or disconfirm these impressions.

Depending on the word and speaker, the vowel [ɣ] can be replaced with [uj], [ɣj], [jɣ], [jɣ], [ju]. Table 3.26 lists a set of common words that are pronounced with [ɣ], along with possible alternative pronunciations from HD’s speech. Our impression is that this variation is a type of free variation that is closely tied to the speaker’s sociolinguistic origins. For example, HD reports that his family and

<sup>4</sup>In Eastern Armenian, when the digraph *իւ* in traditional spelling is pronounced as [ju], it is replaced by *յու* <yow> in the reformed spelling system.

peers in Lebanon would most often have the [ɤj] or [uj] forms. For HS from Syria, her own idiolect seems to almost always have [ɤ].

Table 3.26: Words with [ɤ] and alternative pronunciations

[ɤ]	[ɤj]	[uj]	[jɤ]	[ju]		
ʿtsɤn	ʿtsɤjn	ʿtsujn			‘snow’	ծիւն
ʿhɤr	ʿhɤjr	ʿhujr			‘guest’	հիւր
ʿnɤt <sup>h</sup>	ʿnɤjt <sup>h</sup>	ʿnujt <sup>h</sup>			‘topic’	նիւթ
ʿmɤs	ʿmɤjs	ʿmujs			‘other’	միւս
ʿk <sup>h</sup> ɤʁ	ʿk <sup>h</sup> ɤjʁ		ʿk <sup>h</sup> jɤʁ	ʿk <sup>h</sup> juʁ	‘village’	գիւղ
sɤˈnag	sɤjˈnag				‘column’	սիւնակ
hɤˈsis					‘north’	հիւսիս
ɑˈrɤn	ɑˈrɤjn	ɑˈrujn			‘blood’	արիւն
ɑˈʁɤs	ɑˈʁɤjs	ɑˈʁujs			‘brick’	աղիւս
ɑˈrɤdʒ	ɑˈrɤjdʒ	ɑˈrujdʒ			‘lion’	առիւծ
mərˈtʃɤn	mərˈtʃɤjn	mərˈtʃujn			‘ant’	մրջիւն
hənˈtʃɤn	hənˈtʃɤjn	hənˈtʃujn			‘sound’	հնչիւն
haˈrɤr	haˈrɤjr	haˈrujr			‘hundred’	հարիւր
zeˈp <sup>h</sup> ɤr	zeˈp <sup>h</sup> ɤjr	zeˈp <sup>h</sup> ujr			‘zephyr’	զեփիւռ
ɑχˈpɤr	ɑχˈpɤjr	ɑχˈpujr			‘fountain’	աղբիւր
əsˈpɤrk <sup>h</sup>					‘diaspora’	սփիւռք
ɑrˈt <sup>h</sup> ɤŋk <sup>h</sup>	ɑrˈt <sup>h</sup> ɤjŋk <sup>h</sup>	ɑrˈt <sup>h</sup> ujŋk <sup>h</sup>			‘result’	արդիւնք

Furthermore, there are reports that colloquial speech can reduce the Western [ɤ] vowel (Eastern [ju]) to a [u] in some high-frequency words **cite**. For example, in HD’s experience, some attested reduced words are [ʿtsun] ‘snow’ ծու instead of [ʿtsɤn] ծիւն.

Another rare pronunciation of [ɤ] is as [əju] or [əjɤ]. In HD’s judgments, such a division happens sometimes for word-initial [Cɤ] sequences like [k<sup>h</sup>əjuʁ, k<sup>h</sup>əjɤʁ] ‘village’ instead of [k<sup>h</sup>ɤʁ] ‘village’ գիւղ. We suspect that such a divided pronunciation is restricted to emphatic speech.

As a last note, there are little to no phonetic work on the [ɤ] sound. The only one to our knowledge is unpublished work by Hrayr Khanjian. **cite and expand**.

### 3.2.4 Turkish-induced centralization

In modern Western Armenian, it is unknown if there are any allophonic rules that affect vowels. The closest example that we know is vowel laxing in Turkish-

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speaking Armenians.

For speakers of Western Armenian who don't know Turkish, such as HD and the Lebanese community, the vowels /i, u, e, o/ are pronounced as just [i, u, e, o]. But it is reported that Western Armenian speakers who are Turkish-speaking apply an allophonic rule of changing /i, u, e, o/ to [ɪ, ʊ, ɛ, ɔ] when either word-final or before a vowel (Fairbanks 1948: 3-4).

*cite fairbanks data*

The main source for this process is Fairbanks who documents extensive allophonic laxing for his informants who were from Istanbul (Fairbanks 1948: 1). HS seems to show this allophonic process as well in her own speech. Although she was raised in Syria, her grandparents were Turkish-speaking and HS was raised as a Turkish-Armenian bilingual.

Because this process is specific to Turkish-speaking Armenians, we can't provide acoustic data on this because our main phonological informant (HD) is from Lebanon and doesn't speak Turkish.

It is an open question if this allophonic process is still active in the speech of Turkish-Armenian bilinguals in Istanbul.

## 3.3 Allophony of laryngeal processes

*does deaspiration happen in geminates?*

In terms of its phonemes, Western Armenian has voiced stops and voiceless aspirated stops. The stops however can change their voicing quality or aspiration quality depending on the phonological (phonotactic) context that they're used. Two such processes are deaspiration and voicing assimilation. Both processes tend to occur simultaneously.

Deaspiration is a process where a voiceless stop loses its aspiration (Rule 1). If a voiceless stop is part of an obstruent cluster, then it generally loses its aspiration. We found this process to be exceptionless in HD's speech for intervocalic clusters /VCCV/, but variable for word-final clusters /VCC#/ . Deaspiration can apply in different types of obstruent clusters, such as fricative-stop, stop-fricative, affricate-stop, stop-affricate, and stop-stop clusters.<sup>5</sup>

#### Rule 1. Deaspiration in obstruent clusters

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<sup>5</sup>We predict that affricates also undergo deaspiration after fricatives. However, the authors' subdialects (Syrio-Lebanese/USA) do not aspirate affricates in general. So we cannot test this hypothesis for now. Such a hypothesis can be tested with speakers from Turkey who do have aspirated affricates.

*Before or after a voiceless obstruent, voiceless stops are deaspirated.*

**Post-fricative deaspiration:** After a fricative, deaspirate a voiceless stop

/hast<sup>h</sup>/ → [hast] ‘thick’ հաստ

**Pre-fricative deaspiration:** Before a fricative, deaspirate a voiceless stop

/ap<sup>h</sup>se/ → [ap'se] ‘tray’ ափսէ

**Post-affricate deaspiration:** After an affricate, deaspirate a voiceless stop

/lutsk<sup>h</sup>i/ → [luts'ki] ‘match (fire)’ լոցկի

**Pre-affricate deaspiration:** Before an affricate, deaspirate a voiceless stop

/ak<sup>h</sup>tsan/ → ak'tsan ‘switch’ աքցան

**Stop-stop deaspiration:** In a stop-stop cluster, deaspirate a voiceless stop

/tsat<sup>h</sup>k<sup>h</sup>el/ → [tsat'kel] ‘to jump’ ցատքել

Voicing assimilation is when in a cluster of obstruents, the obstruents have to agree in voicing: either both voiced or both voiceless (Rule 2). When words are derived or morphemes are combined, we can get sequences of obstruents that underlyingly have different voicing qualities. But when pronounced, voiced obstruents become voiceless when next to a voiceless sound, regardless if the underlyingly voiced obstruent is before or after the voiceless obstruent.

When the underlyingly voiced sound is after the voiceless found, we find progressive assimilation. When the underlyingly voiced sound is before the voiceless found, we find regressive assimilation.

#### Rule 2. Voicing assimilation in obstruent clusters

##### **Progressive assimilation:**

*After another voiceless obstruent, a voiced obstruent becomes voiceless.*

/t<sup>h</sup>ant<sup>h</sup>ax-god/ → [t<sup>h</sup>ant<sup>h</sup>ax-'god] ‘slowish’ դանդաղկոտ

/vaχ-god/ → [vaχ-'kod] ‘cowardly’ վախկոտ

##### **Regressive assimilation:**

*Before another voiceless obstruent, a voiced obstruent becomes voiceless.*

/haleb/ → [haleb] ‘Aleppo’ Հալեպ

/haleb-tsi/ → [halep-'tsi] ‘Aleppoite’ հալեպցի

Voicing assimilation and stop deaspiration often apply in the same words, meaning they interact together. In terms of rule interaction, voicing assimilation feeds deaspiration: /haleb-tsi/ → //halep<sup>h</sup>-tsi// → [halep-tsi]. The end result is transparent application of both rules

The two processes can be found in both underived and derived context. A context is underived when the segments involved are part of the same root or morpheme, and they are always pronounced the way are. A context is derived when

it's created via combining morphemes or by applying word-internal changes. Because these processes apply in derived contexts, the same morpheme like 'Aleppo' [haleb] can change its pronunciation depending on the following morpheme: [halep-tsi] 'Aleppoite'.

The following subsections provide examples for both of these processes, both in derived and underived contexts. Data is organized by the subcategory of the process, i.e., post-fricative deaspiration vs. pre-fricative deaspiration. We distinguish between 2-consonant clusters (VCCV) and 3-consonant clusters (VCCCV). We first focus on intervocalic clusters, and then final clusters.

Note that some possible morphological exception to voicing assimilation are the passive suffix -v- and reduplication. The passive is discussed in Section §3.3.7.2 while reduplication are discussed in (cite chapter, include vazvezl types and gab-gabujd types, teptekin).

### 3.3.1 Post-fricative deaspiration (intervocalic)

We go over post-fricative deaspiration in underived contexts (§3.3.1.1) and derived contexts (§3.3.1.2).

#### 3.3.1.1 Underived contexts

Word-initially, the orthography has roots that start with a /s/-stop and /ʃ/-stop cluster. In Western Armenian, this cluster undergoes schwa prothesis: /st<sup>h</sup>or/ → [əstor] 'blind'. The sibilant causes the following voiceless stop to deaspirate (Table 3.27).

Table 3.27: Post-fricative deaspiration in root-initial sibilant-stop clusters (underived contexts)

/#st <sup>h</sup> V/ [əstV]	/ʃt <sup>h</sup> ab/ [əʃtab] <ʃdab>	'haste' շտապ	/ʃt <sup>h</sup> emaran/ [əʃtema'ran] <ʃdemaran>	'storehouse' շտեմարան	
/#sp <sup>h</sup> V/ [əspV]	/sp <sup>h</sup> anɑχ/ [əspa'nɑχ] <sbanax>	'spinach' սպանախ	/sp <sup>h</sup> asox/ [əspa'sox] <sbasoy>	'expectant' սպասող	/sp <sup>h</sup> idag/ [əspi'dag] <sbidag>
					'white' սպիտակ
/#st <sup>h</sup> V/ [əstV]	/st <sup>h</sup> anal/ [əsta'nal] <sdanal>	'to receive' ստանալ	/st <sup>h</sup> erdzel/ [əsteɾ'dzel] <sdeydzet>	'to create' ստեղծել	/st <sup>h</sup> or/ [əs'tor] <sdor>
					'blind (n)' ստոր
/#sk <sup>h</sup> V/ [əskV]	/sk <sup>h</sup> uf/ [əs'kuɸ] <zkoyf>	'careful' զգոյշ	/sk <sup>h</sup> al/ [əs'kal] <zkal>	'to feel' զգալ	/sk <sup>h</sup> esth/ [əs'kest] <zkesd>
					'clothing' զգեստ



There is evidence that the cluster lacks a schwa in the underlying or lexical representation. For discussion of schwa epenthesis and prothesis, see (cite [schwa epenthesis chapter](#)). Furthermore, many of these clusters orthographically have voiced stops like տ <d> in ստոր <sdor> [əstor] ‘blind’. This voiced stop is just an orthographic residue of diachronic sound changes. There is no synchronic evidence that the post-fricative stops in Table 3.27 are underlyingly voiced. For discussion of voicing mismatches with the orthography, see Section §2.4.2.

We likewise find deaspiration in word-medial intervocalic contexts (Table 3.28)■

Table 3.28: Post-fricative deaspiration in word-medial intervocalic sibilant-stop clusters (underived contexts)

/Vsp <sup>h</sup> V/ [VspV]	/tesp <sup>h</sup> areʒ/ [tes <sup>h</sup> pan] <tesban>	‘ambassador’ դեսպան	/asp <sup>h</sup> aʒeʒ/ [asp <sup>h</sup> aʒeʒ] <asbarēz>	‘career’ ասպարէզ
/Vst <sup>h</sup> V/ [VstV]	/ast <sup>h</sup> ar/ [as <sup>h</sup> tar] <asdar>	‘lining’ աստառ	/ast <sup>h</sup> iʒan/ [as <sup>h</sup> tiʒan] <asdidʒan>	‘degree’ աստիճան
/Vsk <sup>h</sup> V/ [VskV]	/ask <sup>h</sup> -er/ [as <sup>h</sup> ker] <azker>	‘nation-PL’ ազգեր	/gask <sup>h</sup> adʒ/ [gas <sup>h</sup> kadʒ] <gasgadʒ>	‘doubt’ կասկած
/Vft <sup>h</sup> V/ [VftV]	/haf <sup>h</sup> t <sup>h</sup> el/ [haf <sup>h</sup> tel] <hafdel>	‘to reconcile’ հաշտել	/ʃeft <sup>h</sup> oʁ/ [ʃef <sup>h</sup> toʁ] <ʃefdoʁ>	‘stressing’ շեշտող
/Vχt <sup>h</sup> V/ [VχtV]	/hax <sup>h</sup> t <sup>h</sup> ank <sup>h</sup> / [hax <sup>h</sup> tan <sup>h</sup> k <sup>h</sup> ] <haxdank>	‘victory’ յաղթանք	/χex <sup>h</sup> t <sup>h</sup> el/ [χex <sup>h</sup> tel] <xeydel>	‘to strangle’ խեղդել

### 3.3.1.2 Derived contexts

Table 3.29 list some of the few examples that we found for intervocalic post-fricative deaspiration. We find deaspiration. Table 3.29 lists cases where deaspiration is caused by adding a suffix with a voiced stop /g, b/ after a voiceless fricative. The fricative triggers deaspiration. Because the stop is underlyingly voiced, then it is devoiced and losses prevoicing.

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Table 3.29: Post-fricative deaspiration from suffixation in intervocalic (VCCV) derived contexts

Morpheme 1:	mə's-il	'to shiver'	մսիլ
Morpheme 2:	/-god/	derivational suffix	
→	[tʰantʰaɣ-'god]	'slowish'	դանդաղկոտ
	/məs-god/		
	məs-'kod	'chilly'	մսկոտ
Morpheme 1:	pampa's-el	'to gossip'	բամբասել
Morpheme 2:	/-god/	derivational suffix	
→	/pampas-god/		
	pampas-'kod	'gossipy'	բամբասկոտ
Morpheme 1:	[ba'h-el]	'to keep'	պահել
Morpheme 2:	/-ban/	nominalizing suffix for guarding	
	[tʰər-'ban]	'irrigation official'	ջրպան
Compare	tʰur	'water'	ջուր
→	/bah-ban/		
	bah-'pan	'guardian'	պահպան

Other derived contexts include vowel reduction (Table 3.30). The root consists of an underlying fricative-vowel-stop sequence. In compounds, the vowel is deleted,<sup>6</sup> and thus causing the fricative to precede the stop. The fricative deaspirates the stop, while the stop devoices the fricative.

Table 3.30: Post-fricative deaspiration from vowel reduction in intervocalic (VCCV) derived contexts

	[kʰa'vitʰ]	'courtyard'	գաւիթ
→	/kʰavitʰ-a-bah/	with compound linker /-a-/	
	[kʰaft-a-'bah]	'gatekeeper'	գաւթապահ

There are some derivational prefixes that end in a voiced fricative: synonymous [tʰəʒ-] or [dəʒ-] (Table 3.31). The fricative causes deaspiration of the following stop, and then gets devoiced.

<sup>6</sup>The deletion is due to destressed high vowel reduction. See (cite chapter reduction).

### 3.3 Allophony of laryngeal processes

Table 3.31: Post-fricative deaspiration after the derivational prefixes in VCCV contexts

		<b>p<sup>h</sup>axt</b>	‘luck’	բախտ
→	/təɜ-p <sup>h</sup> axt/	t <sup>h</sup> əf- <b>paxt</b>	‘unlucky’	դժբախտ
→	/dəɜ-p <sup>h</sup> axt/	dəf- <b>paxt</b>	‘unlucky’	տժբախտ
		<b>k<sup>h</sup>oh</b>	‘satisfied’	գոհ
→	/təɜ-k <sup>h</sup> oh/	t <sup>h</sup> əf- <b>koh</b>	‘dissatisfied’	դժգոհ
→	/dəɜ-k <sup>h</sup> oh/	dəf- <b>koh</b>	‘dissatisfied’	տժգոհ
		<b>k<sup>h</sup>ujn</b>	‘color’	գոյն
→	/təɜ-k <sup>h</sup> ujn/	t <sup>h</sup> əf- <b>kujn</b>	‘discolored’	դժգոյն
→	/dəɜ-k <sup>h</sup> ujn/	dəf- <b>kujn</b>	‘discolored’	տժգոյն

The above data concerned VCCV clusters where the cluster consists of only two consonants. We can also find a few cases where the cluster has 3 consonants VC<sub>1</sub>C<sub>2</sub>.C<sub>3</sub>V such that the C<sub>1</sub>C<sub>2</sub> form a complex coda (Table 3.32). Here again, we find deaspiration of C<sub>3</sub>. If C<sub>2</sub> is a voiceless obstruent and C<sub>3</sub> is voiced obstruent, we also find devoicing (loss of prevoicing).

Table 3.32: Post-fricative deaspiration in intervocalic VCCCV derived contexts

	<b>bar'sig</b>	‘Persian person’	պարսիկ
	[bars.k-e'ren]	‘Persian language’	պարսկերէն
	<b>'ajs + 'deɤ</b>	‘this’ + ‘place’	այս, տեղ
→	<b>ajs-'teɤ</b>	‘here, this place’	այստեղ
	<b>'ajs + 'k<sup>h</sup>an</b>	‘this’ + ‘much’	այս, քան
→	<b>ajs-'kan</b>	‘this much’	այսքան

#### 3.3.2 Pre-fricative deaspiration (intervocalic)

Compared to post-fricative stops, it is relatively rarer to find pre-fricative stops. In the few types of examples that we find, we also find pre-fricative deaspiration.

It is relatively rare to find roots with stop-fricative clusters (Table 3.33). Such clusters can be voiced or voiceless. When voiceless, the stop is unaspirated.

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Table 3.33: Pre-fricative deaspiration in VCCV clusters in underived contexts

/didʰos/	didʰos	‘title’	տիտղոս
/apʰse/	apʰse	‘tray’	ափսէ
/apʰʃ-um/	apʰʃum	‘surprise’	ապշում
/apʰsos/	apʰsos	‘alas’	ափսոս
/akʰsor/	akʰsos	‘exile’	աքսոր
/tʰatʰχ-el/	tʰatʰχel	‘to wet’	թաթխել

Many contexts for pre-fricative deaspiration come from derived contexts, such as come from vowel reduction of destressed /i,u/ (Table 3.34). Some cases come from reduction or syncope of /a/ in some roots.

Table 3.34: Pre-fricative deaspiration from vowel reduction and syncope in VC(C)CV derived contexts

	seʰbuh	‘gentleman’	սեպուհ
→	seph-aʰgan	‘appropriate’	սեպհական
	baʰgas	‘missing’	պակաս
→	bakʰs-il	‘to lessen’	պակսիլ
	ʃamʰpʰuʃ	‘foolish’	շամբուշ
→	ʃampʰʃ-aʰgan	‘foolish’	շամբշական
	əmʰpʰiʃ	‘athlete’	ըմբիշ
→	əmpʰʃ-aʰgan	‘athletic’	ըմբշական
	kʰəŋʰkʰuʃ	‘delicate’	քնքուշ
→	kʰəŋkʰʰʃ-aŋkʰ	‘delicacy’	քնքշանք
	gəŋʰkʰuʃ	‘hood’	կնգուղ
→	gəŋkʰʰχ-aʰvor	‘Capuchin friar’	կնգղատոր

Another context is the names for the days of the week (Table 3.35). These names are compounds without the linking vowel /-a-/. Note that the second root in these compounds changes its form, likely a type of allomorphy.

Table 3.35: Pre-fricative deaspiration in compounds for days of the week

	je'rek <sup>h</sup> + ʃa'p <sup>h</sup> at <sup>h</sup>	'two' + 'week'	երեք, շաբաթ
→	je'rek-ʃap'ti	'Tuesday'	երեքշաբթի
	/tʃorek <sup>h</sup> -/ + ʃa'p <sup>h</sup> at <sup>h</sup>	'quatro-' + 'week'	
→	tʃorek-ʃap'ti	'Wednesday'	չորեքշաբթի
	'hiŋk <sup>h</sup> + ʃa'p <sup>h</sup> at <sup>h</sup>	'five' + 'week'	հինգ, շաբաթ
→	hiŋk-ʃap'ti	'Thursday'	հինգշաբթի

Some numerals likewise show pre-fricative deaspiration (Table 3.36). These are formed from a root and decade suffix /-sun/.

Table 3.36: Pre-fricative deaspiration in some numerals

	'ut <sup>h</sup> + /-sun/	'eight' + '-th'	ութ
→	ut-'sun	'eighty'	ութսուն
Base	/vat <sup>h</sup> / + /-sun/	'hexa-' + '-th'	
→	vat-'sun	'sixty'	վաթսուն

Another context is passivization (Table 3.37). The passive suffix /-v-/ is devoiced after voiceless stops and triggers deaspiration. Note that the devoicing of passive /-v-/ is complicated. See Section §3.3.7.2. The gloss for active verbs is √-TH-INF, while for passives it's √-PASS-TH-INF.

Table 3.37: Pre-fricative deaspiration from passivization in VCCV derived contexts

Base	t <sup>h</sup> a'p <sup>h</sup> -e-l	'to throw away'	թափել
→	t <sup>h</sup> ap-'v-i-l	'to be thrown away'	թափուիլ
Base	χa'p <sup>h</sup> -e-l	'to trick'	խաբել
→	χap-'v-i-l	'to be tricked'	խաբուիլ
	noro'k <sup>h</sup> -e-l	'to restore'	նորոգել
→	norok-'v-i-l	'to be restored'	նորոգուիլ
	hava'k <sup>h</sup> -e-l	'to gather'	հավաքել
→	havak-'v-i-l	'to be gathered'	հավաքուիլ

### 3.3.3 Post-affricate deaspiration (intervocalic)

Similar to post-fricative deaspiration, we also have post-affricate aspiration. There are fewer examples of this process though.

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So far, we've only found one example of post-affricate deaspiration in a root (Table 3.38).

Table 3.38: Post-affricate deaspiration in intervocalic VCCV underived contexts

/lʊtskʰi/	lʊts'ki	'match (fire)'	լուցկի
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In derived contexts (Table 3.39), most but not all attested examples of post-affricate deaspiration simultaneously involve devoicing of the stop because the stop was underlyingly voiced.

Table 3.39: Post-affricate deaspiration in intervocalic VCCV derived contexts

Aorist stem:		mora <sup>ts</sup> -a <sup>dž</sup>	'forgotten'	մոռացած
→	/morats-god/	morats-'kod	'forgetful'	մոռացկոտ
→		p <sup>ats</sup> + p <sup>h</sup> e <sup>ran</sup>	'open' + 'mouth'	բաց, բերան
	/p <sup>h</sup> ats-p <sup>h</sup> eran]	p <sup>h</sup> ats-pe <sup>ran</sup>	'babbling'	բացբերան
→		'χatʃ + 'k <sup>h</sup> ar	'cross' + 'stone'	խաչ, քար
	/χatʃ-k <sup>h</sup> ar/	χatʃ-'kar	'cross-stone'	խաչքար
→		je'rets + 'gin	'elder' + 'woman'	երեց, կին
	/jerets-gin/	jerets-'kin	'pastor's wife'	երեցկին
→		'metʃ + 'deʁ	'in' + 'place'	մէջ, տեղ
	/metʃ -deʁ/	metʃ-'teʁ	'middle'	մէջտեղ
→		mi'tʃug	'nucleus'	միջուկ
	/mitʃug-aʃin/	mitʃk-a'ʃin	'nuclear'	միջկային
→		k <sup>h</sup> eʁe <sup>tsig</sup>	'pretty'	գեղեցիկ
	/k <sup>h</sup> eʁetsig-anal/	k <sup>h</sup> eʁetšk-a'nal	'to become pretty'	գեղեցկանալ

The above data concerned VCCV clusters where the cluster consists of only two consonants. We can also find cases where the cluster has 3 consonants VC<sub>1</sub>C<sub>2</sub>.C<sub>3</sub>V such that the C<sub>1</sub>C<sub>2</sub> form a complex coda (Table 3.40). Here again, we find deaspiration of C<sub>3</sub>. If C<sub>2</sub> is a voiceless obstruent and C<sub>3</sub> is voiced obstruent, we also find devoicing (loss of prevoicing).

Table 3.40: Post-affricate deaspiration in intervocalic VCCCV derived contexts

→	/ɑχtʃig-agan/	ɑχtʃig ɑχtʃ.k-a'gan	'girl' 'feminine'	աղջիկ աղջկական
Base		tʰapʰanʰtsig	'transparent'	թափանցիկ
→	/tʰapʰantsig-anal/	tʰapʰantsk-a'nal	'to become transparent'	թափանցկանալ
→	/horantʃ-god/	ho'rantʃ horantʃ-'kod	'yawn' 'yawning'	յօրանչ յօրանչկոտ

It should be noted that in these intervocalic VCCCV contexts, HD perceives a smaller degree of deaspiration than in VC.CV clusters. But based on observing the spectrograms, such clusters do show deaspiration and devoicing. It is possible that what HD perceives is incomplete neutralization, or that this is just a perceptual illusion.

### 3.3.4 Pre-affricate deaspiration (intervocalic)

Deaspiration can also apply before affricates.

So far, we've only found very few cases of deaspiration in underived contexts (Table 3.41).

Table 3.41: Pre-affricate deaspiration in underived contexts

/akʰtsan/	akʰtsan	'switch'	ափցան
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In derived contexts, stops deaspirate before affricates. A common morphological construction that shows this process is causativization. For the roots in Table 3.42, the root ends in either voiceless aspirated stop or a voiced stop. Aspiration is clearer when the stop is intervocalic. To form a causative verb, the suffix sequence /-tsən-e-l/ is added. The affricate causes devoicing and deaspiration.<sup>7</sup> This affects both VCCV and VCCCV clusters

<sup>7</sup>The gloss for /tsən-e-l/ is [CAUS-TH-INF].

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Table 3.42: Pre-affricate deaspiration before the causative suffix /-tsən-/  
/

		'mut <sup>h</sup> mu't <sup>h</sup> -e-n	'dark' 'dark (ABL-DEF)'	մութ մութէն
→	/mut <sup>h</sup> -tsən-e-l/	mut-tsə'n-e-l	'to darken'	մութցնել
		k <sup>h</sup> id-e-m	'I know (√-TH-1SG)'	գիտեմ
→	/k <sup>h</sup> id-tsən-e-l/	k <sup>h</sup> it-tsə'n-e-l	'to notify'	գիտցնել
		'dak <sup>h</sup> da'k <sup>h</sup> -e-n	'hot' 'hot (ABL-DEF)'	տաք տաքէն
→	/dak <sup>h</sup> -tsən-e-l/	dak-tsə'n-e-l	'to heat'	տաքցնել
		lok <sup>h</sup> -aŋk <sup>h</sup>	'bath (√-NMLZ)'	լոգանք
→	/lok <sup>h</sup> -tsən-e-l/	lok-tsə'n-e-l	'to notify'	լոգցնել
		χo'ruŋg	'deep'	խորունկ
→	/χorung-tsən-e-l/	χo'ruŋk-tsə'n-e-l	'to deepen'	խորունկցնել

Another case involves irregular verbs with an affricate infix. The roots in Table 3.43 have an underlying voiced stop. This voiced stop surfaces in some inflected forms when the stop is intervocalic. In their citation or infinitive form, the root takes a meaningless affricate suffix /-tʃ-/ suffix that triggers devoicing and deaspiration on the root's consonant.

Table 3.43: Pre-affricate deaspiration before the meaningless infix /-tʃ-/

		t <sup>h</sup> ə'b-α-v	'he touched'	√-PST-3SG	դպաւ
→	/t <sup>h</sup> əb-tʃ-i-l/	t <sup>h</sup> əp-tʃ-i-l	'to touch'	√-TH-INF	դպչիլ
		p <sup>h</sup> ə'g-α-v	'he stuck to'	√-PST-3SG	փակաւ
→	/p <sup>h</sup> əg-tʃ-i-l/	p <sup>h</sup> ək-tʃ-i-l	'to stick to'	√-TH-INF	փակչիլ

Vowel reduction can likewise create contexts for pre-affricate devoicing. All the examples in Table 3.44 involve roots that take a derivational suffix, either /-itʃ/ or /-gits/. When another derivational suffix is added, the vowel of /-itʃ/ is deleted, causing the consonants to become adjacent and trigger deaspiration.



Table 3.44: Pre-affricate deaspiration from vowel reduction in VC(C)CV contexts

noro <sup>h</sup> k-itʃ	‘reformer’	նորոգիչ
→ norok-tʃ-a'gan	‘of reforms (adj.)’	նորոգչական
nəvɑ <sup>h</sup> k-itʃ	‘musician’	նուագիչ
→ nəvɑk-tʃ-u'hi	‘fem. musician’	նուագչուհի
mija-gits	‘united’	միակից
→ mija-kts-u't <sup>h</sup> jɪn	‘junction’	միակցութիւն
χənt <sup>h</sup> ɑ-gits	‘united’	խնդակից
→ χənt <sup>h</sup> ɑ-kts-a'gan	‘junction’	խնդակցական
jer <sup>h</sup> k-itʃ	‘singer’	երգիչ
→ jerk-tʃ-u'hi	‘fem. singer’	երգչուհի

### 3.3.5 Deaspiration in stop-stop clusters (intervocalic)

In stop-stop clusters, voiceless stops are deaspirated in both underived and derived contexts.

In underived contexts (Table 3.45), it is relatively difficult to find intervocalic stop-stop clusters. There are some roots and bound roots which have such clusters. Here, we find that the two stops are either both voiced stops or both voiceless unaspirated stops. We do not find intervocalic clusters where either of the stops is aspirated.

Table 3.45: Intervocalic stop-stop restrictions in underived contexts

Voiced + Voiced	jek <sup>h</sup> ib'dos	‘Egypt’	եգիպտոս
	ab'dag	‘slap’	ապտակ
	p <sup>h</sup> eg'd-el	‘to break’	բեկտել
Voiceless + Voiceless	bat'kom	‘message’	պատգամ
	tsat <sup>h</sup> k-el	‘to jump’	ցատքել
* Aspirated + Stop	*bat <sup>h</sup> gam		
	*bat <sup>h</sup> k <sup>h</sup> am		
* Stop + Aspirated	*bagt <sup>h</sup> am		

More cases are found in derived contexts, when a voiceless aspirated stop becomes adjacent to another stop. For the derived contexts in Table 3.46, the voiceless stop precedes an underlyingly voiced stop. The voiced stop devoices due to voicing assimilation. Both stops become voiceless, and neither of them is aspirated.

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Table 3.46: Stop-stop deaspiration in derived /VCCV/ contexts where the first is voiceless and second is voiced

Bases	t <sup>h</sup> ak <sup>h</sup> + 'gab	'crown' + 'link'	թագ, կապ
→	t <sup>h</sup> ak-kab-u't <sup>h</sup> un	'coronation'	թագկապութիւն
	χa'nut <sup>h</sup>	'store'	խանութ
→	χanut-'pan	'shopkeeper'	խանութպան
	o'k <sup>h</sup> ud	'benefit'	օգուտ
→	okt-a'gar	'useful'	օգտակար

This constraint is likewise active in /VCCCV/ contexts. For the words in Table 3.47, the voiceless stop is underlyingly aspirated and part of a complex coda. In derivation, the voiceless stop precedes a voiced stop. Both stops become voiceless unaspirated.

Table 3.47: Stop-stop deaspiration in derived /VCCCV/ contexts where the second is voiceless and third is voiced

	p <sup>h</sup> a'p <sup>h</sup> ug	'delicate'	փափուկ
→	p <sup>h</sup> ap.k-a'gan	'delicate'	փափկական
	t <sup>h</sup> əm'p <sup>h</sup> ug + ha'r-el	'drum' + 'to beat'	թմբուկ, հարել
→	təmp.k-a'har	'drummer'	թմբկահար
	k <sup>h</sup> ən't <sup>h</sup> ig + 'k <sup>h</sup> ar	'marble' + 'rock'	գնդիկ, քար
→	k <sup>h</sup> ənt.k-a-'k <sup>h</sup> ar	'globulite'	գնդկաքար
	sən't <sup>h</sup> ig	'mercury'	սնդիկ
→	sənt.k-a'jin	'mercurial'	սնդկային

#### 3.3.6 Deaspiration in final clusters

The previous sections focused on deaspiration in word-medial contexts. Word-finally, we think there is deaspiration, in both underived contexts (§3.3.6.1) and derived contexts (§3.3.6.2).

But there is some variation. The main problem is that it's difficult to accurately measure aspiration in word-final stops. When a word was said in isolation, we noticed an audible release and some degree of noise: [ask<sup>h</sup>] 'nation'. But it's not always clear if this 'noise' is aspiration or just noise. Once these final clusters were placed in the middle of a sentence (before a vowel), then the aspiration was gone [ask əsav] 'he said nation'. For consistency, we transcribe these final clusters as deaspirated even for words in isolation.

## 3.3.6.1 Undersived contexts

Among undersived contexts, deaspiration can apply in word-final clusters (Table 3.48).<sup>8</sup>

Table 3.48: Post-fricative deaspiration in word-final sibilant-stop clusters (undersived contexts)

/Vsp <sup>h</sup> #/ [Vsp#]	/barisp <sup>h</sup> / [ba'risp]	'fortress'	պարիսպ <barisb>	/zusp <sup>h</sup> / ['zusp]	'restrained'	զուսպ <zowsb>
/Vst <sup>h</sup> #/ [Vst#]	/badrast <sup>h</sup> / [bad'rast]	'ready'	պատրաստ <badrasd>	/χist <sup>h</sup> / ['χist]	'strict'	խիստ <xisd>
/Vsk <sup>h</sup> #/ [Vsk#]	/ask <sup>h</sup> / ['ask]	'nation'	ազգ <azk>	/isk <sup>h</sup> / ['isk]	'but'	իսկ <xisg>
/Vjt <sup>h</sup> #/ [Vjt#]	/dʒift <sup>h</sup> / [dʒift]	'correct'	ճիշդ <dʒift>	/guft <sup>h</sup> / ['guft]	'sated'	կուշտ <gowfd>
/Vxp <sup>h</sup> #/ [Vxp#]	/axp <sup>h</sup> / ['axp]	'trash'	աղբ <ayp>	/(v)oxp <sup>h</sup> / ['voxp]	'lament'	ողբ <xisg>
/Vxt <sup>h</sup> #/ [Vxt#]	/axt <sup>h</sup> / ['axt]	'disease'	ախտ <axd>	/k <sup>h</sup> axt <sup>h</sup> / ['kaxt]	'emigration'	գաղթ <kayt>

Note that although we transcribe these stops as deaspirated, it is possible that there is some degree of aspiration. The degree of aspiration for final post-fricative stops seems to be weaker than when the stop is intervocalic. Furthermore, word-finally, the stop is often produced with a perceivable release. It's difficult to tease apart aspiration and just audible releases: [ask<sup>(h)</sup>] 'nation'. If the word is however sentence-medial, then aspiration is fully absent (1).

- (1) ask    əs-ɑ-v        'He said "nation".  
       nation say-PST-3SG  
       «Ազգ» ըսավ:

## 3.3.6.2 Derived contexts

Word-finally in derived contexts, a VCC or VCCC cluster is formed by adding the nominalizer suffix /-k<sup>h</sup>/.

The suffix can derive nouns from roots and from other words. Its syllable structure is quite complicated, and it is often analyzed as an extrasyllabic appendix

<sup>8</sup>To understand why the word 'lament' is underlyingly /(v)oxp<sup>h</sup>/ with (v), see (cite chapter diphthongization).

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(§4.2.3). When this suffix is word-final after a fricative, it has some degree of aspiration in our recordings when uttered in isolation. But when another inflectional suffix is added, this /-k<sup>h</sup>/ becomes word-medial and fully deaspirates.<sup>9</sup> Furthermore, if the word is sentence-medial, then aspiration is again fully lost. We first show data from VC-k<sup>h</sup> contexts (Table 3.49).

Table 3.49: Variable post-fricative deaspiration for the suffix /-k<sup>h</sup>/ in VC-k<sup>h</sup> contexts

	tə'zoχ	‘hard’	դժոխ
Derived	tə'zoχ-k <sup>(h)</sup>	‘hell’	դժոխք
Inflected	təzoχ-'k-ov	‘hell-INS’	դժոխքով
	təzoχ-k-'ner	‘hell-PL’	դժոխքներ
Root	/hɾɑf-/	bound root as in...	
	həɾɑf-ɑ'li	‘marvelous’	հրաշալի
Derived	hə'ɾɑf-k <sup>(h)</sup>	‘miracle’	հրաշք
Inflected	həɾɑf-'k-i	‘miracle-GEN’	հրաշքի
	həɾɑf-k-'ner	‘miracle-PL’	հրաշքներ
Root	/des-/	bound root as in...	
	də's-ɑdz	‘seen’	սեսած
Derived	'des-k <sup>(h)</sup>	‘sight’	հրաշք
Inflected	des-'k-i	‘sight-ABL’	սեսքէ
Root	/χos-/	bound root as in...	
	χo's-il	‘to speak’	խօսիլ
Derived	'χos-k <sup>(h)</sup>	‘speech’	խօսք
Inflected	χos-'k-er	‘speech-PL’	խօսքեր

If the fricative is part of a complex coda, we also find that the /-k<sup>h</sup>/ seems to resist deaspiration in isolation (Table 3.50). Deaspiration is more visible when this segment becomes word-medial by adding inflectional suffixes, or even sentence-medial.

<sup>9</sup>Between a fricative and consonant (/VC-k<sup>h</sup>-CV/), the suffix /-k<sup>h</sup>/ tends to significantly overlap with the preceding fricative. This suggests some type of gestural overlap.

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Table 3.50: Variable post-fricative deaspiration for the suffix /-k<sup>h</sup>/ in VC-k<sup>h</sup> contexts

Base	'bars	'Persian (archaic)	պարս
Derived	'bars-k <sup>(h)</sup>	'Persia	Պարսք
Inflected	bars-'k-e-n	'Persia-ABL-DEF'	Պարսքէն
Base	'vars	'hair (archaic)	վարս
Derived	'vars-k <sup>(h)</sup>	'hair of head	վարսք
Inflected	vars-'k-ov	'hair-INS'	վարսքով

The same patterns are found when the preceding consonant is a voiceless affricate (Table 3.51).

Table 3.51: Variable post-affricate deaspiration for the suffix /-k<sup>h</sup>/ in VC-k<sup>h</sup> contexts

Base	'metʃ	'in'	մէջ
Derived	'metʃ-k <sup>(h)</sup>	'waist'	մէջք
Inflected	metʃ-'k-e	'waste-ABL	մէջքէ
Base	t <sup>h</sup> ə'ritʃ	'flight'	թռիչ
Derived	t <sup>h</sup> ə'ritʃ-k <sup>(h)</sup>	'flight'	թռիչք
Inflected	təritʃ-'k-i	'flight-GEN	թռիչքի
	təritʃ-k-'ner	'flight-GEN	թռիչքներ
Aorist stem	urets-adz	'swollen'	ուռեցած
Derived	u'rets-k <sup>(h)</sup>	'swelling (n)'	ուռեցք
Inflected	urets-'k-ov	'swelling-INS	ուռեցքով
	urets-k-'ner	'swelling-PL	ուռեցքներ
Aorist stem	ləvats-ox	'washer'	լուացող
Derived	ləvats-k <sup>(h)</sup>	'laundry'	լուացք
Inflected	ləvats-'k-ov	'laundry-GEN	լուացքի
	ləvats-k-'ner	'laundry-PL	լուացքներ

We find the same variation when the affricate is part of a complex coda (Table 3.52).

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Table 3.52: Variable post-affricate deaspiration for the suffix /-k<sup>h</sup>/ in VCC-k<sup>h</sup> contexts

Base	'varts	'reward	վարձ
Derived	'varts-k <sup>(h)</sup>	'wage	վարձք
Inflected	varts-'k-er	'wage-PL	վարձքեր
Base	'vertʃ	'end	վերջ
Derived	'vertʃ-k <sup>(h)</sup>	'edge	վերջք
Inflected	vertʃ-'k-i-n	'edge-PL	վերջքիս
Base	zə'rujts	'tale	գրոյց
Derived	zə'rujts-k <sup>(h)</sup>	'conversation	գրոյցք
Inflected	zərujʃ-'k-e	'tale-ABL	գրոյցքէ
	zəruʃʃ-'k-ner	'tale-PL	գրոյցքներ
Base	ba'hantʃ	'demand	պահանջ
Derived	ba'hantʃ-k <sup>(h)</sup>	'credit	պահանջք
Inflected	bahantʃ-'k-ov	'credit-INS	պահանջքով
	bahantʃ-'k-ner	'credit-PL	պահանջքներ

After a stop, the suffix /-k<sup>h</sup>/ causes devoicing and deaspiration of the stop. The suffix has the same variable deaspiration as before. Note that many of the roots in Table 3.53 are bound roots. Many also involve vowel reduction.

Table 3.53: Stop-stop deaspiration in derived /VC-k<sup>h</sup>/ contexts

	'hed	'with'	հետ
→	'het-k <sup>(h)</sup>	'trace'	հետք
	ɑʁot <sup>h</sup> -	bound root for praying	
	ɑʁo't <sup>h</sup> -el	'to pray'	աղօթել
→	ɑ'ʁot-k <sup>(h)</sup>	'trace'	աղօթք
	vod-	bound root for feet	
	vo'd-ig	'tiny foot'	նոսիկ
→	'vot-k <sup>(h)</sup>	'foot'	նոք
	mid-	bound root for mind	
	məd-a'jin	'mental'	մտային
→	'mit-k <sup>(h)</sup>	'mind'	միտք

We acknowledge though that the lack of deaspiration of /-k<sup>h</sup>/ is confounded with how this segment is word-final and said in isolation. It's possible that this segment is truly deaspirated after all fricatives/affricates even in isolation. But

by being word-final in isolation, the stop gets some degree of intonational prominence, noisy enhancement, a stronger release, or breathiness.

As of writing this grammar, we have not been able to do a systematic acoustic study of this suffix's deaspiration across multiple speakers. That seems like a worthwhile future research question.

### 3.3.7 Obstruent voicing assimilation

make a separate subsection for v and then check that any of the refs to assimilation should be redirected to v instead

Voicing assimilation is when in a consonant cluster  $C_1C_2$ , the two consonants have identical voicing quality. Such a cluster consists of two obstruents (stop, affricate, fricative). Either both consonants are voiced or both are voiceless.

This behavior seems exceptionless within roots. In the previous sections, we listed various underived contexts for deaspiration. All these contexts also had the obstruents match in voicing. Although the orthography may suggest that within a morpheme, the two consonants of a root have different voicing, the consonants are always pronounced with the same voicing quality. In this case, it's more accurate to say that this is a phonology-orthography mismatch (§2.4.2), rather than a synchronic phonological rule that changes the voicing quality of root-internal clusters (Table 3.54).<sup>10</sup>

Table 3.54: Voicing assimilation in underived contexts

/jek <sup>h</sup> ibdos/	/bat <sup>h</sup> k <sup>h</sup> am/	/χex <sup>t</sup> el/	/ast <sup>h</sup> χ/	/ast <sup>h</sup> vadz̃/
[jek <sup>h</sup> ib <sup>h</sup> dos]	[bat <sup>h</sup> kom]	[χex <sup>t</sup> tel]	[astχ]	[ast <sup>h</sup> ʋad̃z̃]
<ekibdos>	<badkam>	<xeydel>	<asdy>	<asdowad̃z̃>
‘Egypt’	‘message’	‘to strangle’	‘star’	‘God’
Եգիպտոս	պատգամ	խեղդել	աստղ	Աստուած

The issue of ambiguously devoiced /v/ as in ‘God’ is discussed later in Section §3.3.7.2.

Voicing assimilation is likewise a productive phonological rule. When morphology or phonology causes two obstruents to become adjacent  $C_1C_2$ , the two obstruent assimilate in voicing. If one of the obstruents is voiceless, both become

<sup>10</sup>Some speakers (Tabita Toparlak) can pronounce the word ‘star’ as [astæχ] instead of [astχ]. For such speakers, the final fricative is underlyingly /ast<sup>h</sup>ɤ/ with schwa epenthesis. But for speakers like HD who never have the fricative non-adjacent from the stop, there is never any alternations so the word is underlyingly /ast<sup>h</sup>χ/.

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voiceless. This devoicing happens either from  $C_1$  to  $C_2$  (progressive assimilation), or from  $C_2$  to  $C_1$  (regressive assimilation). We saw many instances of this in the previous sections on deaspiration. The following subsections present more data on progressive assimilation (§3.3.7.1), variable devoicing for /v/ (§3.3.7.2), regressive assimilation in intervocalic clusters (§3.3.7.3), and regressive final clusters due to -k (§3.3.7.4).

#### 3.3.7.1 Progressive assimilation in intervocalic VC(C)CV contexts

In terms of suffixation, there are few productive suffixes that start with a voiced obstruent. One such suffix is /-ban/ which is used to derive nouns that loosely have the meaning of ‘guardian or keeper of X’. This suffix starts with a voiced stop /-b/ after voiced segments.<sup>11</sup> The orthography marks this as a voiced stop պ <b> as well. But after a voiceless obstruent, this stop devoices to /-p/. More cases of devoicing were found in Table 3.55 after voiceless fricatives and obstruents which cause deaspiration and loss of prevoicing.

Table 3.55: Progressive voicing assimilation for the derivational suffix /-ban/ in VC(C)CV contexts

→ /bardez-ban/	bar'dez bardiz-'ban	‘garden’ ‘gardener’	պարտէզ պարտիզական
→ /jegeṛetsi-a-ban/	jegeṛe'tsi jegeṛets-a-'ban	‘church’ ‘church warden’	եկեղեցի եկեղեցապան
→ /hats-ban/	'hats hats-'pan	‘bread’ ‘baker’	հաց հացական
→ /baft-ban/	baft't-el baft-'pan	‘to worship’ ‘protector’	պաշտել պաշտական

Another suffix with a voiced stop is /-god/. This suffix surfaces with [g] after vowels, voiced obstruents, and sonorants. We saw this derivational suffix throughout the deaspiration sections, where it would devoice into a voiceless unaspirated [k] after voiceless obstruents. We cite additional examples in Table 3.56.<sup>12</sup>

<sup>11</sup>The vowel /-a-/ in these examples is the vowel used to connect stems to form compounds. Some suffixes also use this vowel.

<sup>12</sup>This suffix is often used after aorist stems. Most aorist stems end with /ts/, and this explains why Table 3.56 is overpopulated with /ts/ examples.



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Table 3.56: Progressive voicing assimilation for the derivational suffix /-god/ in VCCV contexts

Base		dza'ra <sup>h</sup> v	'thirsty'	ծարաւ
→	/dza <sup>h</sup> ra <sup>h</sup> v-god/	dza <sup>h</sup> ra <sup>h</sup> v-'god	'very thirsty'	ծարաւկոտ
Aorist stem		je <sup>h</sup> ra'ts-adz	'bubbled'	եռացած
→	/je <sup>h</sup> ra <sup>h</sup> ts-god/	je <sup>h</sup> ra <sup>h</sup> ts-'kod	'effervescent'	եռացկոտ
Aorist stem		p <sup>h</sup> ar <sup>h</sup> ga'ts-adz	'angry'	բարկացած
→	/p <sup>h</sup> ar <sup>h</sup> ga <sup>h</sup> ts-god/	p <sup>h</sup> ar <sup>h</sup> ga <sup>h</sup> ts-'kod	'irritable'	բարկացկոտ
Aorist stem		tsantsra <sup>h</sup> ts-adz	'bored'	ձանձրացած
→	/tsantsra <sup>h</sup> ts-god/	tsantsra <sup>h</sup> ts-'kod	'easily bored'	ձանձրացկոտ
Aorist stem		zarma <sup>h</sup> ts-adz	'surprised'	զարմացած
→	/zarma <sup>h</sup> ts-god/	zarma <sup>h</sup> ts-'kod	'easily surprised'	զարմացկոտ

This suffix is likewise found after CC-final roots (Table 3.57). Here, we see progressive assimilation happening in VCC-CV contexts. The suffix /-god/ is devoiced to [-kod] without any aspiration or prevoicing.

Table 3.57: Progressive voicing assimilation for the derivational suffix /-god/ in VCCCV contexts

→	/ba <sup>h</sup> antʃ-god/	ba <sup>h</sup> antʃ	'demand'	պահանջ
		ba <sup>h</sup> antʃ-'kod	'demanding'	պահանջկոտ
→	/p <sup>h</sup> a <sup>h</sup> tʃ-god/	p <sup>h</sup> a <sup>h</sup> tʃ-il	'to flee'	փախչիլ
		p <sup>h</sup> a <sup>h</sup> tʃ-'kod	'fugitive'	փախչկոտ
→	/na <sup>h</sup> ants-god/	na <sup>h</sup> ants	'jealousy'	նախանձ
		na <sup>h</sup> ants-'kod	'jealous'	նախանձկոտ
→	/dər <sup>h</sup> duntʃ-god/	dər <sup>h</sup> duntʃ	'grunt'	տրտունջ
		dər <sup>h</sup> duntʃ-'kod	'grunting'	տրտունջկոտ

Progressive assimilation is also found in compounds (Table 3.58). Most compounds are formed via a linking vowel /-a/. But there are cases of vowel-less or unlinked compounds where a) there is no such vowel, and b) the lack of a vowel causes the two stems to be adjacent. Here, we can find voicing assimilation as well.

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Table 3.58: Progressive voicing assimilation for the compounds without a linking vowel /VC-CV/

Bases	$\widehat{\chi atf}$ + 'gab	'cross' + 'link'	խաչ, կապ
→	$\widehat{\chi atf-kab}$	'cross piece'	խաչկապ
Bases	$\widehat{hats}$ + 'ger	'cross' + 'eat!'	հաց, կեր
→	$\widehat{hats-ke'r-ujt^h}$	'banquet'	հացկերոյթ

Another context for progressive assimilation is vowel reduction of /i,u/. For the forms in Table 3.59, the root has a final (C)CVC sequence where the final onset and coda are separated. When a suffix is added, the root's vowel is deleted, causing the consonants to assimilate.

Table 3.59: Progressive voicing assimilation from vowel reduction and syncope in /VCCV/

	$t^h a \widehat{hid_3}$	'executioner'	դահիճ
→	$t^h a \widehat{htf-a'bed}$	'chief executioner'	դահճապետ
	$sas'tig$	'intense'	սաստիկ
→	$sast.k-a'gan$	'intensive'	սաստկական
	$p^h as'tu\mathfrak{s}$	'pistachio'	փստուղ
→	$p^h ast.\chi-e'ni$	'pistachio tree'	փստղենի
	$h\mathfrak{a}n't^h ig$	'Indian'	հնդիկ
→	$h\mathfrak{a}nt.k-as'tan$	'India'	հնդկաստան
	$mar't^h ig$	'mankind'	մարդիկ
→	$mart.k-a'jin$	'human (adj)'	մարդկային
	$\widehat{ts\mathfrak{a}n tsu\mathfrak{s}}$	'bronchus'	ցնցուղ
→	$\widehat{ts\mathfrak{a}nts.\chi-a'jin}$	'bronchial'	ցնցղային
	$\widehat{tf\mathfrak{a}\chi tfig} + n\mathfrak{a}'man$	'bat' + 'like'	չղջիկ, նման
→	$\widehat{tf\mathfrak{a}\chi tfj.k-a-n\mathfrak{a}'man}$	'bat-like'	չղջկանման

#### 3.3.7.2 Variable progressive devoicing for /v/

The segment /v/ can devoice after voiceless obstruents. But there is some degree of optionality.

In some morphological contexts, a root-final /u/ becomes [v] before a vowel suffix. This [v] can then devoice after voiceless consonants (Table 3.60).

Table 3.60: Progressive voicing assimilation from /u/ frication: /VCu-V/ → //VCv-V// → [VCf-C]

	ga'du	‘cat’	կատու
→	gadv-a'gan	‘feline’	կատուական
	dira'tsu	‘clerk’	տիրացու
→	diratsf-u't <sup>h</sup> un	‘clerkship’	տիրացուութիւն
	t <sup>h</sup> ə't <sup>h</sup> u	‘sour’	թթու
→	t <sup>h</sup> ətf-e'ʁen	‘pickles’	թթուեղէն

After a voiceless sound, we transcribe /v/ as either fully devoiced [f] or as partially devoiced [ɸ]. When the fricative is part of the stressed syllable, we strongly perceive hearing a [v] sound even though the spectrogram shows little voicing on the fricative. We transcribe this situation as [ɸ]. But when the fricative is not part of the stressed syllable, the perception of a [f] is more salient to our ears.

We found similar ambiguity from vowel reduction (Table 3.61). The devoicing of /v/ seems more salient when unstressed.

Table 3.61: Progressive voicing assimilation from vowel reduction for /v/ in /VCCV/

	ha'fiv	‘account’	հաշիւ
→	ha'f <sup>v</sup> ɸ-el	‘to count’	հաշուել
→	ha'f <sup>f</sup> -abah	‘accountant’	հաշուապահ

add data from փոխադրութիւն suffix like փոխադրութիւն

We find similar ambiguity for post-voiceless [v] from the passive suffix -v- (Table 3.62). This suffix surfaces as voiced after voiced obstruents and sonorants. It is likewise written with the digraph ու that is ‘supposed’ to be pronounced as [v] before vowels.<sup>13</sup> When stressed and after a voiceless segment, we see little to no voicing on the fricative (on the spectrogram), but we strongly hear a [v] sound. When unstressed, the perception of [v] is less strong.<sup>14</sup>

<sup>13</sup>The glosses for the words in Table 3.62 is as follows. The active verbs consist of a root, theme vowel (-e-), and then an infinitive suffix -l. The passives have the passive suffix -v-, theme vowel -i-, and infinitive -l. Infinitives can get further nominal inflection like with case markers; adding case causes the theme vowel to change to -e-. See (cite chapter theme i neutralization).

<sup>14</sup>After CC clusters, the passive /-v-/ triggers schwa epenthesis: [as't-e-l] ‘to influence’ vs. [astə-'v-i-l] ‘to be influenced’. Thus voicing assimilation is blocked. See (cite chapter passive epenthesis).

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Table 3.62: Progressive voicing assimilation for passive /-v-/

	ga'b-e-l	'to connect'	կապել
→	han'-v-i-l	'to be removed'	կապուիլ
	ha'n-e-l	'to remove'	հանել
→	han'-v-i-l	'to be removed'	հանուիլ
	tʃa'p <sup>h</sup> -e-l	'to measure'	չափել
→	tʃap'-v-i-l	'to be measured'	չափուիլ
→	tʃap-f-e-l-ov	'to be removed (INS)'	չափուելով
	χa't <sup>h</sup> -e-l	'to push in'	խոթել
→	χot'-v-i-l	'to be pushed in'	խոթուիլ
→	χot-f-e-l-e	'to be pushed in (ABL)'	խոթուելէ
	tsə'k <sup>h</sup> -e-l	'to leave s.o.'	ծգել
→	tsək'-v-i-l	'to be left'	ծգուիլ
→	tsək-f-e-l-u	'to be left (GEN)'	ծգուելէ
	ə's-e-l	'to say'	ըսել
→	əs'-v-i-l	'to be said'	ըսուիլ
→	əs-f-e-l-ov	'to be said (INS)'	ըսուելով
	k <sup>h</sup> a'f-e-l	'to say'	քաջել
→	k <sup>h</sup> af'-v-i-l	'to be said'	քաջուիլ
→	k <sup>h</sup> af-f-e-l-e	'to be said (ABL)'	քաջուելէ
	tsa'χ-e-l	'to sell'	ծախել
→	tsaχ'-v-i-l	'to be sold'	ծախուիլ
→	tsaχ-f-e-l-u	'to be sold (GEN)'	ծախուելու
	k <sup>h</sup> o'ts-e-l	'to close'	զոցել
→	k <sup>h</sup> ots'-v-i-l	'to be closed'	զոցուիլ
→	k <sup>h</sup> ots-f-e-l-ov	'to be closed (INS)'	զոցուելով
	go'tf-e-l	'to close'	կոչել
→	gotf'-v-i-l	'to be closed'	կոչուիլ
→	gotf-f-e-l-e	'to be closed (ABL)'	կոչուելէ

It's possible that the the sound /v/ is gesturally pronounced at the same time as the following vowel, thus making it difficult to determine when its voicing (or lack of voicing) starts. Ideally future phonetic research can look into why we have such difficulties in determining the voicing of /v/.

It is possible that the behavior of /v/ is complicated by its articulatory behavior. Cross-linguistically, it is known that some languages have the segment /v/ undergoing voicing assimilation rules when in a pre-consontal (vC) or word-

final position (v#) The segment however resists undergoing or applying voicing assimilation in post-sonantal (Cv) contexts. Such languages include Russian, Czech, Hungarian, among others (Padgett 2002, Hall 2004, Barkai & Horvath 1978). **TODO: read Christina Bjorndahl's dissertation.** A surprising similarity is that the Armenian /v/ obligatorily undergoes regressive devoicing assimilation (as we see in the next two subsections), while progressive devoicing is variable.

### 3.3.7.3 Regressive assimilation in intervocalic VC(C)CV contexts

In [V(C)C<sub>1</sub>-C<sub>2</sub>V] we likewise find cases of regressive assimilation where a voiceless obstruent C<sub>2</sub> causes C<sub>1</sub> to devoice.

A common morphological construction that causes regressive devoicing is forming aorist stems. The roots in Table 3.63 can form inchoative verbs by adding the suffix sequence /-n-a-l/. Their aorist stems are formed by replacing the suffix /n/ with the suffix /ts/. This stem is used to form the simple past (past perfective).<sup>15</sup> The /ts/ causes the preceding obstruent to devoice.<sup>16</sup>

Table 3.63: Regressive voicing assimilation before aorist suffix /-ts-/ in VCCV contexts

Base		ʃad	‘many’	շատ
Verb		ʃad-‘n-a-l	‘to multiply (intr.)’	շատնալ
Aorist	/ʃad- <sup>ts</sup> -a-v/	ʃat- <sup>ts</sup> -a-v	‘it multiplied’	շատցալ
Base		bəzˈdig	‘small’	պզտիկ
Verb		bəzˈdig-‘n-a-l	‘to get small’	պզտիկնալ
Aorist	/bəzˈdig- <sup>ts</sup> -a-v/	bəzˈdik- <sup>ts</sup> -a-v	‘it got small’	պզտիկցալ
Base		ˈmedz	‘big’	մեծ
Verb		ˈmedz-‘n-a-l	‘to grow up’	մեծնալ
Aorist	/ˈmedz- <sup>ts</sup> -a-v/	ˈmets- <sup>ts</sup> -a-v	‘he grew up’	մեծցալ
Base		ˈsev	‘black’	սեւ
Verb		ˈsev-‘n-a-l	‘to blacken’	սեւնալ
Aorist	/ˈsev- <sup>ts</sup> -a-v/	ˈsef- <sup>ts</sup> -a-v	‘it blackened’	սեւցալ
Base		dəˈkʰeɹ	‘ugly’	տգեղ
Verb		dəˈkʰeɹ-‘n-a-l	‘to get ugly’	տգեղնալ
Aorist	/dəˈkʰeɹ- <sup>ts</sup> -a-v/	/dəˈkʰeɹ- <sup>ts</sup> -a-v	‘it got ugly’	տգեղցալ

<sup>15</sup>The full glosses are /-n-a-l/ [INCH-TH-INF], /ts-a-v/ [aor-PST-3SG.

<sup>16</sup>The sequence of [Vts-tsV] as a single segment, i.e., a geminate [tsː].

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We find the same regressive pattern before the derivational suffix /-tʰsi/ (Table 3.64). This suffix is used to create names for people from cities, countries, and ethnic groups (ethnonyms). This suffix is underlyingly just a voiceless affricate. It causes regressive devoicing on obstruents.

Table 3.64: Regressive voicing assimilation for the derivational suffix /-tʰsi/ in VCCV contexts

→ /pʰariz-tʰsi/	pʰaʹriz pʰaris-tʰsi	‘Paris’ ‘Parisian’	Պարիզ պարիզցի
→ /xarabaʰ-tʰsi/	xaraʹbaʰ xarabaʰ-tʰsi	‘Karabakh’ ‘Karabaghian’	Ղարաբաղ ղարաբաղցի
→ /halab-tʰsi/	haʹleb halep-tʰsi	‘Aleppo’ ‘Aleppoite’	Հալեպ հալեպցի

We again find regressive assimilation before the causative suffix [-tsən-] (Table 3.65).<sup>17</sup>

Table 3.65: Regressive voicing assimilation before the causative suffix /-tsən-/ in VCCV contexts

→ /gab-tsən-e-l/	gab gap-tsən-e-l	‘link’ ‘to connect (trns.)’	կապ կապցնել
→ /afχad-tsən-e-l/	afχaʹd-i-l afχat-tsən-e-l	‘to work’ ‘to employ’	աշխատիլ աշխատցնել
→ /pʰarag-tsən-e-l/	pʰaʹrag pʰarak-tsən-e-l	‘thin’ ‘to make thin’	բարակ բարակցնել
→ /tsadz-tsən-e-l/	tsadz tsats-tsən-e-l	‘low’ ‘to lower’	ցած ցածցնել
→ /tʰetʰəv-tsən-e-l/	tʰetʰəv tʰetʰəf-tsən-e-l	‘light’ ‘to lighten’	թեթեւ թեթեւցնել
→ /vaz-tsən-e-l/	vaz-e-l vas-tsən-e-l	‘to run’ ‘to hasten’	վազել վազցնել
→ /χaʰ-tsən-e-l/	χaʰ χaχ-tsən-e-l	‘game’ ‘to make to play’	խաղ խաղցնել

We’ve also found another C-initial suffix /-kʰin/ (Table 3.66). This derivational

<sup>17</sup>The gloss for /tsən-e-l/ is [CAUS-TH-INF].

suffix is rare but it can cause regressive assimilation. There are also some cases where compounds create contexts for regressive assimilation.

Table 3.66: Regressive voicing assimilation before the derivational suffix /-k<sup>h</sup>in-/ and in compounds in VCCV contexts

→	/uʒ-k <sup>h</sup> in/	'uʒ uʃ-'kin	'strength' 'strong'	նւժ նւժգին
		p <sup>h</sup> ujʒ + 'k <sup>h</sup> ujr p <sup>h</sup> uʃ-'kujr	'healing' + 'sister' 'strong'	բոյժ, քոյր բուժքոյր

There are some rare derivational prefixes that end in a voiced obstruent: synonymous [t<sup>h</sup>əʒ-] դժ and [dəʒ-] տժ (Table 3.67). The fricative surfaces as voiced before voiced segments, and devoices before voiceless obstruents. We report on just [t<sup>h</sup>əʒ-] becomes its more common in speech.<sup>18</sup>

Table 3.67: Regressive voicing assimilation after the derivational prefix [t<sup>h</sup>əʒ-] in VCCV contexts

→	/təʒ-gerb/	'gerb t <sup>h</sup> əʃ-'gerb	'form' 'ugly'	կերպ դժկերպ
		p <sup>h</sup> axt t <sup>h</sup> əʃ-'paxt	'luck' 'unlucky'	բախտ դժբախտ
→	/təʒ-k <sup>h</sup> oh/	'k <sup>h</sup> oh t <sup>h</sup> əʃ-'koh	'satisfied' 'dissatisfied'	գոհ դժգոհ
		'k <sup>h</sup> ujn t <sup>h</sup> əʃ-'kujn	'color' 'discolored'	գոյն դժգոյն

Vowel reduction can likewise create contexts for regressive assimilation. For the word in Table 3.68, the root has a final CVC syllable. When a derivational suffix is added, the root's vowel is deleted and this causes the consonants to become adjacent. Note that some of these examples include a derivational suffix /-itʃ/. Some of these examples include a devoiced /v/.

<sup>18</sup>Note that the schwa in this prefix is likely epenthetic, but we transcribe the schwa here for illustration.

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Table 3.68: Regressive voicing assimilation from vowel reduction in /VCCV/

	gə'duts + tsev	'beak' + 'shape'	կտուց, ձել
→	gə'tts-a-tsev	'beak-shaped'	կտցածել
	atʃa'gits	'assistant'	աջակից
→	atʃakts-u't <sup>h</sup> un	'assistance'	աջակցութիւն
	a'dzuχ	'coal'	ածուխ
→	atsχ-a'jin	'carbonic'	ածխային
	hamo'z-itʃ	'persuasive'	համոզիչ
→	hamos-tʃ-u't <sup>h</sup> un	'persuasion'	համոզչութիւն
	k <sup>h</sup> əra'v-itʃ	'attractive'	գրաւիչ
→	k <sup>h</sup> əraf-tʃ-u't <sup>h</sup> un	'attractiveness'	գրաւչութիւն
	[k <sup>h</sup> a'vit <sup>h</sup> ]	'courtyard'	գաւիթ
→	/k <sup>h</sup> avit <sup>h</sup> -a-bah/ [k <sup>h</sup> aft-a-bah]	with compound linker /-a-/ 'gatekeeper'	գաւթապահ

The above regressive assimilation patterns are also attested for VCCCV clusters with 3 consonants (Table 3.69). Such sequences are relatively rare but attested. We find regressive devoicing in this clusters, such as before the aorist suffix /-ts-/ or causative /-tsən-/.

Table 3.69: Regressive voicing assimilation in VCCCV contexts before aorist suffix /-ts-/ or causative /-tsən-/

Base		gərdʒ	'short'	կարճ
Verb		gərdʒ-n-a-l	'to get short'	կարճնալ
Aorist	/gərdʒ-ts-a-v/	gərtʃ-ts-a-v	'it got short'	կարճցաւ
Caus.	/gərdʒ-tsən-e-l/	gərtʃ-tsən-e-l/	'to make short'	կարճցնել
Base		ga'bujd	'blue'	կապոյտ
Verb		gabujd-n-a-l	'to become blue'	կապոյտնալ
Aorist	/gabujd-ts-a-v/	gabujt-ts-a-v	'it became blue'	կապոյտցաւ
Caus.	/gaburd-tsən-e-l/	gabujt-tsən-e-l/	'to make blue'	կապոյտցնել
Base		χo'runɡ	'deep'	խորունկ
Verb		χorunɡ-n-a-l	'to become deep'	խորունկնալ
Aorist	/χorunɡ-ts-a-v/	χorunɡk-ts-a-v	'it became deep'	խորունկցաւ
Caus.	/χorurd-tsən-e-l/	χorunɡ-tsən-e-l/	'to make deep'	խորունկցնել

Vowel reduction can likewise create VCCCV clusters with regressive assimila-



tion (Table 3.70). So far, the only examples that we've found involved the derivational suffix */-itʃ/*, whose vowel can delete and thus cause regressive assimilation.

Table 3.70: Regressive voicing assimilation from vowel reduction in */VCCCV/*

	gazmager <b>b-itʃ</b>	‘organizer’	կազմակերպիչ
→	gazmager <b>p-tʃ</b> -a'gan	‘organizational’	կազմակերպչական
	məgər <b>d-itʃ</b>	‘baptist’	մկրտիչմ
→	məgər <b>t-tʃ</b> -a'gan	‘Baptist (religion)’	մկրտչական
	ner <b>g-itʃ</b>	‘painter’	ներկիչ
→	ner <b>k-tʃ</b> -a'gan	‘fem. painter’	ներկչուհի
	p <sup>h</sup> ər <b>g-itʃ</b>	‘savior’	փրկիչ
→	p <sup>h</sup> ər <b>k-tʃ</b> -a'gan	‘pertaining to Christ’	փրկչական
	mar <b>z-itʃ</b>	‘trainer’	մարզիչ
→	mar <b>s-tʃ</b> -a'gan	‘pertaining to trainers’	մարզչական

#### 3.3.7.4 Regressive assimilation in appendix contexts: */VC(C)-k/*

Regressive assimilation happens in a word-final context for the suffix */-k<sup>h</sup>/*. As previewed in Section §3.3.6.2, this suffix can be added after any consonant cluster and cause devoicing. We go over this devoicing process as a type of regressive assimilation.

The suffix */-k<sup>h</sup>/* can be after virtually any type of consonant, even if the consonant + *k<sup>h</sup>* cannot form a complex coda based on their sonority (Table 3.71). Because of this behavior, this suffix is often phonologically analyzed as an appendix (§4.2.3). In terms of segmental phonology, this voiceless suffix triggers regressive voicing assimilation (devoicing) on any preceding obstruent. Some of these examples include a devoiced */v/*.

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Table 3.71: Regressive voicing assimilation from appendix /-k<sup>h</sup>/ reduction in /VC-k<sup>h</sup>/ sequences

	't <sup>h</sup> eb	'towards (archaic)'	դէպ
→	't <sup>h</sup> ep-k <sup>(h)</sup>	'event'	դէպք
	ha'vad	'belief (archaic)'	հաւատ
→	ha'vat-k <sup>(h)</sup>	'belief'	հաւատք
	da'radz	'spread out'	տարած
→	da'rats-k <sup>(h)</sup>	'extent'	տարածք
	'k <sup>h</sup> ov	'praise (archaic)'	գով
→	'k <sup>h</sup> of-k <sup>(h)</sup>	'praise'	գովք
	va'z-el	'race'	վազել
→	'vas-k <sup>(h)</sup>	'race'	վազք
	'goɤ	'side'	կող
→	'goɤ-k <sup>(h)</sup>	'book cover'	կողք

As discussed in Section §3.3.6.2, the level of aspiration on the final *k<sup>h</sup>* seems variable. When word-final and sentence-final, the suffix tends to resist deaspiration after fricatives. Thus we transcribe the segment as [-k<sup>(h)</sup>] for this chapter. However after stops, our recordings suggest that there's a lot less variable aspiration on the /-k<sup>h</sup>/. So a word like [t<sup>h</sup>ep-k<sup>h</sup>] 'event' could alternatively be transcribed as [t<sup>h</sup>ep-k] even in isolation. The problem is that, by being word-final, it's difficult to measure the degree of aspiration.

After a consonant cluster as well (VCC-k<sup>h</sup>), the suffix triggers devoicing (Table 3.72).

Table 3.72: Regressive voicing assimilation from appendix /-k<sup>h</sup>/ reduction in /VCC-k<sup>h</sup>/ sequences

	'bard	'debt (archaic)'	պարտ
→	'bart-k <sup>(h)</sup>	'debt'	պարտք
	'gurdz	'core of pumpkin'	կործ
→	'gurts-k <sup>(h)</sup>	'chest'	կործք
	'farɜ	'motion'	շարժ
→	'farɜ-k <sup>(h)</sup>	'motion'	շարժք

### 3.4 Place assimilation of nasals

Before the velar stops /k<sup>h</sup>, g/, the nasal /n/ becomes velar [ŋ] (Rule 3). Orthographically, the nasal is still written as a coronal nasal ն <n>. This process applies both

in underived (§3.4.1) and derived contexts (§3.4.2). In derived contexts, we can find cases where a surface [n] alternates with [ŋ]. Complications arise though from cases where /n/ has stress and can resist velarization.

**Rule 3. Nasal place assimilation before velars**

*Before a velar stop /k<sup>h</sup>, g/, the nasal /n/ becomes [ŋ].*

/ank <sup>h</sup> am/	→	[aŋk <sup>h</sup> am]	‘time’	անգամ
/tsang/	→	[tsaŋg]	‘list’	ցանկ

Nasal place assimilation does not occur before other dorsal sounds, such as before /χ, ʁ/ (§3.4.3). There is likewise no productive rule of assimilation before labials. However, labial assimilation was a widespread diachronic rule. There is likewise a degree of labial assimilation in connected speech for high-frequency words.

### 3.4.1 Velar assimilation in underived contexts

In VCCV clusters, the nasal /n/ becomes [ŋ] before the velar stops /k<sup>h</sup>, g/. Table 3.73 shows the application of this rule in roots (underived contexts).

Table 3.73: Nasal place assimilation before velar stops in VCCV contexts

/k <sup>h</sup> ank <sup>h</sup> ad/	‘complaint’	/k <sup>h</sup> ank <sup>h</sup> ur/	‘curly’	/hank <sup>h</sup> ist <sup>h</sup> /	‘comfortable’
[k <sup>h</sup> aŋk <sup>h</sup> ad]	գանգատ	[k <sup>h</sup> aŋk <sup>h</sup> ur]	գանգուր	[haŋk <sup>h</sup> ist]	հանգիստ
/əŋgujz/	‘walnut’	/hangardz/	‘suddenly’	/angoʁin/	‘bed’
[əŋgʊjz]	ընկոյզ	[haŋgʰardz]	յանկարծ	[aŋgoʰin]	անկողին

Velar place assimilation also applies in VCCCC clusters where the first two consonants are the nasal and velar (Table 3.74). Such clusters tend to be found in bound roots.

Table 3.74: Nasal place assimilation before velar stops in VCCCC (VNCCV) contexts

/ank <sup>h</sup> l-i-ja/	‘English’ (√-NMLZ)	/gank <sup>h</sup> n-i-l/	‘to stand’ (√-TH-INF)
[aŋk <sup>h</sup> liʝa]	Անգլիա	[gaŋk <sup>h</sup> nil]	կանգնիլ
/əŋgdʒ-i-l/	‘to succumb’ (√-TH-INF)	/hank <sup>h</sup> tʃ-i-l/	‘to rest’ (√-VX-TH-INF)
[əŋgʰdʒil]	ընկճիլ	[haŋktʃil]	յանգչիլ

Place assimilation also applies word-finally in VCC clusters (Table 3.75).

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Table 3.75: Nasal place assimilation before velar stops in final VCC contexts

/ʒarank <sup>h</sup> /	‘heir’	/nahank <sup>h</sup> /	‘state’	/varunk <sup>h</sup> /	‘cucumber’
[ʒaˈraŋk <sup>h</sup> ]	ժառանկ	[naˈhaŋk <sup>h</sup> ]	նահանկ	[vaˈruŋk <sup>h</sup> ]	վարունկ
/χung/	‘incense’	/vang/	‘syllable’	/anang/	‘that way’
[χuŋg]	խունկ	[ˈvaŋg]	վանկ	[aˈnaŋg]	անանկ

Although rare, there is one word which shows velar assimilation in a final VCCC cluster (Table 3.76).

Table 3.76: Nasal place assimilation before velar stops in final VCCC contexts

/ank <sup>h</sup> χ/	[ˈaŋkχ]	‘vulture’	ւնկղ
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The above examples concerned place assimilation in roots. There are likewise derivational suffixes that contain a sequence of a nasal /n/ and a velar stop: /-ank<sup>h</sup>, -unk<sup>h</sup>/. These suffixes show place assimilation: [-aŋk<sup>h</sup>, -uŋk<sup>h</sup>]. Note that many of the suffixed forms in Table 3.77 are derived from bound roots, that are often used in verbs.

Table 3.77: Nasal place assimilation before velar stops in derivational suffixes /-ank<sup>h</sup>, -unk<sup>h</sup>/

abˈr-i-l	‘to live’	√-TH-INF	ապրիլ	ḏzaɁˈr-e-l	‘to mock’	√-TH-INF	ծաղրել
abˈr-aŋk <sup>h</sup>	‘goods’	√-NMLZ	ապրանք	ḏzaɁˈr-aŋk <sup>h</sup>	‘mockery’	√-NMLZ	ծաղրանք
maɁˈz-e-l	‘to exercise’	√-TH-INF	մարզել	haɁˈk <sup>h</sup> -e-l	‘to respect’	√-TH-INF	յարգել
maɁˈz-aŋk <sup>h</sup>	‘exercise’	√-NMLZ	մարզանք	haɁˈk <sup>h</sup> -aŋk <sup>h</sup>	‘respect’	√-NMLZ	յարգանք
pəsˈχ-e-l	‘to vomit’	√-TH-INF	փսխել	iˈrav	‘truly’	√	իրաւ
pəsˈχ-uŋk <sup>h</sup>	‘vomit’	√-NMLZ	փսխունք	iɁaˈv-uŋk <sup>h</sup>	‘right (n)’	√-NMLZ	իրաւունք

Thus nasal place assimilation is productive before velar stops in underived contexts.

#### 3.4.2 Velar assimilation in derived contexts

In derived contexts, we can see roots which on their own surface with a coronal nasal [n]. When new words are derived from these roots, the nasal /n/ becomes adjacent to a velar stop /k<sup>h</sup>, g/ and it becomes [ŋ].

In terms of suffixation, the only relevant suffix is the derivational suffix /-god/ (Table 3.78). This suffix is relatively rare. We’ve found roots that end in /n/ and that take this suffix. We see nasal place assimilation.

Table 3.78: Nasal place assimilation before velar stops in suffixation

	$\widehat{\text{bardze'n-a-l}}$	‘to boast’	$\sqrt{-\text{TH-INF}}$	պարծենալ
→	$\widehat{\text{bardzen-god}}$	‘boastful’	$\sqrt{-\text{NMLZ}}$	պարծենկոտ
	$\text{'k}^{\text{h}}\text{un}$	‘sleep’	$\sqrt{\phantom{x}}$	քուն
→	$\text{k}^{\text{h}}\text{əŋ-god}$	‘sleepy’	$\sqrt{-\text{NMLZ}}$	քնկոտ

Vowel reduction creates more contexts for nasal place assimilation. For the words in Table 3.79, the base ends in a NVC sequence. Some of these bases are suffixed forms themselves. In the derived forms, the vowel is deleted, the nasal and velar stop become adjacent, and the nasal assimilates.

Table 3.79: Nasal place assimilation before velar stops from vowel reduction

	$\text{'p}^{\text{h}}\text{un}$	‘original’	$\sqrt{\phantom{x}}$	բուն
	$\text{'p}^{\text{h}}\text{ə'n-ig}$	‘native’	$\sqrt{-\text{ADJZ}}$	բնիկ
→	$\text{'p}^{\text{h}}\text{əŋ-g-a}^{\text{h}}\text{ts}^{\text{h}}\text{um}$	‘nativization’	$\sqrt{-\text{ADJZ-NMLZ}}$	բնկացում
	$\text{'f}^{\text{h}}\text{un}$	‘dog’	$\sqrt{\phantom{x}}$	շուն
	$\text{'f}^{\text{h}}\text{ə'n-ig} + \text{'tsug}$	‘puppy’ + ‘fish’	$\sqrt{-\text{DIM}}$	շնիկ, ձուկ
→	$\text{'f}^{\text{h}}\text{əŋ-g-a}^{\text{h}}\text{tsug}$	‘dog-fish’	$\sqrt{-\text{DIM-LV-}}$	շնկաձուկ
	$\text{ma'nug}$	‘child’	$\sqrt{\phantom{x}}$	մանուկ
→	$\text{maŋg-a'gan}$	‘childish’	$\sqrt{-\text{ADJZ}}$	մանկական
	$\text{jertʃa'nig}$	‘happy’	$\sqrt{\phantom{x}}$	երջանիկ
→	$\text{jertʃaŋg-a'ved}$	‘happy’	$\sqrt{-\text{ADJZ}}$	երջանկաւէտ

Place assimilation likewise applies word-finally in derived contexts. For the words in Table 3.80, the suffix  $/-k^{\text{h}}/$  is added after the nasal, causing the nasal to assimilate.

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Table 3.80: Nasal place assimilation before velar stops from the suffix /-k<sup>h</sup>/ in VC-C contexts

→	tʃa'n-a-l	'to try'	√-TH-INF	ջանալ
→	tʃaŋ-k <sup>h</sup>	'effort'	√-NMLZ	ջանք
→	gəron-aŋan	'religious'	√-ADJZ	կրօնական
→	gə'roŋ-k <sup>h</sup>	'religion'	√-NMLZ	կրօնք
→	mə'gan	'muscle'	√	մկան
→	mə'gaŋ-k <sup>h</sup>	'muscles'	√-NMLZ	մկանք
→	aɾ'zan	'cheap'	√	արժան
→	aɾ'zaŋ-k <sup>h</sup>	'worthiness'	√-NMLZ	արժանք
→	o'ren	'law (archaic)'	√	օրէնք
→	o'reŋ-k <sup>h</sup>	'law'	√-NMLZ	օրէնք

Assimilation likewise occurs when /-k<sup>h</sup>/ is added after a VCN sequence (Table 3.81).

Table 3.81: Nasal place assimilation before velar stops from the suffix /-k<sup>h</sup>/ in VCC-C contexts

→	'lajɲ	'wide'	√	լայն
→	'lajɲ-k <sup>h</sup>	'width'	√-NMLZ	լայնք
→	jer'gajɲ	'long'	√	երկայն
→	jer'gajɲ-k <sup>h</sup>	'length'	√-NMLZ	երկայնք
→	ha'majɲ	'whole'	√	համայն
→	ha'majɲ-k <sup>h</sup>	'community'	√-NMLZ	համայնք

Complications arise when place assimilation interacts with stress (Table 3.82). Armenian has primary stress on the final non-schwa vowel. There is reports of initial secondary stress but such a stress is very weak and not really perceptible. The exception is the negative prefix /an-/. This prefix takes very perceptible secondary stress. In casual speech, the nasal becomes [ɲ] before velar stops. But in careful speech, the secondary stress on /an-/ can cause the nasal to optionally surface as [an-].

Table 3.82: Variable nasal place assimilation for the prefix /an-/

→ 'ham	'taste'	համ	→ ar <sup>h</sup> ar	'just'	արդար
→ 'an-ham	'tasteless'	անհամ	→ 'an-aar <sup>h</sup> ar	'unjust'	անարդար
→ 'k <sup>h</sup> ordz	'work'	գործ	→ 'geɣdz	'false'	կեղծ
→ ,aŋ-'k <sup>h</sup> ordz	'unemployed'	անգործ	→ ,aŋ-'geɣdz	'sincere'	անկեղծ
→ 'an-'k <sup>h</sup> ordz		(careful)	→ 'an-'geɣdz		(careful)
→ k <sup>h</sup> i'dag	'wise'	գիտակ	→ gas'kadz	'doubt'	կասկած
→ ,aŋ-k <sup>h</sup> i'dag	'unknowing'	անգիտակ	→ ,aŋ-gas'kadz	'doubtless'	անկասկած
→ 'an-k <sup>h</sup> i'dag		(careful)	→ 'an-gas'kadz		(careful)
→ k <sup>h</sup> eɣe'tsig	'beautiful'	գեղեցիկ	→ gare'li	'possible'	կարելի
→ ,aŋ-k <sup>h</sup> eɣe'tsig	'ugly'	անգեղեցիկ	→ ,aŋ-gare'li	'impossible'	անկարելի
→ 'an-k <sup>h</sup> eɣe'tsig		(careful)	→ 'an-gare'li		(careful)

The above is based on HD's perception though. Experimental data is needed to accurately know the degree of velarization (or lack of velarization) of the prefix /an-/ in natural and controlled speech.

The effect of stress is stronger the words in Table 3.83. These words are compounds where the first stem ends in a nasal, and the second stem starts with a velar stop. These words are quantifier and they have irregular primary stress on the first stem. In HD's perception, the nasal is preferably [n] instead of [ŋ].

Table 3.83: Variable nasal place assimilation words with irregular stress

→ 'ajn + 'k <sup>h</sup> an		'that' + 'than'	այն, քան
→ 'ajn-'k <sup>h</sup> an	'ajŋ-'k <sup>h</sup> an	'that much'	այնքան
→ 'nujn + 'k <sup>h</sup> an		'same' + 'than'	նոյն, քան
→ 'nujn-'k <sup>h</sup> an	'nujŋ-'k <sup>h</sup> an	'as much'	նոյնքան

In sum, nasal place assimilation is productive before velar stops in derived contexts. There is some complications from stress. Stressed nasals seem to resist velarization, but more acoustic data is needed.

### 3.4.3 Other forms of nasal place assimilation

Nasal place assimilation is productive before the velar stops /k<sup>h</sup>, g/. But there is little to no evidence of productive place assimilation before other types of places, i.e., there is no assimilation before uvulars or labials.

The dorsal fricatives /χ, ʁ/ do not trigger any place assimilation (Table 3.84). The nasal /n/ surfaces as [n] before them. We haven't found relevant examples from underived contexts, but there are some cases from derived contexts.

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Table 3.84: No nasal place assimilation before dorsal uvular fricatives

	gɑ'nux	'early'	√	կանուխ
→	gɑn'χ-e-l	'to anticipate'	√-TH-INF	կանխել
	'χiɸd͡ʒ	'conscience'	√	խիղճ
→	ɑn-'χiɸd͡ʒ	'unscrupulous'	NG-√	անխիղճ
	ɤeg-ɑ-'var	'leader'	√-LV-√	ղեկավար
→	ɑn-ɤ eg-ɑ-'var	'undirected'	NG-√-LV-√	անղեկավար

Before labial stops /p<sup>h</sup>, b/, the nasal /n/ surfaces as [n] (Table 3.85). However, it is rare to find roots or underived contexts which have an underlying /np<sup>h</sup>/ or /nb/ sequence. In derived contexts, compounding and prefixation can create [np<sup>h</sup>] and [nb] sequences, without any assimilation.

Table 3.85: No synchronic nasal place assimilation before bilabial stops

	'ɑjn + 'bes	'that' + 'way'	այն, պէս
→	ɑjn-'bes	'like that'	այնպէս
	'p <sup>h</sup> ɑn + 'p <sup>h</sup> er	'word (archaic)' + 'bring!'	բան, բեր
→	p <sup>h</sup> ɑn-'p <sup>h</sup> er	'messenger'	բանբեր
	bə'dux +	'fruit'	պտուղ
→	ɑn-bə'dux	'unfruitful'	անպտուղ
	p <sup>h</sup> əna'gan +	'natural'	բնական
→	ɑn-p <sup>h</sup> əna'gan	'unnatural'	անբնական

Diachronically however, there is a process of nasal place assimilation before labials (Table 3.86). For example, there are modern words which have a [mp<sup>h</sup>] or [mb] cluster, but these cluster diachronically derived from an /n(V)p<sup>h</sup>/ or /n(V)b/ sequence.

Table 3.86: Diachronic nasal place assimilation before bilabial stops

Modern form:	d͡ʒam'p <sup>h</sup> ɑ	'road'	ճամբայ
Historical source:	d͡ʒana'p <sup>h</sup> ar	'road'	ճանապարհ (Աճառյան 1971b: 182-3)
Modern form:	amba'rift	'wicked'	ամբարիշտ
Historical source:	<anbari'd>	reconstructed	անպարիշտ (Աճառյան 1971b: 149)

Before labial nasal /m/, the nasal /n/ does not assimilate. We have not found this sequence in any underived contexts, but it is abundant in prefixation. However, there are some high-frequency words where we do find optional assimilation (Table 3.87).



### 3.5 Allophonic differences from Eastern Armenian

Table 3.87: Lack of synchronic nasal place assimilation before nasal /m/, with one exception

→	'mah ,an-'mah	'death 'deathless'	մահ անմահ	→	'majr ,an-'majr	'mother 'motherless'	մայր անմայր
→	ma'k <sup>h</sup> ur ,an-ma'k <sup>h</sup> ur	'clean 'unclean'	մաքուր անմաքուր	→	merze'li ,an-merze'li	'rejectable 'irrecusable'	մերժելի անմերժելի
~	p <sup>h</sup> an-mə p <sup>h</sup> am-mə	'a thing' (thing-INDF)	բան մը (casual speech)	~	,an-baj'man ,am-baj'man	'necessarily' (NG-√)	անպայման (casual speech)

Within the Armenian lexicon, it is rare to find /n/+labial sequences in roots, but it is quite common to find /m/+labial sequences (Table 3.88).

Table 3.88: Roots with /mp<sup>h</sup>/ or /mb/

am'p <sup>h</sup> oxtʃ	'entire'	ամբողջ	am'p <sup>h</sup> op <sup>h</sup>	'tight'	ամփոփ
'amb	'cloud'	ամպ	'χump <sup>h</sup>	'group'	խումբ

It is unclear if there is a synchronically active constraint against having /n/+labial sequences in roots in modern Armenian. Such a constraint is likely just diachronic, not synchronic. The only case where do see a synchronic alternation is in high-frequency collocation.

### 3.5 Allophonic differences from Eastern Armenian

Eastern and Western Armenian are different varieties of Armenian. The two have similar but non-identical phoneme inventories. The dialects however share a large proportion of their allophony in common. In this section, we overview allophonic processes that have been reported in Eastern Armenian and which either exist or don't exist in Western Armenian.

We likewise overview some processes which seem to apply in some varieties of Western Armenian but not others. We also note phonological processes that are optional and restricted to connect speech.

Unless otherwise specified, the Eastern examples are from English Wiktionary. The Wiktionary examples are heavily moderated and are reliable for Eastern Armenian. For transliterations, we adopt ISO 9985 to transliterate the words for Eastern Armenian,<sup>19</sup> while our own transliteration for Western Armenian.

<sup>19</sup><https://www.translitteration.com/transliteration/en/armenian-eastern-classical/iso-9985/>

### 3.5.1 Palatalization

Because of contact with Russian, Eastern Armenian has been slowly developing a rule of palatalizing dental stops to affricates before /j/: /tʰj/ → [tʰʃj]. This rule is particularly common in the nominalizing suffix /-utʰjun/ ություն which is almost always pronounced as [-utʰʃjun] in modern Eastern Armenian.

**cite vaux, and cite examples**

For Western Armenian, there is no Russian contact so on such palatalization rule exists. The closest analog is affrication of the suffix /-utʰjun/ -ութիւն. Whereas this suffix is often pronounced as [-utʰʃjun] in Eastern Armenian, this suffix is often pronounced as [-tʃyn] in Western Armenian.

Note that the suffix /-utʰjun/ shows a lot of speaker and register variation (Table 3.89). The most formal pronunciation is [-utʰyn]. But in casual speech, this suffix can variably be pronounced as [-utʰjun], [-utʰjyn], [-utʰʃjun], [-utʰʃyn], among other options. We do not know the probability or the frequency of the different pronunciations. We do not know what social factors correlate with any of these choices.

Table 3.89: Variation in the pronunciation of the nominalizer /-utjun/ suffix

Adjective:	u'raχ	'happy'	ուրախ
Nominalized	uraχ-u'tʰjun	'happiness'	ուրախութիւն
	uraχ-u'tʰjyn		
	uraχ-u'tʰyn		
	uraχ-u'tʃyn		
	uraχ-u'tʃjyn		
	uraχ-u'tʃjun		
	uraχ-u'tʃyn		

For the vowel, the original vowel sequence /ju/ is often fused into a single round vowel /y/.<sup>20</sup> This is a common process in Armenian (§3.2.3). The stop /tʰ/ often becomes [tʃ] in this context. The change from /tʰ/ to [tʃ] is unique to this morpheme and is not a language-general rule, i.e., it is a morpheme-specific rule.

### 3.5.2 Deaspiration and voicing assimilation

Western Armenian has deaspiration of stops when adjacent to a fricative, affricate, or another stop. This was surveyed in Section §3.3. But to our knowledge,

<sup>20</sup>See (Ավետյան 2015) for discussion on the diachronic changes in this suffix's pronunciation.

### 3.5 Allophonic differences from Eastern Armenian

such deaspiration does not exist in Eastern Armenian.

To illustrate, the Table 3.90 provides Western and Eastern forms. The Western forms show deaspiration of the stop, while the Eastern form does not. Note that the initial schwa in Eastern is optional.

Table 3.90: Post-fricative deaspiration in Western but not Eastern Armenian

Spelling	Western	Eastern	Meaning
սփոփել	əsp <sup>h</sup> o'p <sup>h</sup> el	(ə)sp <sup>h</sup> o'p <sup>h</sup> el	'to comfort'
սթափ	əs'tap <sup>h</sup>	(ə)s't <sup>h</sup> ap <sup>h</sup>	'sober'
սքանչելի	əskantʃe'li	(ə)sk <sup>h</sup> antʃ <sup>h</sup> e'li	'wonderful'

One possible reason as to why the dialects differ in this respect is phonemicity. Aspiration is phonemic in Eastern, but it is not in Western. Thus, there is no loss in phonemic contrasts when a Western stop is deaspirated after a fricative.<sup>21</sup>

Another apparent area of difference is voicing assimilation (Table 3.91). In obstruent clusters, both Western and Eastern Armenian are reported to have regressive assimilation in voiced+voiceless clusters (Խաչատրյան 1988: 35,100-107). But for voiceless+voiced clusters, Western Armenian has progressive assimilation (devoicing) while Eastern Armenian can keep the cluster unchanged.

Table 3.91: Dialectal differences in voicing assimilation

	Western		Eastern	
Regressive	քառ'p <sup>h</sup> աճ	'Karabagh' Ղարաբաղ	քառ'baճ	'Karabagh' Ղարաբաղ
→	քառq <sup>h</sup> աչ- <sup>h</sup> tsi	'Karabaghian' ղարաբաղցի	քառabaչ- <sup>h</sup> ts <sup>h</sup> i	'Karabaghian' ղարաբաղցի
Progressive	t <sup>h</sup> ant <sup>h</sup> aճ-'god	'slowish' դանդաղկոտ	pə'tuճ	'fruit' պտուղ
→	vaչ-'kod	'coward' վախկոտ	pə'tɕ-a-ber	'fruit-bearing' պտղաբեր

Unfortunately to our knowledge, there isn't a systematic study on productive voicing assimilation processes in Eastern Armenian. So we cannot say if Eastern Armenian truly lacks progressive assimilation.

<sup>21</sup>We thank Scott Seyfarth for discussion.

### 3.5.3 Sonorant devoicing

For Eastern Armenian, it is reported that sonorants can devoice when word-final. We have not been able to verify whether this process applies in Western or not. Our impression is that this process is a rather low-level phonetic rule, and thus not perceptible to speakers.

*cite*

Although there is voicing assimilation of obstruents in an obstruent cluster (§3.3), we also don't know if sonorants get devoiced when adjacent to a voiceless obstruent.

## 3.6 Sandhi phenomena or connected speech processes

### 3.6.1 Word-final devoicing

*mention* օգուտ մէկ տափաստ

In both Western and Eastern Armenian, voicing contrasts can be found word-finally for stops and affricates. We illustrate below with the labial series (Table 3.92).

Table 3.92: Phonemic voicing for final labials in Eastern and Western

	Eastern	Western	
թագ	't <sup>h</sup> ag	't <sup>h</sup> ak <sup>h</sup>	'crown'
թակ	't <sup>h</sup> ak	't <sup>h</sup> ag	'mallet'
թաք	't <sup>h</sup> ak <sup>h</sup>	't <sup>h</sup> ak <sup>h</sup>	'hiding'

However in both Eastern and Western Armenian, there is evidence that there is some sort of gradient devoicing process. For Eastern Armenian, there is likewise a diachronic devoicing process.

In Eastern Armenian, there are some words which are spelled with a final voiced stop/affricate, but this sound is pronounced as voiceless. We provide Western forms for completeness (Table 3.93).

### 3.6 Sandhi phenomena or connected speech processes

Table 3.93: Words in Eastern Armenian that are spelled with a final voiced stop/affricate but are pronounced as voiceless

Letter	Word	Transliteration		Pronunciation		Meaning
		EA	WA	EA	WA	
բ	Հակոբ	<Hakob>	<Hagop>	hɑ'kop <sup>h</sup>	hɑ'gop <sup>h</sup>	masc. name
գ	ծագ	<jag>	<tsak>	ˈdʒɑk <sup>h</sup>	ˈtsɑk <sup>h</sup>	‘cub’
դ	օդ	<òd>	<òt>	ˈot <sup>h</sup>	ˈot <sup>h</sup>	‘air’
ձ	օձ	<òj>	<òts>	ˈots <sup>h</sup>	ˈots	‘snake’
ջ	աջ	<aj>	<atʃ>	ˈatʃ <sup>h</sup>	ˈatʃ	‘right’

However, it is unlikely that this devoicing is due to a synchronic phonological rule (Table 3.94). For example, voiced stops and affricates can surface word-finally in some words.

Table 3.94: Words in Eastern Armenian that are spelled with a final voiced stop/affricate and are voiced in pronunciation

Letter	Word	Transliteration		Pronunciation		
		EA	WA	EA	WA	
բ	արաբ	<arab>	<arap>	a'rab	a'rap <sup>h</sup>	‘Arab’
գ	արագ	<arag>	<arak>	a'rag	a'rak <sup>h</sup>	‘fast’
դ	բադ	<bad>	<pat>	'bad	p <sup>h</sup> at <sup>h</sup>	‘duck’
ձ	նախանձ	<naxanj>	<naxants>	na'χandz	na'χants	‘jealousy’
ջ	քաջ	<k'aj>	<k'atʃ>	k <sup>h</sup> adʒ	k <sup>h</sup> atʃ	‘brave’

Furthermore, for those words which have this devoiced stop or affricate in their citation form, the sound is still pronounced as devoiced in other derived or inflected forms (Table 3.95).

Table 3.95: Inflected form of words in Eastern Armenian that are spelled with a final voiced stop/affricate but are pronounced as voiceless

Letter	Word	Transliteration		Pronunciation		Meaning
		EA	WA	EA	WA	
բ	Հակոբը	<Hakobë>	<Hagopə>	hɑ'kop <sup>h</sup> -ə	hɑ'gop <sup>h</sup> -ə	masc. name (DEF)
գ	ծագեր	<jager>	<tsaker>	dʒɑk <sup>h</sup> -er	tsɑk <sup>h</sup> -er	‘cub-PL’
դ	օդի	<òdi>	<òti>	o <sup>h</sup> -i	o <sup>h</sup> -i	‘air-GEN’
ձ	օձս	<òjs>	<òtss>	ˈots <sup>h</sup> -əs	ˈotsəs	‘snake-POSS.1SG’
ջ	աջով	<ajov>	<atʃov>	atʃ <sup>h</sup> -ov	atʃ-ov	‘right-INS’

### 3 Segmental phonology

If Eastern Armenian had true final devoicing, we would expect to see morpheme alternations where some morpheme is pronounced with a voiceless stop when said in isolation, but then pronounced with a voiced stop when suffixes are added. This does not happen.

The most likely scenario is that, again, this final devoicing rule is just an orthography-phonology mismatch which applied as a diachronic rule, not an active synchronic rule.

For Western Armenian, we don't see such an orthography-phonology mismatch. Words that are spelled with a final voiced stop are pronounced as such. However, there seems to be a gradient rule of final devoicing that varies by word, speaker, region, and by register.

For example, in HD's ideolect, certain words are prescriptively pronounced with a final voiced stop (Table 3.96). But in causal speech, the stop is optionally devoiced word-finally. Such devoicing doesn't occur when suffixes are added, making the stop intervocalic. HD self-reports that the "devoicing" can also manifest as just un-releasing the final voiced stop. We transcribe this "devoiced" or unreleased form as just a voiceless unaspirate.

Table 3.96: Words with variable final devoicing in HD's Western Armenian pronunciation

		Final voicing	Final devoicing	
Root	կապ	'gab	'gap	'connection'
→	կապեր	ga'b-er		'connection-PL'
Root	կապիկ	ga'big	ga'bik	'monkey'
→	կապիկս	ga'big-əs		'monkey-POSS.1SG'
Root	ազատ	a'zad	a'zat	'free'
→	ազատը	a'zad-ə		'free-DEF'
Root	տաբատ	da'p <sup>h</sup> ad	da'p <sup>h</sup> at	'pants'
→	տաբատով	da'p <sup>h</sup> a'd-ov		'pants-INS'
Root	շատ	'ʃad	'ʃat	'many'
→	շատեր	'ʃa'd-er		'many-PL'
Root	ծակ	'dʒag	'dʒak	'hole'
→	ծակի	dʒa'g-i		'hole-GEN'

For the Lebanese community, this devoicing process is optional and limited to a handful of high-frequency words in connected speech. For Turkish-speaking communities such as in Istanbul, TT reports that devoicing is significantly more common. HS reports significant devoicing as well, and she is a Turkish-Armenian

bilingual from Syria. Anaid Donabedian self-reports devoicing in her French community as well. For TT, HS, and Anaid Donabedian, it seems that devoicing is more frequent and more obligatory than for HD and the Lebanese community.

We cannot study in depth the rate of final devoicing. It seems that such a process is highly variable by speaker, geographic region, and by register. An ideal future research question is to examine the rate of devoicing in an oral corpus of natural speech. We speculate that devoice will vary not only by speaker, but may also show signs of incomplete devoicing or incomplete neutralization.

### 3.6.2 /h/ deletion

In modern Armenian, the orthography has a letter h for the sound /h/. There are many words which are spelled with an <h> either word-initially or word-finally. The /h/ is pronounced in careful speech. But in casual connected speech, this /h/ is optionally deleted in some words (Ղարազյուլյան 1974: 162; Մարգարյան 1997: 64).

We illustrate below with some common words which start with /h/ (2). This /h/ is pronounced in careful speech, but can optionally dropped in casual speech after a consonant or vowel. A frequent target of deletion is the classifier [had].

(2) Words which show optional /h/ deletion in connected speech

- a. jergu hazar (Careful)  
two a'zar (Casual)  
two thousand  
'two thousand.'  
երկու հազար
- b. tʃorortʰ harg-ə (Careful)  
tʃorortʰ arg-ə (Casual)  
forth floor-DEF  
'the fourth floor'  
չորրորդ յարկը
- c. meg had kʰirkʰ (Careful)  
meg ad kʰirkʰ (Casual)  
one CLF book  
'one book.'  
մէկ հատ գիրք

A frequent target of /h/ deletion is the classifier [had] (3). It follows numerals and precedes nouns. The /h/ deletes in casual speech after either a vowel or consonant.

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(3) /h/ deletion for the classifier /had/

- a. jergu **had** 'k<sup>h</sup>irk (Careful)  
jergu **ad** 'k<sup>h</sup>irk<sup>h</sup> (Casual)  
two CLF book  
'two books.'  
երկու հատ գիրք
- b. jerek<sup>h</sup> **had** 'k<sup>h</sup>irk (Careful)  
jergu **ad** 'k<sup>h</sup>irk (Casual)  
three CLF book  
'three books.'  
երեք հատ գիրք

For words with an initial <h>, the deletion seems especially common after a /r/-final word, such after some frequent possessive pronouns (4). It is likewise frequent after the word [ʃad] 'very' or 'much'.

(4) Words which show optional /h/ deletion in connected speech, especially after /r/ or dentals

- a. mer **hak**<sup>h</sup>ust-'ner-ə (Careful)  
mer **ak**<sup>h</sup>ust-'ner-ə (Casual)  
our clothing-PL-DEF  
'our clothes'  
մեր հագուստներ
- b. asor **ha**'mar (Careful)  
asor **a**'mar (Casual)  
this.GEN reason  
'for this reason'  
ասոր համար:
- c. ʃad **ha**'rust e (Careful)  
ʃad **a**'rust e (Casual)  
very rich is  
'He is very rich.'  
Շատ հարուստ է:

HD feels though that there are some /h/-initial words which resist deletion (5). These words seem to all be monosyllabic so there might be some prosodic constraint involved.

(5) Words which resist /h/ deletion in connected speech



### 3.6 Sandhi phenomena or connected speech processes

- a. mer 'hɑjɾ-ə (Careful, casual)  
our father-DEF  
'our father'  
մեր հայրը
- b. im hɑ'z-əs (Careful, casual)  
my cough-POSS.1SG  
'my cough'  
իմ հազը

For verbs with an initial /h/, the deletion seems common after the future particle [bidi], reduced as [bid] (6). In the indicative form, these verbs use the prefix [gə-] with schwa epenthesis in citation form. In connected speech, the schwa and /h/ can delete together.

(6) Inflected verbs which show /h/ deletion in casual speech

- a. bidi hɑχ't-e-ŋk<sup>h</sup> (Careful)  
bid ɑχ't-e-ŋk<sup>h</sup> (Casual)  
will win-TH-1PL  
'We will win.'  
Պիտի յաղթենք:
- b. gə-haskə-n-a-m gor (Careful)  
g-askə-nam gor (Casual)  
IND-understand-INCH-TH-1SG PROG  
'I am understanding.'  
Կը հասկնամ կոր:

For words with a final /h/, it is much rarer to find such words (7). In HD's judgments, most of these words don't show deletion in connected speech, whether intervocalically or sentence-finally.

(7) Words that don't delete final /h/ in connected speech or sentence-finally

- a. 'mah. mɑ'h-er. (Careful, casual)  
death death-PL  
'Death. The deaths.'  
Մահ: Մահեր:
- b. vəs'tah. vəs'tah e-m. (Careful, casual)  
sure Sure is-1SG  
'For sure. I am sure.'  
Վստահ: Վստահ եմ:

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For the ‘president’, the final /h/ can delete and its deleted form can affect allomorphy (8). The definite suffix is /-n/ after vowels, and /-ə/ after consonants. The deletion of the /h/ affects the choice of allomorph. The deletion and subsequent allomorphy is represented in the orthography.

(8) Words where /h/ deletion affects allomorphy

a. naχa'k<sup>h</sup>ah. naχa'k<sup>h</sup>ah-ə. (Careful)

naχa'k<sup>h</sup>a. naχa'k<sup>h</sup>a-n. (Casual)

president president-DEF

‘President. The president’

Նախագահ: Նախագահը:

Նախագա: Նախագան:

Because of how /h/ deletion applies in only some words and because of how it can feed other morphophonological rules, it is possible that /h/ deletion is actually a type of allomorphy in connected speech **find suitable kaisse citation, im thinking of an articele in the inkelas-zec book 1990.**

#### 3.6.3 Schwa vowel assimilation

The schwa /ə/ is present in Armenian words. Many of its occurrences are epenthetic. As discussed in **cite chapter schwa epenth**, consonant clusters in the orthography are broken up by schwas in pronunciation.

In careful speech, a pronounced schwa is pronounced simply as [ə]. But in casual speech, there are some words where the schwa assimilates to the vowel quality of the following vowel (Table 3.97).<sup>22</sup>

Table 3.97: Words where the schwa assimilates to the following vowel

	Careful speech	Casual speech	
գլուխ	k <sup>h</sup> ə'luχ	k <sup>h</sup> u'luχ	‘head’
դիւրիւն	t <sup>h</sup> əɾɛn	t <sup>h</sup> ɾɛn	‘easy’

One common occurrence of schwa assimilation is from the indicative prefix (Table 3.98). This prefix is /g-/ before vowels, and /gə-/ before consonants. The schwa is epenthetic (**cite chapter schwa epenthesis**). Before some /hi/-initial words, the prefix is optionally pronounced as [gi-]. The /h/ can optionally delete as well, causing the two vowels to then fuse into one vowel.

<sup>22</sup>The word ‘easy’ is prescriptively pronounced as [t<sup>h</sup>ɾɛn] in careful speech, but it’s much more common to say [t<sup>h</sup>əɾɛn] in careful speech.

### 3.6 Sandhi phenomena or connected speech processes

Table 3.98: Words where indicative prefix and /hi/-initial words fuse

Careful	gə- <b>hi</b> 'f-e-n	gə- <b>hiv</b> ant <sup>h</sup> -a-n-a-m
Casual	gi- <b>hi</b> 'f-e-n	gi- <b>hiv</b> ant <sup>h</sup> -a-n-a-m
Casual	g-i'f-e-n	g-iv <sup>h</sup> ant-a-n-a-m
	IND-remember-TH-3PL	IND-sick-LV-INCH-TH-1PL
	'They remember.'	'I become sick.'
	Կը յիշեն:	Կը հիւանդանամ:

This process of schwa vowel assimilation (vowel harmony) is limited to a handful of high-frequency words. We suspect that these alternations are just grammaticalized from some type of vowel-vowel coarticulation that occurs in casual speech. Data from oral corpora is needed in order to find out how much schwas can alternate in their vowel quality. For words other than the ones listed above, we suspect that the schwa can have its vowel quality be *gradiently* affected by neighboring vowels, not categorically.

#### 3.6.4 Schwa elision

write after done with epenthesis

talk about pokr, dakr, i did a ref from the syllable chapter. Cr meyr

#### 3.6.5 Degemination

write eventually



## 4 Syllable structure

This chapter discusses the syllable in Armenian. The first two sections give a basic overview of possible syllable types (§4.1-4.2. The remaining sections go in depth on the range of possible complex codas (§4.3.1-4.5, complex onsets (§4.6., and vowel hiatus repair or vowel-vowel sequences (§4.7). Throughout this chapter, we often give basic descriptive statistics on possible syllables from the *Kouyoumdjian* dictionary. By doing so, we give a stronger sense of what is a typical syllable vs. an atypical syllable. We likewise give a stronger sense of the range of attested or unattested syllables in Armenian.

### 4.1 Overview of syllable structure

In terms of syllable structure, Armenian in *general* uses a maximal CVCC template. This means that a syllable can consist of a simple onset, or no onset. The syllable can have a coda, a complex coda, or no coda. Table 4.1 illustrates the basic types of syllables. Throughout this overview section, we provide a count of such syllable types among monosyllabic words in *Kouyoumdjian* (1970)’s dictionary.

Table 4.1: Basic syllable types and their distribution in monosyllables

Onset	CV	p <sup>h</sup> u	‘owl’	բու	n=32
	CVC	p <sup>h</sup> an	‘thing’	բան	n=1099
	CVCC	part <sup>h</sup>	‘complex’	բարդ	n=695
	V	u	‘and’	ու	n=7
	VC	աք	‘salt’	աղ	n=53
	VCC	աքd	‘stain’	աղս	n=67
Total					1953

Virtually any consonant can act as an onset or coda. To illustrate, the tables in Section §3.1 showed how each consonant can be found word-initially or word-finally. Virtually any vowel can be found in any type of syllable. For the core vowels /a, e, i, o, u/, see Table 3.16; for the schwa see 3.19. For /y/, it can be found

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with or without a coda, but it is very rare to find a /x/ without an onset (Section §3.2.3).

In terms of word size, there is no minimal syllable size for a word. That is, a word can be just a single syllable vowel V, a single open syllable CV. But as shown by the descriptive statistics in Table 4.1, it is very rare to find words monosyllabic words which lack a coda (V, CV). Among monosyllables, it's more common to find words with codas.

There is no limit on how big a word can be. See Section §5.1.1 for examples of stress shift applying in very large words. Words can get larger whether by compounding, adding derivational suffixes, or by adding inflectional suffixes.

Within polysyllabic words, virtually any type of syllable can be found in any position (Table 4.2). That is, an open CV, closed CVC, or closed CVCC syllable can be found word-initially, word-medially, or word-finally.

Table 4.2: Different syllable shapes in different word positions

CV	Word-initial 'p <sup>h</sup> a.'ri 'good' բարի	Word-medial hax.ta.'gan 'triumphal' յաղթական	Word-final tsə.'ri 'free' ծրի
CVC	'k <sup>h</sup> ul.'ba 'sock' զուկայ	dʒəf.mar.'del 'to verify' ճշմարտել	hajd.'nel 'to reveal' յայտնել
CVCC	'k <sup>h</sup> extʃ̣.ka.'jin 'boorish' գեղջկային	əs.kəsp.na.'gan 'original' սկզբնական	max.'tan <sup>h</sup> k 'wish' մաղթանք

There are some possible asymmetries in forming word-medial complex codas, discussed in Section §4.5.2.

For onsetless syllables like V(C)(C), such syllables are generally restricted to the word-initial position (Table 4.3). Word-medially, such onsetless syllables are quite restricted. They can be found across a compound a prefixoid boundary /a/ in some words, and often in loanwords. But in this case, there is a slight glottal stop before the V(C)(C) syllable. The glottal stop isn't marked in the traditional transcriptions in Armenian philology or dialectology.

Table 4.3: Onsetless syllables in different word positions

V	Word-initial u.'zɛɤ 'strong' ուժեղ	Not word-initial a.me.n-a-ʔu.'rɑχ 'happiest' ամենաուրախ
VC	if.'χun 'rhubarb' իջխուն	t <sup>h</sup> a.t <sup>h</sup> e.ʔos 'Thaddeus' Թադէոս
VCC	ənt <sup>h</sup> .lɑj.'nel 'to enlarge' ընդլայնել	i.mas.t-a-ʔix <sup>ts</sup> 'sensible' իմաստալիճ

Further description of these word-medial onset-less syllables is discussed in the section on vowel hiatus repair (§4.7), especially for loanword roots (§4.7.1) and prefixoids (§4.7.3.2).

## 4.2 Consonant clusters in the syllable

As said, the general template syllables is CVCC. Complex onsets are generally banned (4.2.1), while complex codas are generally at most two consonants with falling sonority (§4.2.2). Flat sonority clusters can be created via extrasyllabic appendixes (§4.2.3). Final clusters of 3 consonants are exceedingly rare (§4.2.4.

The survey in this section gives a very basic idea of the possible syllable in Armenian. For more in-depth coverage, Sections §4.3 and §4.4 catalog every types of word-final consonant cluster that we could find in the *Kouyoumdjian* dictionary.

### 4.2.1 Complex onsets are generally banned

For complex onsets, they are virtually banned. The main exception is consonant-glide sequences (Table 4.4; §4.6.1). Word-initially, these sequences are rather rare though and limited to [Cja...] sequences (orthographically as Ctւ sequences). We only found 10 monosyllabic words with initial Cj sequences from the *Kouyoumdjian* (1970) dictionary; and most of these were archaic words.

Table 4.4: Consonant-glide sequences as complex onsets in monosyllables

<leart>	[ljart <sup>h</sup> ]	'liver'	լեարդ
<geank'>	[gjan <sup>h</sup> k <sup>h</sup> ]	'life'	կեանք

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Some more cases are found for words which are prescriptively pronounced with a round vowel /y/ like [kʰʏʁ] ‘village’ գիւղ (orthographic <Ciw>sequences), but which can optionally be pronounced as [ju] in colloquial Western: [kʰjuʁ]. See Section §3.2.3 for more data on these round vowels. Eastern Armenian systematically pronounces such words with [ju] instead of [y], thus having more cases of word-initial CjV sequences.

For other restrictions on complex onsets, see Section §4.6.

### 4.2.2 Overview of complex codas

Orthographically, Armenian has many words that are written with two final consonants (Table 4.5). Their syllabification is surveyed in depth in Section §4.3. Some of these clusters are pronounced as just a complex coda. These clusters tend to have falling-sonority: [barz] ‘simple’. Obstruent complex codas are always homogeneous in voicing (§3.3.7. Very rarely, we find words that end in two identical consonants, and this cluster is pronounced as a geminate or single long consonant: [darr] ‘element’. But there are orthographic clusters which falling-sonority clusters, but which usually take schwa epenthesis: [χarən] ‘mixed’. As for clusters with flat or rising sonority, some take schwa epenthesis, while some can form consonant clusters without epenthesis.

Table 4.5: Pronunciation of final CC clusters in monosyllables

Sonority	Surface shape					#
Falling	CVCC	<barz>	[barz]	‘simple’	պարզ	n=697
	CjVCC	<neart>	[njartʰ]	‘fiber’	նեարդ	n=4
	VCC	<azt>	[ast]	‘notice’	ազդ	n=67
Falling	CVCəC	<xarən>	[χarən]	‘mixed’	խառն	n=20
	VCəC	<arən>	[arən]	‘wild sheep’	առն	n=5
Geminate	CGCG	<darr>	[darr]	‘element’	տարր	n=3
Flat	CVCəC	<ews>	[jevəs]	‘morever’	եւս	n=6
	VCəC	<inn>	[inən]	‘nine’	ինն	n=3
Rising	CVCəC	<dzanr>	[dzanər]	‘heavy’	ծանր	n=81
	VCəC	<agn>	[aɡən]	‘eye’	ակն	n=10

Besides the above cat orgies of complex codas, there are some arbitrary restrictions on word-medial complex codas and some vowel-coda dependencies. These miscellaneous restrictions are covered in Section §4.5. Schwa epenthesis is likewise a quite complicated morphophonological process, briefly overviewed in Section §3.2.2 and discussed in depth in [cite epenthesis chapter](#).



### 4.2.3 Appendix or extrasyllabic consonants

For those flat or rising-sonority clusters which don't take schwa epenthesis, the final consonant is often analyzed as some type of extrasyllabic appendix (Table 4.6). The final segment is one of the following segments /k<sup>h</sup>, m, χ, s, f/.

Table 4.6: Monosyllabic words with appendixes

Appendix	Shape				#
-k <sup>h</sup>	CVck <sup>h</sup>	lit <sup>h</sup> sk <sup>h</sup>	'stuffing'	լիցք	n=41
	Vck <sup>h</sup>	at <sup>h</sup> ʃk	'eye'	աչք	n=3
	CjVck <sup>h</sup>	sja <sup>h</sup> mk <sup>h</sup>	'threshold'	սեւաք	n=1
-m	CVCm	go <sup>h</sup> ɤm	'side'	կողմ	n=18
	VCm	a <sup>h</sup> ʃm	'jade'	աշմ	n=1
-χ	CVCχ	va <sup>h</sup> ʃχ	'usury'	վաշխ	n=11
	VCχ	a <sup>h</sup> χχ	'baggage'	աղի	2=n
-s	CVCs	dza <sup>h</sup> χs	'expense'	ծախս	n=13
-f	CVCf	dʒa <sup>h</sup> ff	'breast-plate'	նաւ	n=1

The appendix /m/ is quite common after fricatives (§4.3.3.10), while the fricative appendixes are mostly found after other fricatives (§4.3.3.9). Some of these fricatives can also follow stops (§4.3.3.2) and complex codas (§4.4.2).

Among these appendixes, the nominalizer suffix -k<sup>h</sup> ք is special in how its consistently violates all syllable rules. It can follow any type of consonant or consonant cluster, including laterals (§4.3.2.8), stops, (§4.3.3.1), affricates (§4.3.3.6), and complex codas (§4.4.2.1). Diachronically, this suffix -k<sup>h</sup> was a plural suffix in Classical Armenian, and thus it was freely added after words. In the modern language, this inflectional suffix was reanalyzed as a derivational suffix, and it developed special behaviors in terms of syllabification. It can form a complex coda that are otherwise found in the language, such as *r*-k<sup>h</sup>, but it can also form consonant clusters that are otherwise absent. Though there are some restrictions on word-medial appendixes (4.5.2.5).

Because of this special behavior, the suffix -k<sup>h</sup> is often analyzed as not actually being part of the syllable. It is instead an extrasyllabic appendix, i.e., a segment that is added after any syllable (Vaux 1998: 83-4; Vaux & Wolfe 2009).. Representation 1 illustrates.

**Representation 1.** Syllable structure of a complex coda vs. coda + appendix

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Complex coda in [barz] ‘simple’ պարզ	Coda + appendix in [litsk] ‘stuffing’ լիցք
<p>Word</p> <p>└─ Syllable</p> <p>    └─ Rime</p> <p>        └─ Coda</p> <p>            └─ z</p> <p>            └─ r</p> <p>        └─ Nucleus</p> <p>            └─ a</p> <p>    └─ Onset</p> <p>        └─ b</p>	<p>Word</p> <p>└─ Syllable</p> <p>    └─ Rime</p> <p>        └─ Coda</p> <p>            └─ ts</p> <p>            └─ i</p> <p>        └─ Nucleus</p> <p>            └─ l</p> <p>    └─ Onset</p> <p>        └─ k</p>

Note that in Representation 1, we show the  $-k^h$  as attached directly to the word, and not to the Coda node. But it's possible that the appendix is actually added to the Syllable node instead. Crucially, the  $-k^h$  must be present somewhere within the phonological structure, so that it can trigger allophonic processes such as voicing assimilation (§3.3.6.2, 3.3.7.4), cf. voicing assimilation in Polish appendixes: Rubach & Booij 1990, Rubach 1996, 1997). In fact, Dolatian () argues that this segment is attached to a prosodic constituent that's that is below the prosodic word, specifically the prosodic stem (Downing 1999). [vaux and dolatian citation page](#).

#### 4.2.4 Maximality of complex codas

For complex codas, these are usually at most 2 consonants. If the orthography has a final 3-consonant cluster (Table 4.7; §4.4), this cluster is pronounced with either schwa epenthesis or with an appendix such as  $/-k^h, \chi/$ . Kouyoumdjian (1970) lists only one word [verst] (a loanword from Russian) with a final 3-consonant cluster which a) we pronounce without epenthesis and which b) doesn't have an appendix.

### 4.3 Syllabification of final two-consonant clusters

Table 4.7: Words with final 3-consonant clusters

Sonority	Shape					#
Falling	CVCəCC	<xaɾnk’>	[χaɾəŋk <sup>h</sup> ]	‘copulation’	խառնք	n=1
Rising	CVCCəC	<partsr>	[p <sup>h</sup> artsəɾ]	‘high’	բարձր	n=34
	VCCəC	<ajzm>	[ajzəm]	‘now’	այժմ	n=25
Flat	CVCCəC	<tfermn>	[tfermən]	‘fever’	ջերմս	n=3
Falling	CVCCk <sup>h</sup>	<dʒajrk’>	[dʒajrk <sup>h</sup> ]	‘extremity’	ծայրք	n=11
	VCCk <sup>h</sup>	<uyxk’>	[uχχk <sup>h</sup> ]	‘torrent’	ուղխք	n=2
Flat	CVCCk	<gurdzk’>	[gurtsk <sup>h</sup> ]	‘breast’	կուրծք	n=19
	VCCk <sup>h</sup>	<ants’k’>	[antsk <sup>h</sup> ]	‘passage’	անցք	n=7
Rising	VCCχ	<asdy>	[astχ]	‘star’	աստղ	n=1
Falling	CVCCC	<versd>	[verst]	‘verst’	վերստ	n=1

For those clusters that use schwa epenthesis, the final consonant is almost always a sonorant or fricative. The preceding cluster almost always have falling sonority. These restrictions are because of diachrony. **cite vaux** It has been posulated that in earlier stages of the language (Classical Armenian and Proto-Armenian), the ancestor of these <VCCC> [VCCəC] words would have an extra final syllable (perhaps <VCCCV> or <VCCVC>). Over time, the final syllable was lost, and the loss of a syllable required schwa epenthesis.

### 4.3 Syllabification of final two-consonant clusters

This section goes through all attested and un-attested complex codas in Western Armenian. To find the attested clusters, we went through the **Kouyoumdjian** dictionary and kept track of all words that were written with two final consonants. We catalogued the consonants in terms of their sonority and pronunciation.

For sonority, we use the conventional sonority scale of *stop/affricate* < *fricative* < *nasal* < *liquid* < *glide* < *vowel*.

In Section §4.3.1, we go through word-final consonant clusters that had falling sonority, formed a complex coda in pronunciation, and were very common in the dictionary, such as fricative-stop clusters like [ɑxp] ‘trash’ աղք. In contrast, Section §4.3.2 goes through clusters that had falling sonority but had some exceptional behavior. Such exceptional behavior is one of the following:

- The orthographic cluster is pronounced as a complex coda but is very rare or restricted to loanwords like the lateral-fricative cluster in [vɑls] ‘waltz’ վալս. This category includes clusters that are simply unattested in either **Kouyoumdjian** or other sources like Wiktionary.

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- The orthographic cluster requires an intervening schwa, either always or optionally like rhotic-/n/ clusters in [χar(ə)n] ‘mixed’ ʃuwn.
- The orthographic cluster is pronounced without a schwa but the second consonant was almost always a certain segment, suggesting that this segment is an extrasyllabic appendix, such as lateral-/k<sup>h</sup>/ clusters like [χelk<sup>h</sup>] ‘mind’ ʃutɬp.

The dictionary likewise listed many words that end in a two-consonant cluster with either flat or rising sonority (§4.3.3. Here, we find the same types of exceptional behavior: rarity vs. epenthesis vs. appendixes. Gemination was vanishingly rare as well (§4.3.4.

Because the data is quite complicated, we’ve had difficulty provided succinct summaries over the possible complex codas. Instead, each subsection has a list of what natural classes of clusters pattern together in terms of their syllabification.

### 4.3.1 Falling-sonority and common complex codas

The majority of common complex codas were falling sonority and belonged to one of the following groups based on the identity of the first and second consonant (C1, C2):

- Fricative /s,ʃ/ + stop (§4.3.2.1
- Fricative /χ,ʁ/ + stop or affricate (§4.3.1.2
- Nasal /m/ + labial stop (§4.3.1.3
- Nasal /n/ + stop or affricate (§4.3.1.4
- Rhotic /r/ + obstruent (§4.3.1.5
- Glide /j/ + consonant (§4.3.1.7

#### 4.3.1.1 Fricative /s,ʃ/ + stop

The fricatives /s,ʃ/ can form complex codas with voiceless stops [p, t, k] with stop deaspiration. The most common stop is coronal [t]. The fricatives however cannot form complex codas with voiced obstruents, in order to avoid a voicing mismatch (§2.4.2, §3.3.7). The fricative /s,ʃ/ also avoid combining with affricates (§4.3.2.2).

The fricative /s/ is a pretty common segment. It can form complex codas with any type of voiceless stop: [sp, st, sk] (Table 4.8). Note the deaspiration on the stop. The [k] can be part of either the root (written as q,ʎ) or part of the nominalizer suffix -k<sup>h</sup> (written as p).

### 4.3 Syllabification of final two-consonant clusters

Table 4.8: Complex codas where C1 is fricative /s/, and C2 is a voiceless stop

[sp]	'vos <b>p</b> ba'ris <b>p</b>	'lentil' 'fortress'	նսպ պարիսպ	n=24
[st]	p <sup>h</sup> ust nə'bast	'coral' 'subsidy'	բուստ նպաստ	n=287
[sk]	'gask bə'risk	'malt' 'drias plant'	կասկ պրիսկ	n=26
[s-k]	k <sup>h</sup> es-k k <sup>h</sup> es	'head of hair' (√-NMLZ) 'long hanging hair'	գէսք գէս	n=14

Similarly, the fricative /ʃ/ can form a complex coda with a voiceless stop [ʃp, ʃt, ʃk] (Table 4.9). The [k] can be part of the root (written as գ,կ) or part of the nominalizer suffix -k<sup>h</sup> (written as ք).

Table 4.9: Complex codas where C1 is fricative /ʃ/, and C2 is a voiceless stop

[ʃp]	k <sup>h</sup> u <b>ʃp</b>	'crevice'	գուշպ	n=1
[ʃt]	'ge <b>ʃt</b> p <sup>h</sup> e'he <b>ʃt</b>	'sect' 'paradise'	կեշտ բեհեշտ	n=178
[ʃk]	'ma <b>ʃk</b> t <sup>h</sup> ə'mi <b>ʃk</b>	'cuticle' 'Damascus blade'	մաշկ դմիշկ	n=47
[ʃ-k]	'dʒo <b>ʃ</b> -k cf. dʒo'ʃ-a-l	'defamation' (√-NMLZ) 'to defame' (√-TH-INF)	ճօշք ճօշակ	n=4

#### 4.3.1.2 Fricative /χ, ʁ/ + stop or affricate

The fricative /χ/ can form a complex coda with any voiceless stop or affricate, with deaspiration on the stop: [χp, χt, χk, χts, χtʃ] (Table 4.10). Though the most common complex coda involves [t]. The [k] can be part of either the root (written as q) or part of the nominalizer suffix -k<sup>h</sup> (written as ք).

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Table 4.10: Complex codas where C1 is fricative /χ/, and C2 is a voiceless stop or affricate

[χp]	'fexp 'p <sup>h</sup> αxp	'blade' 'sheen'	շերբ փաղփ	n=19
[χt]	'saxt t <sup>h</sup> ə'raxt	'saddle' 'paradise'	սախտ դրախտ	2n=19
[χk]	'hexk	'lazy'	հեղգ	n=1
[χ-k]	ha'dʒαχ-k cf. ha'dʒα'χ-e-l	'frequency' (√-NMLZ) 'to frequent' (√-TH-INF)	յաճախք	n=45
[χts]	't <sup>h</sup> ex <sup>h</sup> ts α'daχts	'peach' 'timber'	դեղծ ատաղծ	n= 53
[χtʃ]	'zeχtʃ 'k <sup>h</sup> αχtʃ	'discount' 'lukewarm'	զեղչ գաղջ	n=26

The fricative /ɸ/ is generally infrequent as a segment. But it can form complex codas with voiced stops and affricates (Table 4.11). It cannot co-occur with voiceless obstruents. Any orthographic sequences of <y> and a voiceless obstruent are pronounced as voiceless (§2.4.2).

Table 4.11: Complex codas where C1 is fricative /ɸ/, and C2 is a voiced stop or affricate

[ɸb]	'dʒαɸb	'coffin'	ջաղպ	n=1
[ɸd]	'geɸd 'uɸd	'stain' 'camel'	կեղտ ուղտ	n=21
[ɸg]	'meɸg mə'ʒuɸg	'soft' 'gnat'	մեղկ մժուղկ	n=21
[ɸdz]	'meɸdz 'zeɸdz	'soot' 'dissolute'	մեղծ զեղծ	n=37
[ɸdʒ]	'χiɸdʒ 'χeɸdʒ	'conscience' 'wretched'	խիղճ խեղճ	n=4

##### 4.3.1.3 Nasal /m/ + labial stop

The nasal /m/ can precede labial stops /p<sup>h</sup>, b/ (Table 4.12). The cluster [mp<sup>h</sup>] is significantly more common than [mb]. However, /m/ seems to avoid forming a complex coda with other types of stop. A spurious exception is *mk<sup>h</sup>* sequences which utilize an appendix. See Section §4.3.2.5.

### 4.3 Syllabification of final two-consonant clusters

Table 4.12: Complex codas where C1 is nasal /m/, and C2 is a labial stop

[mp <sup>h</sup> ]	ճձձձ <sup>h</sup> mp <sup>h</sup>	‘sulfur’	ծծոմբ	n=180
	ցա՛ռ <sup>h</sup> amp <sup>h</sup>	‘cabbage’	կաղամբ	
[mb]	‘amb	‘cloud’	ամայ	n=6
	‘umb	‘gulp’	ումայ	

The preponderance of [mp<sup>h</sup>] over [mb] is typologically surprising (Pater 1999) but it makes diachronic sense (Beguš 2019). Most surface [mp<sup>h</sup>] clusters are written with final <mp> մբ. This sequence corresponds to Classical/Eastern Armenian [mb] clusters. In contrast, Western [mb] clusters are orthographically <mb> մւ, and they correspond to Classical/Eastern [mp]. The sound changes  $p \rightarrow b$  and  $b \rightarrow p^h$  caused Western Armenian to end up having [mp<sup>h</sup>] be more common than [mb].

#### 4.3.1.4 Nasal /n/ + stop or affricate

The nasal /n/ can form a complex coda with coronal /t<sup>h</sup>/ or /d/ (Table 4.13).

Table 4.13: Complex codas where C1 is nasal /n/, and C2 is a coronal stop

[nt <sup>h</sup> ]	ճա՛ռ <sup>h</sup> ant <sup>h</sup>	‘talent’	տաղանդ	n=295
	ա՛տ <sup>h</sup> a՛mant <sup>h</sup>	‘diamond’	աղամանդ	
[nd]	‘xand	‘lewd’	խանտ	n=32
	‘zand	‘pestilent’	ժանտ	

There are no examples of /n/ + a labial stop /p<sup>h</sup>, b/. It’s unclear if this is an accidental gap, or if there’s an active constraint against having /np<sup>h</sup>, nb/ complex codas. Such clusters can arise across difference syllables however (§3.4.3).

The nasal /n/ can appear before velar /k<sup>h</sup>, g/ (Table 4.14). In this situation, the nasal becomes a velar [ŋ] (§3.4). Note that the /k<sup>h</sup>/ can be part of the same root as the nasal (written as q). The nasal+stop can also be part of common nominalizer suffixes /-ank<sup>h</sup>, -unk<sup>h</sup>, -(a)munk<sup>h</sup>/. The stop can also be part of a separate nominalizer suffix /-k<sup>h</sup>/. For all these latter cases, the stop is written as ք.

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Table 4.14: Complex codas where C1 is nasal /n/, and C2 is a velar stop

/ng/	tsaŋg gə'ruŋg	'list' 'heel'	ցանկ կրունկ	n=203
/nk <sup>h</sup> / root	'ruŋk <sup>h</sup> və'daŋk <sup>h</sup>	'nostril' 'danger'	ռունգ վտանգ	n=115
/n-k <sup>h</sup> /	'vaŋ-k <sup>h</sup> cf. van-a'gan	'convent' (√-NMLZ) 'monastic' (√-ADJZ)	վանք վանական	n=759
/-ank <sup>h</sup> /	ɑfχa'd-aŋk <sup>h</sup> cf. ɑfχa'd-i-l	'work' (√-NMLZ) 'to work' (√-TH-INF)	աշխատանք աշխատիլ	
/-unk <sup>h</sup> /	həraʃ-uŋk <sup>h</sup> cf. həraʃ-k	'miracle' (√-NMLZ) 'miracle' (√-NMLZ)	հրաշունք հրաշք	
/-(a)munk <sup>h</sup> /	baʃt-amuŋk <sup>h</sup> cf. baʃt-e-l	'ceremony' (√-NMLZ) 'to worship' (√-TH-INF)	պաշտամունք պաշտել	

The nasal /n/ can precede any affricate /ts, dz, tʃ, dʒ/ (Table 4.15).

Table 4.15: Complex codas where C1 is nasal /n/, and C2 is an affricate

[nts]	'dants bə'ɪnts	'pear' 'copper'	տանձ պղինձ	n=134
[ndʒ]	'χandʒ go'ɛundʒ	'bait' 'hard crust'	խանձ կողունձ	n=25
[ntʃ]	'mantʃ a'gantʃ	'lad' 'ear'	մանչ ականջ	n= 222
[ndʒ]	'dʒandʒ je'kindʒ	'fly' 'large nettle'	ճանճ եղինճ	n=56

##### 4.3.1.5 Rhotic /r/ + obstruent

The rhotic /r/ can form a complex coda with a) any obstruent, and b) with /m/. The nasal /n/ however has complications in syllabification; postponed to Section §4.3.2.7.

The rhotic /r/ can form a complex coda with any type of stop: /p<sup>h</sup>, b, t<sup>h</sup>, d, k<sup>h</sup>, g/ (Table 4.16). For /k<sup>h</sup>/, the stop can either be part of the root (written as q) or arguably be the nominalizer suffix -k<sup>h</sup> (written as -p).



### 4.3 Syllabification of final two-consonant clusters

Table 4.16: Complex codas where C1 is rhotic /r/, and C2 is a stop

[rp <sup>h</sup> ]	'arp <sup>h</sup> 'surp <sup>h</sup>	'sunlight' 'holy'	արփ սուրբ	n=42
[rb]	'dʒarb 'dzerb	'grease' 'crevice'	ճարպ ծերպ	n=216
[rt <sup>h</sup> ]	'vart <sup>h</sup> zə'vart <sup>h</sup>	'rose' 'joyous'	վարդ զուարթ	n=574
[rd]	'k <sup>h</sup> ord hə'bard	'frog' 'proud'	գորտ հպարտ	n=298
[rk <sup>h</sup> ]	'hark <sup>h</sup> 'gark <sup>h</sup>	'esteem' 'order'	յարգ կարգ	n=106
[r-k <sup>h</sup> ]	'p <sup>h</sup> ar-k <sup>h</sup> cf. p <sup>h</sup> ar-a-zart <sup>h</sup>	'glory' (√-NMLZ) 'glorious' (√-LV-√)	փառք փառազարդ	n=2756
[rg]	'nerg ɑ'dzarg	'paint' 'switch'	ներկ ածարկ	n=187

The rhotic /r/ can be appear before any affricate /ts, dz, tʃ, dʒ/ (Table 4.17).

Table 4.17: Complex codas where C1 is rhotic /r/, and C2 is an affricate

[rts]	'harts χo'lorts	'issue' 'orchid'	հարց խլիործ	n=187
[rdz]	'vordz lə'birdz	'belch' 'slippery'	ործ լպիրծ	n=342
[rtʃ]	'artʃ ha'kartʃ	'bear' 'currant'	արջ հաղարջ	n=42
[rdʒ]	'gordʒ zə'vardʒ	'griffin' 'joyfully'	կորճ զուարճ	n=37

The rhotic can appear before the fricatives /s, z, ʃ, ʒ, χ/ (Table 4.18). Complications arise for the other fricatives.

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Table 4.18: Complex codas where C1 is rhotic /r/, and C2 is a fricative

[rs]	'hars a'kars	'bride' 'supplication'	հարս աղէրս	n=38
[rz]	'marz 'barz	'confine' 'simple'	մարզ պարզ	n=14
[rf]	'k'orɟ ɟə'kɑɟ	'gray' 'gauze'	գորշ շղարշ	n=44
[rʒ]	'varʒ a'χorʒ	'accustomed' 'pleasant'	վարժ ախորժ	n=85
[rχ]	't'arχ 'χorχ	'sketch' 'hide'	թարխ խորխ	n=4

The **Kouyoumdjian** dictionary does have any words with final /rf, rv, rɸ/. For /rf, rv/, this is likely because these fricatives are quite rare in the first place. On Armenian Wiktionary, we've found a handful of words with final /rf, rv/. These all seem to be loanwords: [alomorɸ] 'allomorph' ալոմորֆ, [nerv] 'nerve' ներվ. For /rɸ/, the handful of Wiktionary examples seem to be dialectal words that are absent from Western Armenian.

Orthographically, the rhotic can form a cluster with the fricative /h/, whether as nh or ph (Table 4.19). However, most words that have this final cluster don't pronounce the /h/, such that the [rh] pronunciation is archaic or obsolete. Only a subset of these words have the final /h/ still pronounced, thus creating a [rh] complex coda. See Section §2.4.4 for general data on this orthography-phonology mismatch.

Table 4.19: Complex codas where C1 is rhotic /r/, and C2 is a fricative /h/

Silent <h>	aɟ'χar	'world'	աշխարհ	n=38
	χo'nar	'humble'	խոնարհ	
Pronounced <h>	'χorh	'thought'	խորհ	n=8
	ʒə'birh	'insolent'	ժպիրհ	

##### 4.3.1.6 Rhotic /r/ + nasal /m/

Orthographically, there are many words that end in a rhotic /r/ + nasal /m/. These clusters are pronounced as [rm] without schwa epenthesis (Table 4.20).

### 4.3 Syllabification of final two-consonant clusters

Table 4.20: Complex codas where C1 is rhotic /r/, and C2 is a nasal /m/

[rm]	'zarm	'tribe'	զարմ	n=100
	'tʃerm	'warm'	ջերմ	
	'arm	'stamp'	արմ	
	vo'xorm	'pity'	ողորմ	

Word-medially however, the [rm] complex coda shows some idiosyncrasies (§4.5.2.1).

#### 4.3.1.7 Glide /j/ + consonant

The glide /j/ can form a complex coda with virtually any type of consonant. Though there are some accidental gaps in the *Kouyoumdjian* dictionary.

As a C1, the glide /j/ can precede virtually any type of stop, whether voiced or voiceless (Table 4.21). For final [jk<sup>h</sup>], the final /k<sup>h</sup>/ can either be part of the same morpheme as the glide (written as jq), or part of a separate nominalizer suffix -k<sup>h</sup> (written as jp) .

Table 4.21: Complex codas where C1 is glide /j/, and C2 is a stop

[jt <sup>h</sup> ]	'xajt <sup>h</sup> məʃɑ'gujt <sup>h</sup>	'sting' 'culture'	խայթ մշակոյթ	n=95
[jd]	'ajd bə'dujd	'cheek' 'tour'	այտ պտոյտ	n=151
/jk <sup>h</sup> /	'ajk <sup>h</sup> 'zujk <sup>h</sup>	'dawn' 'twin'	այգ զոյգ	n=26
/j-k <sup>h</sup> /	'gajk <sup>h</sup> cf. 'gaj hə'majk <sup>h</sup> cf. həmə'j-e-l	'station' 'station' 'charm' 'to charm'	կայք կայ հմայք հմայել	n=156
[jg]	'hajg bə'rujg	masc. name question mark	Հայկ պարոյկ	n=20

But as an accidental gap, the *Kouyoumdjian* dictionary doesn't list any final /jp<sup>h</sup>/ or /jb/ words. Such clusters however are not impossible, but they may be restricted to loanwords. For example, the name of the first Armenian letter is [ajp<sup>h</sup>] այբ, possibly a loanword of 'alpha'. For /jb/, Armenian Wiktionary lists some such words (written with final յպ) but these seem to all be Russian loanwords.

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The glide can precede an affricate (Table 4.22). The *Kouyoumdjian* dictionary lists word with a /j/ + /ts, dz, dʒ/. The dictionary lacks /jtʃ/. This seems to be an accidental gap. Armenian Wiktionary likewise lacks words which would get pronounced with /jtʃ/ in Western Armenian.

Table 4.22: Complex codas where C1 is glide /j/, and C2 is an affricate

[jts]	'ajts sɑ'rujts	'visit' 'frost'	այց սառոյց	n=221
[jdʒ]	'ajdz ɑr'gajdz	'goat' 'wavering'	այծ առկայծ	n=71
[jdʒ]	bɑ'dʒujdʒ	'adorned'	պաճոյճ	n= 22

The glide can also precede a voiced or voiceless fricative (Table 4.23). The *Kouyoumdjian* dictionary lists word with a /j/ + /s, z, ʃ, ʒ/.

Table 4.23: Complex codas where C1 is glide /j/, and C2 is a fricative

[js]	'hqjs 'lujs	'paste' 'light'	հայս լոյս	n=220
[jz]	'hujz əj'gujz	'sap' 'walnut'	հոյզ ընկոյզ	n=84
[jʃ]	kʰə'mujʃ	'imagination'	քմոյշ	n=26
[jʒ]	'dujʒ	'damage'	տոյժ	n=48

For final [ujʃ] and [ujʒ] sequences, such pronunciations are rather archaic for most roots. The modern language tends to turn such [ujʃ] sequences to [uj], such as archaic [ɑnujʃ] անոյշ but modern [ɑnu] անուշ 'sweet'. Similarly, most words with final [ujʒ] are pronounced with final [uʒ], such as archaic [ujʒ] ոյժ vs. modern [uʒ] ուժ 'strength'.

The fricatives /f, v, h/ are generally rare so their absence after /j/ is not surprising. Armenian Wiktionary listed a handful of words with final /jʃ, jv/; all of these are loanwords such as [sejv] 'save' սեյվ or [sejʃ] 'safe (n)' սեյֆ.

For the uvular /χ, ʁ/, these sounds aren't generally rare. The absence of /jχ/ or /jʁ/ may be an accidental gap. For example on Armenian Wiktionary, we found only two words that end in /jχ/, both of these are loanwords such as [ʃejχ] 'sheikh' շեյխ. For /jʁ/, Armenian Wiktionary only had one word [ʃujʁ] շույր which was listed as a dialectal word, and thus wouldn't be in Western Armenian.

Finally, the glide can be precede any other sonorant: /m, n, r, l/ (Table 4.24).

### 4.3 Syllabification of final two-consonant clusters

Table 4.24: Complex codas where C1 is glide /j/, and C2 is a sonorant

[jm]	'gəjm	'mast'	կայմ	n=10
[jn]	tsəjn	'voice'	ծայն	n=407
	sə'gəjn	'but'	սակայն	
[jr]	'zəjr	'rock'	ժայռ	n=282
	ham'p <sup>h</sup> ujr	'kiss'	համբոյր	
[jl]	'k <sup>h</sup> əjl	'wolf'	գայլ	n=138
	ʃə'rajl	'prodigal'	շռայլ	

Note that for [jm], although this coda is possible, it seems very rare. For example, all of Kouyoumdjian's examples were for compounds with the final root [gəjm] 'mast'. As we discuss elsewhere in Section §4.3.3.10), final [Cm] codas have quite complicated behaviors. Furthermore, word-medial [jm] codas seem even rarer (§4.5.2.1).

#### 4.3.2 Falling sonority but either rare, extrasyllabic, or uses schwa epenthesis

The previous section looked final consonant clusters that were a) falling sonority, and b) were commonly syllabified as complex codas. This section goes through cases of falling sonority cluster that for some reason or another are either a) rare complex codas, b) potentially fake complex codas made up a coda and an appendix, or c) get an epenthetic schwa. Such clusters and their behavior are the following:

- Fricative /f,v/ + stop or affricate: rare, likely just accidental gaps (§4.3.2.1)
- Fricative /s,ʃ/ + affricate: unattested, either accidental gaps or banned (§4.3.2.1)
- Fricative /z,ʒ/ + stop or affricate: unattested, likely just accidental (§4.3.2.1)
- Fricative /h/ + stop or affricate: rare, likely just coda + appendix (§4.3.2.4)
- Nasal /m/ + non-labial stop or affricate: rare, either generally banned or coda + appendix (§4.3.2.4)
- Nasal /m,n/ + fricative: rare word-finally; unclear if rarity is because of a ban or just accidental gaps. Somewhat avoided word-medially (§4.3.2.6)
- Rhotic /r/ + nasal /n/: rare word-finally, and often avoided with schwa epenthesis (§4.3.2.7)
- Lateral /l/ + obstruent: rare and most are analyzable as coda + appendix (§4.3.2.8)
- Lateral /l/: nasal /m/: unattested outside of loanwords (§4.3.2.9)
- Lateral /l/ + nasal /n/: triggers schwa epenthesis (§4.3.2.10)

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### 4.3.2.1 Fricative /f, v/ + stop or affricate

In general, the fricatives /f, v/ seem to avoid being the first consonant in a complex coda. In the [Kouyoumdjian \(1970\)](#) dictionary, we found very few words with such clusters. The words which existed are also low-frequency words.

When C1 is a fricative /f/, the C2 can be a stop /p, t, k/ (Table 4.25). /fp/ and /ft/ seem restricted to loanwords, especially Biblical loanwords as in the table below or other Semitic loanwords like [naft] ‘oil’ նափթ. /fk/ seems restricted to cases where the *k* is the nominalizer suffix *-k<sup>h</sup>-p*. Thus the /fk/ cluster could arguably be treated as being a false complex coda, where *f* is a coda but *k* is an appendix.

Table 4.25: Final CC clusters where C1 is fricative /f/

[fp]	‘hofp	‘Job’	Յովք	n=1
[ft]	‘naft	‘naphta’	նափթ	n=12
	beh’moft	‘behemoth’	բեհմովթ	
[fk]	χo’rofk	‘roasting’	խորովք	n=29
	cf. χoro’v-e-l	‘to roast’	խորովել	

When C1 is /v/, C2 can be /b, d, g/ (Table 4.26). Again, these words are few and rare. Of the words in ([Kouyoumdjian 1970](#)), a lot of these words are names of flora and fauna; these may possibly be old loanwords.

Table 4.26: Final CC clusters where C1 is fricative /v/

[vb]	zi’lavb	‘white broom (plant)’	ծիլաւպ	n=1
[vd]	ara’bovd	‘dried fig’	արաբովտ	n=5
	heresi’jovd	‘heretic’	հերեսիովտ	
[vg]	mani’jovg	‘madioc plant’	մանիովկ	n=2
	k <sup>h</sup> ə’xavg	‘small river fish’	գղաւկ	

We found no cases of Western words with a labial fricative and then an affricate. One possible case is a non-Western dialectal word քովք on Wiktionary, which seems to have something to do with taxes. We can at best guess that it’s pronounced as [t<sup>h</sup>oftʃ]. The rarity of such cases suggests that Western Armenian just doesn’t have such clusters.

### 4.3.2.2 Fricative /s, ʃ/ + affricate

It seems that /s, ʃ/ cannot form a complex coda with affricates. We found no final /s, ʃ/ + affricate examples in either the [Kouyoumdjian](#) dictionary or Armenian

Wiktionary. This may just be an accidental gap. But this could be also due to some constraint against having an /s,ʃ/ + affricate cluster because both the fricatives and the affricate would have their own type of frication. To illustrate, the voiceless affricates are /t͡s, t͡ʃ/, and they both have end in a fricative-like element. Thus, it is possible that Armenian bans words like \**ast͡s* in order to avoid a complex coda that both starts and ends with an s-like element.<sup>1</sup>

#### 4.3.2.3 Fricative /z, ʒ/ + stop or affricate

There seems to be an accidental gap such that there are no words that end in a [zC] or [ʒC] cluster.

For [zC], the absence of final [zC] words may just be an accidental gap since a) Eastern Armenian can end in such sequences like [skizb] ‘beginning’ <skizp> սկիզբ, and b) other fricatives like /s/ don’t have such gaps. It is possible that this accidental gap arose via diachrony. Orthographically, a Western cluster [zb] would be written as quյ <zb>. But such an orthographic cluster would have to be pronounced as [zp] in Classical Armenian and Eastern Armenian; such a cluster is unattested for Eastern Armenian (= 0 hits on Wiktionary). In contrast, a [zb] cluster in Classical/Eastern would correspond to a [sp] cluster in Western: [əskisp] ‘beginning’. Thus, in the development of Classical to modern Western Armenian, [zb] sequences switched to being [sp], but no such original cluster could have changed to [zb].

Note that although there are many words that end in an orthographic cluster of <z> plus a voiceless sound, such clusters are pronounced as voiceless: <azk> [ask] ‘people’ ազգ. See Section §2.4.2.

Similar for [ʒC], it is unclear if Western Armenian either a) bans [ʒC] complex codas as a language-general rule, or if b) the absence of such clusters is an accidental gap. It is possible that the absence of such clusters is an accidental gap that’s caused by diachrony, for the same reasons as for the absence of [zC] clusters.

#### 4.3.2.4 Fricative /h/ + stop or affricate

The fricative /h/ seems to avoid being in a complex coda (Table 4.27). In the (Kouyoumdjian 1970) dictionary, we found only 5 words that end in a falling-sonority /hC/ cluster. For C2, all these words involved the suffix -*k<sup>h</sup>* -ք, suggesting

<sup>1</sup>Wiktionary did have some Russian loanwords with a final /t͡ʃ/ clusters, but these don’t exist in Western Armenian. And even if they did exist, loanwords often violate a language’s phonological constraints.

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that these words may instead be parsed as ending in a coda+appendix rather than a complex coda.

Table 4.27: Final CC clusters where C1 is fricative /h/

'χah-k	'kitchen'	խաղք	cf. 'χah	'dish'	խահ
'bah-k	'fasting'	պաղք	cf. 'bah	'preservation'	պահ
p <sup>h</sup> ert <sup>h</sup> -a-ba h-k	'garrison'	բերդապաղք	cf. p <sup>h</sup> ert <sup>h</sup>	'fortress'	բերդ
ʃap <sup>h</sup> at <sup>h</sup> -a-ba h-k	'Sabbatarians'	շաբաթապաղք	cf. ʃap <sup>h</sup> at <sup>h</sup>	'Saturday'	շաբաթ

On Armenian Wiktionary, we found a handful more words with a final [hC] cluster, but these were all limited to specific non-standard dialects like Karabagh Armenian, thus their pronunciations cannot be extended to Western Armenian.

##### 4.3.2.5 Nasal /m/ + non-labial stop or affricate

The nasal /m/ seems to start clusters only with labial stops, and it avoids all other consonants.

For example, the *Kouyoumdjian* dictionary lists zero final /mt<sup>h</sup>, md/ clusters. It has only one final /mg/ word: [damg] 'damp' տամկ. The dictionary states that this word is derived from a synonymous [damug] տամուկ. This suggests that this word [damg] is just a grammaticalized weak form of the larger [damug] word. Armenian Wiktionary provides a handful of examples of final orthographic <mt, mt', md>, but these are all either loanwords or obscure dialectal words that aren't found in Western Armenian.

Before velar /k<sup>h</sup>/, the nasal /m/ is found (Table 4.28). *Kouyoumdjian* lists 18 final /mk<sup>h</sup>/ words. But, all of these examples involve the nominalizer suffix -k<sup>h</sup> -ք. So these examples could arguably be syllabified as a coda + appendix -k<sup>h</sup>.

Table 4.28: Final CC clusters where C1 is nasal /m/ and C2 is nominalizer /k<sup>h</sup>/

t <sup>h</sup> em-k <sup>h</sup>	'face'	դէմք	cf. t <sup>h</sup> em	'facing'	դէմ
gam-k <sup>h</sup>	'will'	կամք	cf. ga'm-i-l	'to will' (√-TH-INF)	կամիլ
χə'nām-k <sup>h</sup>	'care'	խնամք	cf. χə'nām	'care'	խնամ
ʃo'ʁom-k <sup>h</sup>	'flattery'	շողոմք	cf. ʃo'ʁom	'flattery'	շողոմ
ha'mem-k <sup>h</sup>	'aromatics'	համեմք	cf. ha'mem	'aroma'	համեմ

Neither *Kouyoumdjian* nor Wiktionary provided any examples of final /m/ + affricate clusters.



## 4.3.2.6 Nasal /m,n/ + fricative

Nasals can form complex codas with stops and affricates. But it seems that nasals rarely form complex codas with fricatives. In *Kouyoumdjian* dictionary, we found only 19 words that end in a <VNC> cluster a) where N is a nasal, b) C is a fricative, and c) the fricative is part of the root (Table 4.29).<sup>2</sup> All 19 of these examples had the cluster /ms/. The nasal-fricative cluster is pronounced.

Table 4.29: Final CC clusters where C1 is nasal /m/ and C2 is fricative /s/

'koms	'count'	կոմս
'doms	'ticket'	տոմս
t <sup>h</sup> ə'am + 'doms	'money + ticket'	դրամ, տոմս
→ t <sup>h</sup> əram-a-'doms	'banknote'	դրամատոմս

There are two generalization. First, it seems that the nasal /m/ can form a cluster with only the fricative /s/, and with no other fricative. Based on this, we argue that the /s/ in these words is actually an extrasyllabic appendix /-s/, not part of a complex coda. See Section §4.3.3 for more data on this appendix. As counter-examples, we only found a few cases of orthographic <m>+fricative clusters on Armenian Wiktionary. All these were either obvious loanwords like [t<sup>h</sup>ərijumf] 'triumph' տրիումֆ, dialectal words, or words that can exist in Eastern Armenian but not Western.

Second, the nasal /n/ seems to avoid forming word-final complex codas with fricatives. We found zero such examples in *Kouyoumdjian*. On Armenian Wiktionary, the attested examples look primarily as either loanwords like [alijans] 'alliance' ալիանս or [oranʒ] 'orange' օրանժ, or obscure dialectal words from non-Western Armenian.

However, it seems easier to find /n/+fricative complex codas inside words than at the end of words (§4.5.2.3). Consider /nf/. The native lexicon doesn't have any word-final [nf] complex codas. For example, Wiktionary lists a handful of such words and they're obvious loanwords: [romanʃ] 'Romansch' ռոմանշ. But it seems possible to create such clusters word-medially. Consider the word 'pressure' [dʒənf-um] ճնշման. The suffix /-um/ is a special nominalizer suffix. For

<sup>2</sup>This last condition is important because there are some words like <ims> [iməs] 'mine' իմս, which although they end in an orthographic <ms> cluster, the <s> is actually the possessive suffix is -s. This suffix always triggers schwa epenthesis after consonants (cite chapter possessive schwa).

words with this nominalizer suffix, the standard genitive form is created by replacing [-um] with [-m-an]: [dʒənʃ-m-an]. However in casual speech, HD observes that his speech almost always turns this [nʃ] sequence into [ntʃ]. It's an open question if such behavior means that [nʃ] complex codas are truly absent from Armenian, or if the affrication is a type of low-level phonetic change.

Similarly, although we couldn't find a word with a final [nχ] cluster, we did find a few cases with word-medial [nχ]. For the latter category, the passive suffix /v/ can follow complex codas in Eastern Armenian: [kanχ.vel] 'to be anticipated' կանխվել, but not in Western Armenian [ɡan.χə.vil] կանխիլ. This suggests that word-medial [nχ] are possible in principle, just rare, and they are subject to dialectal variation.

#### 4.3.2.7 Rhotic /r/ + nasal /n/

The rhotic /r/ can form a complex coda with any obstruent and with the nasal /m/. But with the nasal /n/, we find the following complications:

- with monosyllabic roots, the /rn/ cluster preferably gets epenthesis [rən], but schwa-less [rn] is possible in casual speech for some words
- with polysyllabic roots, the /rn/ cluster avoids epenthesis for some roots to get [rn]
- with compounds that have a monosyllabic final root, the /rn/ again prefers epenthesis [rən]

More restrictions are found when the /rn/ sequence is word-medially, discussed in Section §4.5.2.2.

For the first group of 'monosyllabic roots' (Table 4.30), the root orthographically has one vowel followed by a cluster <rn> ռն or <rn> ռն: <xaɾn> 'mixed'. Prescriptively, the final rhotic-nasal sequence is pronounced with an intervening epenthetic schwa: [χaɾən]. This is the 'prescriptive rule' to pronounce these words. In casual speech, the norm is to also use the schwa, but it is possible to delete the schwa: [χaɾn]. Kouyoumdjian lists 24 such roots.

Table 4.30: Final CC clusters where C1 is rhotic /r/ and C2 is nasal /n/  
– 'monosyllabic' root

<xaɾn>	[χaɾən]	'mixed'	խառն
<tseɾn>	[tseɾən]	'hand'	ձեռն
<taɾn>	[tʰaɾən]	'bitter'	դառն
<saɾn>	[saɾən]	'mountain'	սառն
<puɾn>	[pʰuɾən]	'fist'	բռն
<t'oɾn>	[tʰoɾən]	'grandson'	թոռն

It is an open question on how often the schwa-less forms are used in natural speech, and it's unknown what linguistic or extra-linguistic factors would condition the optional use of the schwa-less form.

Alongside the above orthographically monosyllabic roots, there are also orthographically polysyllabic roots (Table 4.31). These roots contain two orthographic vowels, and end in a rhotic-nasal sequence: <eyerɲ> 'crime'. However for pronunciation, the norm is to **not** add a schwa: [jeʁɲ]. We found 23 such roots in *Kouyoumdjian*. For some of these words though, the use of schwa is possible: [tʰitʰer(ə)n] 'butterfly'.

Table 4.31: Final CC clusters where C1 is rhotic /r/ and C2 is nasal /n/ – 'polysyllabic' root

<eyerɲ>	[jeʁɲ]	'crime'	եղեռն
<tʰitʰerɲ>	[tʰitʰerɲ]	'butterfly'	թիթեռն
<agarɲ>	[ɑʁɲ]	'citadel'	ակառն
<gawarɲ>	[gɑʁɲ]	'trench'	կառառն
<ʃowarɲ>	[ʃɑʁɲ]	'lance'	շուռառն
<liserɲ>	[liʁɲ]	'axle-tree'	լիսեռն

In terms of frequency, although there's equal numbers of both roots in *Kouyoumdjian*'s dictionary, the two groups have impressionistically difference usages. The monosyllabic roots are very common words, while the polysyllabic roots are all very low-frequency. It is possible that the difference in prosodic behavior is tied with this frequency difference.

It is possible that the over-arching generalization is that word-final [rɲ] complex codas prefer being in minimally bisyllabic words, thus triggering epenthesis in a word like [χʰarɲ] 'mixed'. However, when compounds are formed from these /rɲ/-final words (Table 4.32), we find that the compound inherits the schwa behavior of its component stems: [avaz-ɑ-χarɲ] 'sand mixed'. *Kouyoumdjian* lists 148 such compounds with a final 'monosyllabic' root.

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Table 4.32: Final CC clusters where C1 is rhotic /r/ and C2 is nasal /n/ – derived compounds

ɑ'vaz + 'χarən	‘sand + mixed’	աւազ, խառն
→ avaz-ɑ-'χarən	‘sand mixed’	ազատախառն
sa'gav + 'χarən	‘few + hand’	սակաւ, ձեռն
→ sagav-ɑ-'tserən	‘sand mixed’	սակաւածեռն
t <sup>h</sup> e't <sup>h</sup> ev + 'p <sup>h</sup> erən	‘light + load’	թեթեւ, բեռն
→ t <sup>h</sup> et <sup>h</sup> ev-ɑ-'p <sup>h</sup> erən	‘sand mixed’	թեթեւաբեռն
ha'rɪr + 't <sup>h</sup> urən	‘hundred + door’	հարիւր, դուռն
→ harɪr-ɑ-'t <sup>h</sup> urən	‘having a hundred doors’	հարիւրադուռն

Polysyllabic roots like [t<sup>h</sup>it<sup>h</sup>er(ə)n] butterfly also percolate their lack of a schwa to compounds. But such compounds are even rarer than their component root. *Kouyoumdjian* lists only 14 such compounds: [ɑtʃ-ɑ-t<sup>h</sup>it<sup>h</sup>erən] ‘pavonian butterfly’.

##### 4.3.2.8 Lateral /l/ + obstruent

For the lateral /l/, this sound seems to avoid starting a complex coda in native Armenian words.

When C1 is /l/ and C2 is anything but the nominalizer /k<sup>h</sup>/ (Table 4.33), the *Kouyoumdjian* dictionary lists only 16 words. 13 look like obvious loanwords. The other 3 have an unclear origin.

Table 4.33: Final CC clusters where C1 is lateral /l/ and C2 is not nominalizer /k<sup>h</sup>/

'alp <sup>h</sup>	‘alpha’	ալփ	gelb	‘kelp’	կելպ
'volt <sup>h</sup>	‘volt’	վոլթ	as'pald	‘asphalt’	ասփալտ
go'p <sup>n</sup> alt <sup>h</sup>	‘cobalt’	կոբալտ	əs'pald	‘spalt’	սպալտ
ba'sald	‘basalt’	պասալտ	ba'zald	‘basalt’	պազալտ
t <sup>h</sup> alg	‘talc’	թալկ	t <sup>h</sup> alk <sup>h</sup>	‘talc’	թալք
go'balg	‘copalche’	կոպալկ	'vals	‘waltz’	վալս
'film	‘film’	ֆիլմ			
k <sup>h</sup> alχ	‘horned cumin’	քալխ	'kulb	‘common gromwell’	դուլպ
sa'pald	‘raw fruit’	սաբալտ			

Many such clusters are found on Armenian Wiktionary. Again, it seems that many of Wiktionary’s examples are loanwords, obscure flora/fauna, or obscure

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dialectal words. Whether or not there are some Armenian dialects that allow /lC/ doesn't say anything about the avoidance of such clusters in Western Armenian.

The above data show that /lC/ clusters are generally restricted to non-native words (Table 4.34). Spurious counter-examples are words with a final /lk<sup>h</sup>/ sequence (32 words in *Kouyoumdjian*). But here, the /k<sup>h</sup>/ is part of the nominalizer suffix -k<sup>h</sup> -ք; so all these words could be syllabified as ending in a coda /l/ + appendix /k<sup>h</sup>/.

Table 4.34: Final CC clusters where C1 is lateral /l/ and C2 is nominalizer /k<sup>h</sup>/

'jel-k <sup>h</sup>	'ascent'	ելք	cf. je'l-ɑd͡z	'risen' (√-RPTCP)	ելած
'χel-k <sup>h</sup>	'mind'	խելք	cf. χel-ɑ'tsi	'smart' (√-ADJZ)	խելացի
'tsol-k <sup>h</sup>	'flash'	ցոլք	cf. tso'l-ɑ-l	'to flash' (√-TH-INF)	ցոլալ
ɑr'k <sup>h</sup> el-k <sup>h</sup>	'obstacle'	արգելք	cf. ɑrk <sup>h</sup> e'l-it͡ʃ	'preventative' (√-ADJZ)	արգելիչ
de'sil-k <sup>h</sup>	'apparition'	տեսիլք	cf. de'sil	'sight'	տեսիլ

check macak to see whats wrong with the liquid

#### 4.3.2.9 Lateral /l/ + nasal /m/

We could not find any native words with a final <lm> in *Kouyoumdjian*. The only case we found was the obvious loanword [film] 'film' ֆիլմ. Wiktionary likewise only had loanwords.

#### 4.3.2.10 Lateral /l/ + nasal /n/

The lateral /l/ generally avoids forming a complex coda with obstruents, with such clusters largely restricted to loanwords (§4.3.2.8). When a word ends in an orthographic <ln> sequence (Table 4.35), we find obligatory schwa epenthesis. *Kouyoumdjian* lists only 13 such words.

Table 4.35: Schwa epenthesis in final CC clusters where C1 is lateral /l/ and C2 is nasal /n/

<owln>	[ʼulən]	'neck'	ուլն
<anowln>	[ɑ'nulən]	'Spanish spider'	անուլն
<partsealn>	[part'ɾjalən]	'the Most High (God)'	բարձրեալն

### 4.3.3 Flat or rising sonority and either rare, extrasyllabic, or uses schwa epenthesis

Armenian orthography has many words that end in a consonant cluster that has flat or rising sonority. Some of these form rare complex codas, some are likely a coda + appendix, and some undergo schwa epenthesis.

1. When C1 is a stop:

- + stop or affricate: rare and most are either loanwords or coda + appendix /-k<sup>h</sup>/ (§4.3.3.1)
- + fricative: rare, some are likely a coda + appendix, and some take schwa epenthesis (§4.3.3.2)
- + nasal: either loanword or takes schwa epenthesis (§4.3.3.3)
- + rhotic /r/: usually schwa epenthesis, but schwa-less forms are possible (§4.3.3.4)
- + lateral /l/: loanwords and takes schwa epenthesis (§4.3.3.5)

2. When C1 is an affricate:

- + stop: rare and most are either loanwords or coda + appendix /-k<sup>h</sup>/ (§4.3.3.6)
- + fricative: rare and most undergo schwa epenthesis (§4.3.3.7)
- + sonorant: rare and undergoes schwa epenthesis (§4.3.3.8)

3. When C1 is a fricative:

- Fricative + fricative: most use a fricative appendix, and some have schwa epenthesis (§4.3.3.9)
- + nasal /m/: relatively common and likely just coda + appendix (§4.3.3.10)■
- + nasal /n/: relatively common and undergoes schwa epenthesis (§4.3.3.11)■
- + rhotic /r/: rare and undergoes schwa epenthesis, with possible schwa elision (§4.3.3.12)
- + lateral /l/: rare and undergoes schwa epenthesis (§4.3.3.13)

4. When C1 is a nasal:

- + nasal /m/: rare and undergoes schwa epenthesis (§4.3.3.14)
- + nasal /n/: common and undergoes schwa epenthesis (§4.3.3.15)
- + rhotic /r/: rare and undergoes schwa epenthesis (§4.3.3.16)
- + lateral /l/: rare and undergoes schwa epenthesis (§4.3.3.17)

## 4.3.3.1 Stop + stop or affricate

Orthographically, final stop + affricate clusters are exceedingly rare. We found no cases in *Kouyoumdjian*. As for Armenian Wiktionary, they seem restricted to loanwords like [əskottʃ~əskotʃ] ‘scotch tape’ սքոթջ.

We did find cases of final stop-stop clusters. Such final stop-stop clusters are limited to three categories: some roots, some loanwords, and an open class of words where the nominalizer  $-k^h$  is added after root-final stop.

For the first category, we found some native roots on Wiktionary, such as [tsɑdɡ] ‘jump’ ցատկ and [dagd] ‘musical bar’ տակոն on Wiktionary. *Kouyoumdjian* did not have any such roots. Word-medially, a handful more cases are found like [dʒəb.d.jɑl] ‘incognito’ ծպտեալ, but HD feels that the avoidance of this complex coda feels more common: [dʒəb.d.jɑl].

For the second category, the *Kouyoumdjian* dictionary listed only two words which had stop-stop coda (Table 4.36). These words seem to be loanwords judging by how their Armenian form was very similar to their translation.

Table 4.36: Final CC clusters where C1 and C2 are stops

tʃɑl'kubd	‘true jalap’	ջալիուպտ
k <sup>h</sup> ɑ'ript	‘charpybdis’	քարիբդ

More loanwords are found on Wiktionary, such as [fɑɡd] ‘fact’ ֆակտ. As for the third category, The segment  $k^h$  is special in how it can follow any type of consonant or consonant-cluster. This is because Armenian has a nominalizer suffix  $-k^h$ -ք that is used to form many nouns. This suffix can be added after any consonant even if it creates a flat-sonority cluster. When this suffix is added, it triggers the devoicing of preceding obstruents (§3.3.7.4).

In *Kouyoumdjian*’s dictionary, the nominalizer  $-k^h$  is quite common after any stop: [dʒup-k] ‘fluctuation’ (Table 4.37). It triggers devoicing of preceding stops: [jerɑχʃep-k] ‘torment’. It can also follow a velar stop /k<sup>h</sup>, g/ to create a long (geminate) version of itself: [k<sup>h</sup>ɑk-k<sup>h</sup>] ‘separation’.

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Table 4.37: Final CC clusters where C1 is a stop and C2 is an appendix /k<sup>h</sup>/

/p-k <sup>h</sup> /→[p-k]	<sup>h</sup> dzup <sup>h</sup> dzup-k	‘fluctuation’ (√) ‘fluctuation’ (√-NMLZ)	ծուփ ծուփք	n=3
/b-k <sup>h</sup> /→[p-k]	jerax <sup>h</sup> feb jerax <sup>h</sup> feb-k	‘scar’ (√) ‘torment’ (√-NMLZ)	երաշխէպ երաշխէպք	n=7
/t-k <sup>h</sup> /→[t-k]	axot <sup>h</sup> -e-l axot-k	‘to pray’ (√-TH-INF) ‘prayer’ (√-NMLZ)	աղօթել աղօթք	n=15
/d-k <sup>h</sup> /→[t-k]	axed axep-k	‘misfortune’ (√) ‘calamity’ (√-NMLZ)	աղէտ աղէտք	n=42
/k-k <sup>h</sup> /→[k-k <sup>h</sup> ]	hok <sup>h</sup> hok-k <sup>h</sup>	‘concern’ (√) ‘hindrance’ (√-NMLZ)	հոգ հոգք	n=5
/k-k <sup>h</sup> /→[k-k <sup>h</sup> ]	hok <sup>h</sup> hok-k <sup>h</sup>	‘concern’ (√) ‘hindrance’ (√-NMLZ)	հոգ հոգք	n=39
/g-k <sup>h</sup> /→[k-k <sup>h</sup> ]	k <sup>h</sup> ak <sup>h</sup> k <sup>h</sup> ak-k <sup>h</sup>	‘to untie’ (√-TH-INF) ‘separation’ (√-NMLZ)	քակել քակք	n=39

##### 4.3.3.2 Stop + fricative

It is relatively rare to find word-final orthographic clusters that end in a stop + fricative. In the *Kouyoumdjian* dictionary, we found the following categories: stop + /s/, stop + /χ/, and stop + /ʁ/. For /Cs/ and /Cχ/, the stop-fricative cluster is pronounced together without schwa epenthesis. The final fricative acts as an appendix. But for /Cʁ/, we find schwa epenthesis

For stop + /s/, we found many examples (Table 4.38). The stop can be a voiceless [p, t, k].

Table 4.38: Final CC clusters where C1 is a stop and C2 is a fricative /s/

[ps]	t <sup>h</sup> ips je'reps	‘sirup’ ‘priest’	տիբս երեփս	n=4
[ts]	han'beds um'beds	‘vainly’ ‘uselessly’	յանպէտս ումպէտս	n=4
[ks]	me'daks əsta'moks	‘silk’ ‘stomach’	մետաքս ստամոքս	n=19

For the stop + /s/ clusters, it's difficult to tell how many of these are purely native words vs. old nativized borrowings, such as the word for [əstamoks] ‘stom-



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ach’ which has an old Greek origin (Աճառյալս 1971b: 269), or the obvious loanword [gegrops] ‘Cecrops’ Կեկրոպս.

For some words, the final /s/ is potentially ambiguous with a possessive suffix /-s/. This suffix is pronounced with a schwa after a consonant: /p<sup>h</sup>ar-s/ [p<sup>h</sup>ar-əs] ‘my finger’ բառս. For an archaic low frequency word like <yeds> յետս ‘behind’, it wouldn’t be surprising if some speakers parsed this word as one root [hets], or as a complex word with a root /hed/ ‘with’ and possessive suffix /s/: [hedəs]. On Armenian Wiktionary, we’ve found variation in how orthographic stop+/s/ clusters are transcribed, suggesting this same ambiguity from morphology.

For stop + /χ/, we found only one example in Kouyoumdjian: [dipχ] ‘common mistletoe’ տիպիս.

For stop + /ɣ/, these are relatively few (Table 4.39). They take schwa epenthesis.

Table 4.39: Schwa epenthesis in final CC clusters where C1 is a stop and C2 is a fricative /ɣ/

<bɣ>→[bəɣ]	<gowbɣ>	‘gubəɣ	‘padlock’	կոսպղ	n=2
<dɣ>→[dəɣ]	<sidɣ>	‘sidəɣ	‘waterpot’	սիսող	n=8
<kɣ>→[k <sup>h</sup> əɣ]	<ʃikɣ>	‘ʃik <sup>h</sup> əɣ	‘hock’	շիգղ	n=3
<gɣ>→[gəɣ]	<sigɣ>	‘sigəɣ	‘shekel’	սիկղ	n=1

Based on comparing the Kouyoumdjian dictionary against Wiktionary, it seems that all other possible stop + fricative clusters are either unattested, found in non-Western dialects, or are loanwords: [vakf] ‘waqf’ վակֆ.

#### 4.3.3.3 Stop + nasal

There are words which end in an orthographic stop + nasal cluster. In native words, the nasal is always /n/. We could not find native words with /m/.

For final stop + /m/ clusters, Kouyoumdjian had no such examples. On Wiktionary, we found some examples but they all seem like loanwords: [rit<sup>h</sup>m~rit<sup>h</sup>əm] ‘rhythm’ ռիթմ with unclear syllabification.

As for stop + /n/, we always find schwa epenthesis in pronunciation (Table 4.40). Many of these words though have an archaic connotation, or are restricted to high-level formal registers.

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Table 4.40: Schwa epenthesis in final CC clusters where C1 is a stop and C2 is a nasal /n/

<p(ʻ)n>→[pʰən]	<apʻn>	ʻapʰən	‘shore (archaic)’	ափն	n=8
<t(ʻ)n>→[tʰən]	<katʻn>	ʻgatʰən	‘milk (archaic)’	կաթն	n=3
<dn>→[dən]	<odn>	voʻdən	‘foot (archaic)’	ոտն	n=103
	<madn>	maʻdən	‘finger (archaic)’	մատն	
<k(ʻ)n>→[kʰən]	<yantowkn>	hanʻtʰukʰən	‘audacious’	յանդուզն	n=18
	<yokn>	ʻhokʰən	‘numerous’	յոքն	
<g(ʻ)n>→[gən]	<tsʻagn>	ʻtsaɡən	‘misery’	ցալկն	n=76
	<arekagn>	areʻkʰaɡən	‘sun’		

We could not find final <bn>→[bən] clusters on either *Kouyoumdjian* or Wiktionary, but this is likely an accidental gap.

For final <dn>→[dən], *Kouyoumdjian* listed 103 such words. The vast majority of them (n=99) were derived from the words ‘foot’ or ‘finger’: [vartʰ-a-madən] ‘rose-fingered’ վարդամատն.

The reason why many of these words have an archaic connotation is because of word-final nasal deletion in final <Cn> cluster. Such a nasal deletion happened in the development of Classical Armenian to Modern Armenian. Thus the Classical word for ‘finger’ is traditionally pronounced as [madən] մատն, while the modern common word is just [mad] մատ. The nasal is retained in archaic-sounding words and their derivatives. See *cite nasal liaison* for more discussion on such nasals.

##### 4.3.3.4 Stop + rhotic /r/

Word-finally, stop + /r/ usually undergo schwa epenthesis (Table 4.41). This is the prescriptive norm, but there is a degree of variation. The rhotic /r/ can be orthographically either <r> ռ or <ř> ռ.

### 4.3 Syllabification of final two-consonant clusters

Table 4.41: Schwa epenthesis in final CC clusters where C1 is a stop and C2 is a rhotic /r/

<pr>→[p <sup>h</sup> ər]	<ipr>	‘ip <sup>h</sup> ər	‘as’	իբր	n=1
<br,br̥>→[bər]	goibr>	‘gubər	‘tar’	կուպր	n=4
<t(̣)ṛ̣>→[t <sup>h</sup> ər]	<k’aratr>	k <sup>h</sup> ɑ’rat <sup>h</sup> ər	‘plover’	քարադր	n=14
	<mēt’r>	‘met <sup>h</sup> ər	‘meter’	մէթր	
<dr>→[dər]	<nōdr>	‘nodər	‘cursive’	նօտր	n=33
	<adr>	‘adər	‘flame’	ատր	
<k’r>→[k <sup>h</sup> ər]	<dakr>	‘dak <sup>h</sup> ər	‘brother-in-law’	տազր	n=6
<gr,gr̥>→[gər]	<sagr>	‘sagər	‘axe’	սակր	n=3

Prescriptively, the norm is to have a schwa in a word-final stop-rhotic cluster: <p’ok’r> → [p<sup>h</sup>ok<sup>h</sup>ər] ‘small’ փոքր. But in casual speech, some of these words can be pronounced without a schwa: [p<sup>h</sup>ok<sup>h</sup>r]. The absence of this schwa is possibly tied with schwa elision (§3.6.4). The absence of this schwa does however vary across the types of stops. For example, [k<sup>h</sup>ər] sequences can easily simplify to [k<sup>h</sup>r] in speech: [vak<sup>h</sup>ər, vak<sup>h</sup>r] ‘tiger’ վազր. As can [t<sup>h</sup>ər] sequences and [dər] sequences: [met<sup>h</sup>ər, met<sup>h</sup>r] ‘meter’ մէթր, [dedər, dedr] ‘tract’ տնտր. But [p<sup>h</sup>ər] clusters don’t: [ip<sup>h</sup>ər] ‘as’ իբր.

#### 4.3.3.5 Stop + lateral /l/

Falling or rising sonority clusters with a final /l/ are quite rare. In the *Kouyoumdjian* dictionary, we found only 2 words that ended in an orthographic stop + <l> cluster. One is an obvious borrowing and gets schwa epenthesis: <kowntsɔabl>→[k<sup>h</sup>unt<sup>h</sup>əstəbəl] ‘constable’ զուկստապլ. The other is a possible native word. We’re unfamiliar with this word but we think it should be pronounced with a schwa as well: <mowgl>→[mugəl] ‘false myrrh’ մուկլ.

Outside of dictionary, we have come across other loanwords with final orthographic <Cl> cluster. Such clusters get epenthesis again: <ts’igl>→[tsigəl] ‘cycle’ ցիկլ.

#### 4.3.3.6 Affricate + stop

Affricates and stops both have low sonority. They usually cannot form a complex coda together. There are two classes of exceptions: a handful of roots, a handful of loanwords, and a large set of appendix-final words. This third category consists of words that end in the nominalizer -k<sup>h</sup>.

#### 4 Syllable structure

For the first class, the *Kouyoumdjian* dictionary listed only one word which has an affricate-stop coda. That word is a compound [sal-a-dzadzɟ] ‘paved with stones’ that used the root [dzadzɟ] ‘cover’ ծածկ.

For the second category of loanwords, Armenian Wiktionary list some examples such as [tonetsk] ‘Donetsk’ Դոնեցկ.

The third category are words with the nominalizer  $-k^h$ , which violates all the syllable structure rules of Armenian (Table 4.42). This suffix can follow any consonant, including affricates, and it triggers devoicing. This suffix is analyzed as being an extrasyllabic segment simply because it consistently acts in a bizarre fashion.<sup>3</sup>

Table 4.42: Final CC clusters where C1 is an affricate and C2 is an appendix /k<sup>h</sup>/

/ts-k <sup>h</sup> /→[ts-k]	tʃaˈχats	‘mill’ (✓)	ջաղաց	n=55
	tʃaˈχats-k	‘mill’ (✓-NMLZ)	ջաղացք	
/dz-k <sup>h</sup> /→[ts-k]	daraˈdʒz-e-l	‘to spread’ (✓-TH-INF)	տարածել	n=71
	daraˈts-k	‘spread’ (✓-NMLZ)	տարածք	
/tʃ-k/→[tʃ-k]	χaχaˈtʃ-e-l	‘to gargle’ (✓-TH-INF)	խախաջել	n=23
	χaˈχatʃ-k	‘gargle’ (✓-NMLZ)	խախաջք	
/dʒ-k <sup>h</sup> /→[tʃ-k]	dʒodʒ	‘oscillation’ (✓)	ճոճ	n=4
	dʒotʃ-k	‘swing’ (✓-NMLZ)	ճոճք	

Note that the sequence [tsk] is quite common because the nominalizer  $-k^h$  can be added after the resultative participle suffix  $-adz$ , and cause devoicing: [ajr-adʒ] ‘burnt’ (✓-RPTCP այրած and [ajr-ats-k] ‘scald’ (✓-RPTCP-NMLZ) այրածք.

##### 4.3.3.7 Affricate + fricative

It is relatively rare to find final orthographic clusters of an affricate + fricative. In the *Kouyoumdjian* dictionary, we found only one word [p<sup>h</sup>itʃχ] ‘common ivy’ փիչխ where the affricate-fricative cluster is pronounced together without a schwa. The final /χ/ is one of the possible fricative appendixes that can be added at the end of syllables.

Besides this word, we found clusters which undergo schwa epenthesis: affricate + /s/, affricate + /ʃ/. Epenthesis is the norm (Table 4.43).

<sup>3</sup>Armenian Wiktionary also lists stop-stop clusters that are were dialectal non-Western words which seemed to use a cognate of the nominalizer  $-k^h$ . For example, we speculate that the entry <tʰinameʃˈg> թինամեչկ is one such entry, and Wiktionary just defines it as a possible cognate to some word թինկամեչք <tʰiknameʃˈkʰ> which ends in the nominalizer  $-k^h$ .

### 4.3 Syllabification of final two-consonant clusters

Table 4.43: Schwa epenthesis in final CC clusters where C1 is an affricate and C2 is a fricative

<ḡzy>→[dʒəɤ]	<godḡzy>	'godḡzəɤ	'stump' կոճղ	n=2
<ts'ŷ>→[tsəɤ]	<p'ots'ŷ>	'p <sup>h</sup> otsəɤ	'rake' փոցղ	n=1
<ts's>→[tsəs]	<tʃ'orits's>	tʃo'ritsəs	'four times' չորիցս	n=15

For affricate + /ɤ/, some of these words allow optional deletion of the schwa: [godḡzəɤ, godḡzɤ] 'stump'. This is part of schwa elision (§3.6.4).

For <ts's>→[tsəs], this sequence seems to be restricted to numeral-related words, e.g., <vetsitss>→[vetsitsəs] 'six times' վեցիցս.

#### 4.3.3.8 Affricate + sonorant

It is extremely rare to find any words which end in an orthographic affricate+sonorant cluster, such as hypothetical /ts+n/, /dʒ+r/, and so on. We found zero such cases in the *Kouyoumdjian* dictionary. Armenian Wiktionary also has few clear cases of such clusters. However, the data that we find shows that affricate + sonorant clusters pattern like stop+sonorant clusters in undergoing schwa epenthesis.

Although affricate + nasal clusters are un-attested, HD's intuition is that their syllabification is the same as stop+sonorant cluster. That is, because word-final /dn/ clusters undergo schwa epenthesis, then so does word-final /tsn/. For example, a nonce word մաղն <mats'n> is syllabified as [matsən]. But of course, because these words don't exist, we can't say much about them. We suspect that their absence is more of an accidental gap.

For affricate + rhotic clusters, the *Kouyoumdjian* dictionary doesn't list any words. But Wiktionary lists a handful. Here we find schwa epenthesis: <ts'adzr>→[tsadzər] 'low' ցածր.

#### 4.3.3.9 Fricative + fricative

Fricatives can take any stop to form a complex coda. Root-final fricative-fricative clusters do exist. But these are severely limited to a handful of fricative combinations, and to an apparent finite number of roots.

There are largely two categories of root-final fricative-fricative clusters. The first category are orthographic clusters that are pronounced as they are spelled, creating a consonant cluster in pronunciation: <dʒaxs> [dʒaxs] 'cost' ծախս. We analyze this category of clusters as containing an extrasyllabic final fricative. The second group is words that are spelled with a fricative-fricative cluster, but this cluster undergoes schwa epenthesis in speech: <ews> [jevəs] 'moreover' եւս.

#### 4 Syllable structure

We discuss the epenthetic group first because it is an extremely small class (Table 4.44). In *Kouyoumdjian*'s dictionary, we only found 3 words that end in an orthographic fricative-fricative cluster, and that get schwa epenthesis. These 3 words all use /vs/ and they are function words.

Table 4.44: Schwa epenthesis in final CC clusters where C1 and C2 are fricatives

<ews>	/ʃ(j)evs/	[ʃ'jevəs]	'moreover'	եւս
<ajlews>	/ɑjlevs/	[ɑj'levəs]	'anymore'	այլեւս
<t'erews>	/tʰerevs/	[tʰe'revəs]	'perhaps'	թերեւս

For the category of pronounced clusters, there are a handful of roots which end in a fricative + /χʃ,s/ (Table 4.45). The most frequent C2 is /χ/. Each type of /Cχ/ cluster is found in a handful roots: [χɑrisχ] 'anchor' խարիսխ. Such roots can be productively used to form new words via compounding and prefixation: [sar-ɑ-χɑrisχ] 'ice anchor' սառախարիսխ

Table 4.45: Final CC clusters where C1 is fricative and C2 is /χ/

/sχ/	χɑ'risχ	'anchor'	խարիսխ	# of roots n=2	# of derivatives n=11
	χo'risχ	'honey-comb'	խորիսխ		
/ʃχ/	'vaʃχ	'usury'	վաշխ	n=7	n=44
	je'raʃχ	'surety'	երաշխ		
/χχ/	'zeχχ	'lewd'	զեղիս	n=8	n=18
	'seχχ	'melon'	սեղիս		

For the /χχ/ clusters, the two segments are spelled differently <γx> ղիս, suggesting that they diachronically arose from two separate segments that eventually became an identical long (geminate) segment. In fact, one of the examples from *Kouyoumdjian* is the word 'melon' [seχχ] սեղիս. The more common rendition of this word is however [seχ] սեխ where there is no gemination.

The other pronounced fricative-fricative clusters are /fs, fʃ, χs/ (Table 4.46) which are all restricted to a handful of roots in *Kouyoumdjian*'s dictionary. From this set, only word [d̥zɑχs] 'cost' and its derivatives are frequent. The word 'star' can vary in pronunciation: <asdy> [astχ, asχ] 'star' աստղ (§4.4.2.2).

#### 4.3 Syllabification of final two-consonant clusters

Table 4.46: Final CC clusters where C1 is fricative and C2 is /s,ʃ/

				# of roots	# of derivatives
/ff/	‘dʒɑff	‘breast-plate’	ճալբ	n=1	n=0
/fs/	‘zefs	‘Zeus’	Զեւս	n=1	n=0
/χs/	‘dʒɑχs	‘cost’	ծախս	n=2	n=4
	‘tʰuχs	‘incubation’	թռխս		

On Armenian Wiktionary, we also found a handful of instances in non-dialectal words: [nɑfχ] ‘pattern’ նափխ, [kʰedən-soχs] ‘earth-crawling’ գետնսողս.

Based on the above data, it is obvious that fricative-fricative clusters are highly restricted in terms of a) what combinations are attested, and b) how many roots have these clusters. Because both of these factors are small, these post-fricative /ʃ, χ, s/ fricatives have been analyzed as being extrasyllabic appendixes *cite vaux*. Meaning that a word like [dʒɑχs] ‘cost’ doesn’t end in a genuine complex coda [χs], but that the syllable is [dʒɑχ] and the /s/ is added outside the syllable.

##### 4.3.3.10 Fricative + nasal /m/

The nasal /m/ has quite bizarre syllabification sometimes. As part of a complex coda, /m/+ fricative clusters are generally rare (§4.3.2.6). They are rare in that a) few words exist with an /m/+fricative cluster, and b) few of these existing words are high-frequency. In contrast, it is quite common to find words with a fricative + /m/ cluster (Table 4.47). And many of these words are high-frequency.

Table 4.47: Final CC clusters where C1 is fricative and C2 is a nasal /m/

				# of roots	# of derivatives
[zm]	‘gazm	‘construction’	կազմ	n=6	n = 39
	‘χazm	‘quarrel’	խազմ		
[hm]	‘dohm	‘family’	տոհմ	n=1	n=15
[ʁm]	‘hoʁm	‘wind’	հողմ	n=12	n=33
	‘goʁm	‘side’	կողմ		
	‘meʁm	‘soft’	մեղմ		
[ʃm]	tʰəʁoʃm	‘stamp’	դրոշմ	n=5	n=11
	[ɑʃm]	‘jade’	աշմ		

For /zm/, the *Kouyoumdjian* dictionary lists 6 roots that end in [zm]. Of these roots, the root [gazm] ‘construction’ was used to derive other words, specifically 39 compounds and prefixed words like [nor-a-gazm] ‘newly-formed’ նորակազմ

(literally ‘new+form’). Then there is a handful (n=5) of borrowings with the foreign suffix *-izm* like [fəʒiz**m**] ‘fascism’ ֆաշիզմ.

Note that for /zm/ clusters, some sources report schwa epenthesis **cite vaux**. For example, the word [gaz**m**] ‘construction’, the typical pronunciation is to not use a schwa. But Vaux reports a schwa form [gazə**m**]. It is possible that such a schwa is a transient vowel that’s created by going from [z] to [m].

For /hm/, only one root in the dictionary had this cluster: [doh**m**] ‘family’. All other words were compounds from this root like [azad-a-doh**m**] ‘noble’ ազատական **■** literally ‘free+family’.

For /xm/, we found 12 roots. Of that 12, [hox**m**] and [gox**m**] form all the derived words that have the /xm/ cluster: [vets-a-go**xm**] ‘hexagonal’ վեցական, literally ‘six+side’.

For /ʃm/, we found 5 roots. Of these roots, [tʰəro**ʃm**] formed all the derived forms with this cluster: [namag-a-tʰəro**ʃm**] ‘postage-stamp’ նամակադրոշմ, literally ‘letter+stamp’.

For /Vʒm/ words, we found no such cases. The closest was a <ayʒm> [əjʒə**m**] ‘now’ այժմ where the <ʒm> cluster is after a consonant. The fact that this word is pronounced as [əjʒə**m**] and not [əjəʒ**m**] suggests either that a) [ʒm] can’t be a complex coda or coda+appendix cluster, or b) schwa epenthesis avoids creating [jə] sequences if possible. Data is obviously too limited to know.

Besides the above words, we found only one case of orthographic final <sm> in the **Kouyoumdjian** dictionary: <tʃas**m**> ‘chimera’ ջասմ. This word is likely an old loanword. We’re not if a schwa is needed here: [tʃas(ə?)**m**]. Similarly we found one case of <vm>: <hrov**m**> ‘Rome’ հրովմ. We think the pronunciation is likely without a schwa before the nasal: [hərov**m**]. Part of the ambiguity is that these words seem like obvious loanwords and HD never heard of such clusters before. And finally, one case of <xm> is an obvious loanword without a schwa: <trax**m**> [tʰəɾax**m**] ‘Greek currency’ դրախմ.

In sum, fricative + /m/ clusters are pretty common. But we’re not sure why. The fact that only /m/ can form these clusters but not /n/ suggests that there is something special about the nasal /m/. **mention vaux**. We treat this /m/ as an extrasyllabic appendix in these words, though we’re not sure how Armenian came to develop this strange behavior. Furthermore, such fricative-nasal clusters show more idiosyncrasies word-medially (§4.5.2.1).

##### 4.3.3.11 Fricative + nasal /n/

Although word-final fricative + /m/ clusters are pronounced without an intervening schwa, word-final clusters of fricative + /n/ regularly undergo epenthesis



### 4.3 Syllabification of final two-consonant clusters

(Table 4.48).

Table 4.48: Schwa epenthesis in final CC clusters where C1 is a fricative and C2 is a nasal /n/

<vn>→[vən]	<goraliovn>	gorali'jovən	'coral'	կորալիո՞վն	n=3
<sn>→[sən]	<howsn>	'husən	'brink'	հոսն	n=27
	<orbēsnn>	vor'besən	'the wherefore'	որպէսն	n=26
<zn>→[zən]	<azn>	'azən	'nation'	ազն	n=36
	<t'akazn>	t <sup>h</sup> ak <sup>h</sup> azən	'prince'	թագազն	
<fn>→[fən]	<tafn>	'tafən	'contract'	դաշն	n=7
	<yankowfn>	haŋ'k <sup>h</sup> uʃən	'closely'	յանգուշն	
<zn>→[zən]	<aʒn>	'aʒən	'crack'	աժն	n=1
<xn>→[χən]	<toxnn>	t <sup>h</sup> oχən	'funnel'	դոխն	n=1
<yn>→[ɤən]	<sdeynn>	əs'teɤən	'dactyl'	ստեղն	n=17
	<eynn>	jeɤən	'hind'	եղն	

As with stop + /n/ clusters (§4.3.3.3), a lot of these fricative + /n/ words have an archaic connotation.

For <vn>→[vən] clusters, these seem to be restricted to loanwords. While <fn>→[fən] and <hn>→[hən] clusters seem to be accidental gaps.

#### 4.3.3.12 Fricative + rhotic /r/

Word-finally, an orthographic cluster of a fricative + rhotic /r/ undergoes schwa epenthesis (Table 4.49).

Table 4.49: Schwa epenthesis in final CC clusters where C1 is a fricative and C2 is a rhotic /r/

<wr>→[vər]	<awrr>→'avər	'bile'	աւր	n=1
<sr>→[sər]	<nōsrr>→'nosər	'coarse'	նօսր	n=6
<zr>→[zər]	<ezrr>→'jezər	'shore'	եզր	n=11
<z>→[zər]	<ʒahr>→'ʒaɦər	'virus'	ժահր	n=4
<xr>→[χər]	<d̪axrr>→'d̪aχər	'flight'	ճախր	n=3
<yrr>→[ɤər]	<d̪azayrr>→'d̪aɤər	'mocking'	ծաղր	n=9

For final <zr>→[zər] sequences, all of Kouyoumdjian's examples are either [jezər] 'shore' or its derivatives: [k<sup>h</sup>ed-ezər] 'river-bank' գետեզր where [k<sup>h</sup>əd] is 'river'.

#### 4 Syllable structure

For final <wr,vr>→[vər], more cases come from loanwords on Wiktionary: <manewr> → [mɑ'nevər] 'maneuver' մանևր.

These fricative-rhotic clusters are generally few. Thus in *Kouyoumdjian*, there are accidental gaps for the fricatives /f, ʃ/. On Wiktionary, we did find a loanword with [fər]: <ʃifr>→[ʃifər] 'cipher' շիֆր.

Prescriptively, all fricative-rhotic clusters are pronounced with a schwa: <meyr>→[mekər] 'honey' մեղր. But in casual speech, some of these words allow the deletion of the schwa: [mekr]. This is a case of schwa elision. In our experience, [kr] sequences often reduce to just [kr] in natural speech, while it is less common to see such reduction or schwa elision after the other fricatives.

##### 4.3.3.13 Fricative + lateral /l/

The *Kouyoumdjian* dictionary lists only one word that end in an orthographic cluster of a fricative + /l/. This word was <p'ahl> 'stallion' փաղ. This word is pronounced with a schwa: [pʰahəl].

On Wiktionary, we found some other cases from loanwords. These again take schwa epenthesis: <p'azl> [pʰazəl] 'puzzle' փազլ

##### 4.3.3.14 Nasal + nasal /m/

We did not find such final clusters in *Kouyoumdjian*. Nor did we find any such words on Wiktionary. However, there is a colloquial word that has this orthographic cluster and get a schwa: <dʒanm> → [dʒanəm] 'my dear' ճանմ. This word is borrowed from Turkish 'canım' [dʒanim 'my dear'.

##### 4.3.3.15 Nasal + nasal /n/

There are many words which end in an orthographic nasal-nasal sequence: <mn> and <nn>. In pronunciation, a schwa is added between the nasals (Table 4.50).

Table 4.50: Schwa epenthesis in final CC clusters where C1 is and C2 are nasals

Archaic suffix -umən		Other -mən		-nən
<xajt'owmn>	<derewowmn>	<adamn>	<owremn>	<inn>
/xajtʰ-umn/	/derev-umn/	/adamn/	/urumn/	/inn/
[xajtʰumən]	[derevumən]	[ɑ'damən]	[u'remən]	[inən]
խայթումն	տերեւումն	ատամն	ուրեմն	ինն
'pricking'	'foliation'	'tooth'	'thus'	'nine'
n=325		n=36		n=13

### 4.3 Syllabification of final two-consonant clusters

Words with a final <mn> [mən] cluster are generally archaic. One common situation are words that end in the nominalizer suffix [-um]. This suffix is pronounced [-um] in the modern language, with an orthographic final <m> ում. But in more archaic stages of Western Armenian, the form of this suffix [-umən] with an orthographic nasal cluster <mn> -նում. *Kouyoumdjian*'s dictionary uses these archaic forms, thus he has a lot of words that would be pronounced with a final [-umən].

#### 4.3.3.16 Nasal + rhotic /r/

Word-finally, nasal + /r/ clusters undergo schwa epenthesis. The nasal can be /m/ or /n/ (Table 4.51).

Table 4.51: Schwa epenthesis in final CC clusters where C1 is a nasal /m,n/ and C2 is a rhotic /r/

<mr>→[mər]	<hamr>	'hamər	'speechless'	համր	n=3
<nr>→[nər]	<manr>	'manər	'small'	մանր	n=5

I am not aware of cases where, in spoken speech, the [nər] cluster is reduced to \*[nər]: [manər] 'small', not \*[manr].

#### 4.3.3.17 Nasal + lateral /l/

Nasals cannot start a complex coda with laterals. We found no orthographic cases of final <ml> or <nl> clusters in *Kouyoumdjian*. On Wiktionary, the few examples that we found were all loanwords. And these get schwa epenthesis: <pʁanl> [pʰəranəl] բռնակ from French 'branle', and <greml> [gəreməl] 'Kremlin' Կրեմլ from Russian.

### 4.3.4 Geminate codas

There are few roots end in a geminate, i.e. roots where the final consonant is repeated. In *Kouyoumdjian*'s dictionary, we have found the following types of word-final repeated segments: [kk<sup>h</sup>], [χχ], and [rr]. Medial geminates are variably avoided (§4.5.2.6).

For [kk], this gemination is derived from adding the nominalizer /-k<sup>h</sup>/ after a velar stop: [hok-k<sup>h</sup>] 'hindrance' հոգք. This cluster is discussed in Section §4.3.3.1. This cluster is arguably syllabified as a coda + appendix, such as [.hok.{k<sup>h</sup>}]. Similar geminates are created in final [VCk-k] clusters via this appendix (§4.4.2.1).

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For [χχ], this cluster is limited to a handful of roots, some of which sound archaic: [seχχ] ‘melon’ սեղիւ. This cluster is part of a pattern where a final [χ] can be found in different fricative-fricative clusters, again as a type of extrasyllabic consonant. See Section §4.3.3.9.

Finally, the [rr] pattern is found in a handful of roots. This is orthographically represented with a final rhotic getting repeated: <rr> ըր. The [rr] sequence is pronounced as a single long rhotic. In HD’s impression, this orthographic <rr> sequence is pronounced as [rr] more often in Eastern Armenian than in Western Armenian. In his Western judgments, it feels more typical to degeminate this final cluster into just a singleton [r] (§3.6.5).

In *Kouyoumdjian*’s dictionary, we found 23 words which end in an <rr> [rr] sequence (Table 4.52). Of these 23 words, 4 are roots. The other words were all derived from the root [darr] ‘element’ (18 words) or [ant<sup>h</sup>orr] ‘peaceful’ (1 word).

Table 4.52: Final CC clusters where C1-C2 are geminate [rr]

‘darr	‘element’	տարր
an <sup>t<sup>h</sup></sup> orr	‘peaceful’	անդորր
‘jerr	‘mustiness’	էրր
‘dorr	‘turion’	տորր
‘medz + ‘darr	‘big + element’	մեծ տարր
→ medz-a-darr	‘spacious’	մեծատարր

Besides the above sequences of identical sounds, we’ve come across [zz] sequences in onomatopoeic words like [bəzz] ‘buzz’ պըզզ, [uff] ‘wow’ ուֆֆ. We’ve also found loanwords like [miss] ‘Miss’ միսս and [finn] ‘Finn’ ֆինն.

## 4.4 Syllabification of final three-consonant clusters

Armenian allows at most two consonants in a complex coda. Exceptions are rare and seem limited to non-nativized loanwords (§4.4.1). Among native words, if the orthography ends in a sequence of 3 consonants, then we see one of two outcomes:

- The cluster is a (complex) coda plus one or two appendixes (§4.4.2).
- The cluster is pronounced with schwa epenthesis (§4.4.3).

### 4.4.1 No native complex codas with three consonants

It seems that Armenian generally avoids words that have a complex coda larger than two consonants. The only example that we found in *Kouyoumdjian* was a

loanword [verst] ‘Verst’ վերստ, as the name for a Russian unit of length.

Armenian Wiktionary provides much more examples of words with final 3-consonant complex codas. Again, these are loanwords, especially proper nouns like [lisitʃansk] ‘Lysychansk’ Լիսիչանսկ or [tʰqjms] ‘The Times’ թայմս . Some Wiktionary loanwords even have flat-sonority: [atʰjungd] ‘adjunct’ ադյունկտ.

## 4.4.2 Codas with an appendix

A consonant is an appendix if it can be pronounced after a consonant cluster, despite having flat sonority (§4.2.3). Such appendixes are common in final two-consonant sequences (§4.3.3), but can also occur in final 3-consonant sequences. The set of possible final appendixes that we found in in 3-consonant clusters is /-k<sup>h</sup>, ɣ, s/. Very rarely, we find a cluster with two final appendixes /ɣ, k<sup>h</sup>/ (§4.4.2.4).

### 4.4.2.1 Complex coda + appendix /-k<sup>h</sup>/

The nominalizer suffix -k<sup>h</sup> can be added after virtually any attested complex coda (Table 4.53). In some cases, the sequence of three consonants has continuous falling sonority. This occurs when the second consonant is a rhotic, nasal, or fricative.

Table 4.53: Complex codas + appendix /-k<sup>h</sup>/ with continuous falling sonority

[VCl-k <sup>h</sup> ]	ʃɑˈrɑjɫ ʃɑˈrɑjɫ-k <sup>h</sup>	‘ray’ ‘glimmer’	շահայլ շահայլք	n=4
[VCr-k <sup>h</sup> ]	həˈrɑjɾ həˈrɑjɾ-k <sup>h</sup>	‘burned’ ‘conflagration’	հրայր հրայրք	n=12
[VCŋ-k <sup>h</sup> ]	pʰənɑˈtsɑjŋ pʰənɑˈtsɑjŋ-k <sup>h</sup>	‘onomatopoeia’ ‘onomatopoeia’	բնաձայն բնաձայնք	n=4
[VCs-k]	ˈbars ˈbars-k	‘Persian’ ‘Persia’	պարս Պարսք	n=6
[VCf-k]	ˈdujʒ ˈdujʃ-k	‘damage’ ‘damage’	տոյժ տոյժք	n=2

The suffix devices preceding fricatives: see the [VCf-k] row above (§3.3.7.4). The suffix tends to deaspirate after obstruents (§3.3.6.2).

Among falling-sonority clusters, the suffix can likewise follow the lateral /l/: see row [VCl-k<sup>h</sup>] in Table 4.53. As explained in Section §4.3.2.8, the lateral generally resists preceding a consonant in the same syllable, except for the suffix -k<sup>h</sup>.

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Although the appendix can create falling-sonority clusters, it is much more common to find flat-sonority clusters (Table 4.54). The suffix *-k<sup>h</sup>* can be easily added after a complex coda that ends in a stop or affricate of any place of articulation.

Table 4.54: Complex codas + appendix /-k<sup>h</sup>/ with flat sonority

[VCp-k]	otsa'gerb otsa'gerp-k	'snake-like' 'Ophidia'	օձակերպ օձակերպք	n=9
[VCt-k]	'girt <sup>h</sup> 'girt-k	'well-educated' 'instruction'	կիրթ կիրթք	n=39
[VCk-k]	'jerg 'jerk-k	'work' 'work of art'	երկ երկք	n=6
[VCts-k]	'hunts 'hunts-k	'harvest' 'harvest'	հունձ հունձք	n=34
[VCtʃ-k]	ɑ'nurtʃ ɑ'nurtʃ-k	'dream' 'dream'	անուրջ անուրջք	n=12

Among these final three-consonant clusters, there are cases where the suffix *-k<sup>h</sup>* follows another velar stop: see row [VCk-k] in Table 4.54. The two are pronounced as one long geminate.

On a last note, in *Kouyoumdjian*'s dictionary, we only found one case of a /VC-Ck<sup>h</sup>/ word that's pronounced with schwa epenthesis: <xaɾnk> [χaɾənk<sup>h</sup>] 'copulation' խառնք. Here, the schwa is necessary because [ɾn] is difficult to pronounce as a complex coda in general. See the other sections for variations on how [ɾn] clusters are produced, both word-finally (§4.3.2.7) and word-medially (§4.5.2.2).

##### 4.4.2.2 Complex coda + appendix /χ/

Among appendixes, the suffix *-k<sup>h</sup>* is the most common. Another common appendix is /χ/. This fricative can follow obstruents such as stops (§4.3.3.2) and fricatives (§4.3.3.9). It can likewise follow complex codas.

The only relevant example we came across in *Kouyoumdjian* is the word for 'star'. Orthographically, this word ends in a consonant cluster: <asdɣ> աստղ. In Eastern Armenian, this cluster undergoes schwa epenthesis: [astəɤ]. In some sub-dialects of Western Armenian such as in Istanbul, Istanbuli speakers tell us that this word is also pronounced with epenthesis: [astəɤ]. But in the Lebanese sub-dialect of Western Armenian, there is no schwa epenthesis. The cluster is pronounced either as [astχ] or with stop deletion [asχ].

For the [astχ] case, we analyze the [st] as forming a complex coda. The [χ] is then an appendix.

The word for ‘star’ has many derivatives (8 in *Kouyoumdjian*). Compounds that end with this root show the same patterns of pronunciation: [dzoˈv-astχ] ‘starfish’ ծովաստղ, literally ‘sea-star’.

#### 4.4.2.3 Complex coda + appendix /s/

Besides /k<sup>h</sup>χ/, another common appendix is /s/. This segment can follow stops (§4.3.3.2). It can likewise follow a complex coda that ends in a stop.

In *Kouyoumdjian*’s dictionary, we found three such cases. Two of them are alternate spellings of the loanword [əspɪŋks] ‘sphinx’ սփինքս, սփիկս. The other word is the name of some fish species [ɡarɑŋks] ‘Cavalla’ կարավալս.

Because we only found the above three examples, it’s possible that cases of complex codas + /s/ without schwa epenthesis are limited to either a) loanwords or b) words where the /s/ follows a velar stop [k]. Other clusters of consonants + /s/ undergo schwa epenthesis (§4.3.3.2, 4.3.3.7).

#### 4.4.2.4 Coda + two appendixes (χ, k<sup>h</sup>)

Interestingly, there are some words which have a sequence of a coda χ, plus an appendix χ, and then an appendix k<sup>h</sup>. Orthographically, the two χ sounds are spelled differently, suggesting their different origins (Table 4.55).

Table 4.55: Sequence of appendixes in final /χχk<sup>h</sup>/ clusters

<ayx>	‘aχχ	‘baggage’	աղխ
<ayxk’>	‘aχχ-k	‘closing’	աղխք
<owyx>	‘uχχ	‘torrent’	ուղխ
<owyxk’>	‘uχχ-k	‘torrent’	ուղխք

We only found two such words in *Kouyoumdjian* that had this final cluster.

#### 4.4.3 Schwa epenthesis in other word-final three-consonant clusters

Schwa epenthesis occurs for final clusters of two consonants that cannot be pronounced together (§4.3.24.3.3). We likewise see schwa epenthesis in certain final clusters of three consonants /VCCC#/ Such clusters are almost always syllabified with an epenthetic before the last consonant [VCCəC] and rarely with a schwa after the first consonant [VCəCC]. The final consonant is almost always a fricative

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or sonorant, and the preceding two-consonant cluster often has falling sonority. The reason for this is discussed in Section §4.2.4.

- /VCCs/ → [VCCəs] (§4.4.3.1)
- /VCCʁ/ → [VCCəʁ] (§4.4.3.2)
- /VCCm/ → [VCCəm] (§4.4.3.3)
- /VCCn/ → [VCCən], very rarely [VCəCn] (§4.4.3.4)
- /VCCr/ → [VCCər] (§4.4.3.5)
- /VCCl/ → [VCCəl] (§4.4.3.6)

### 4.4.3.1 Epenthesis before final /s/ in /VCCs/ clusters

There are very few words that end in an orthographic cluster of two consonants + /s/. Of the few words we found, these clusters undergo schwa epenthesis: <VCCs>→[VCCəs] (Table 4.56).

Table 4.56: Schwa epenthesis in final 3-consonant clusters with final /s/

<yns>→[jns]	<hzorakoyns> հզօրազոյնս	həzɔɾɑ'kujnəs 'powerfully'	n=12
<rk's>→[rkʰəs]	<nerk's> 'inside'	'nerkʰəs նէրքս	n=1

In the *Kouyoumdjian* dictionary, all the cases for the <yns>→[jns] cluster involved the final root [-kʰujnəs] -զոյնս which is used to create a type of adverbial superlative meaning.

Many more cases are found when the final /s/ is the 1sg possessive suffix. This suffixes always triggers a schwa after a consonant: <mart> [martʰ] 'man' մարդ vs. <marts> [martʰ-əs] 'my man' մարդս. This is discussed in *possessive schwa*

### 4.4.3.2 Epenthesis before final /ʁ/ in /VCCʁ/ cluster

There are very few words that end in an orthographic cluster of two consonants + /ʁ/. For most words, this cluster is pronounced with schwa epenthesis before the final sound: <VCCʁ>→[VCCəʁ]. The main exception is the word 'star' [ɑstχ] աստղ discussed in Section §4.2.2.

In the *Kouyoumdjian* dictionary, we found relatively few cases of such clusters (Table 4.57). Most of them display schwa epenthesis.



#### 4.4 Syllabification of final three-consonant clusters

Table 4.57: Schwa epenthesis in final 3-consonant clusters with final /ɤ/

<sdɣ>→[stəɤ]	<osdɣ>	'vostəɤ	'lime twig'	նստղ	n=1
<nkɣ>→[ŋk <sup>h</sup> əɤ]	<finkɣ>	'fɪŋk <sup>h</sup> əɤ	'snake cucumber'	շիկզղ	n=4
<ngɣ>→[ŋgəɤ]	<angɣ>	'aŋgəɤ	'angle'	անկղ	n=1
<rgɣ>→[rgəɤ]	<argɣ>	'aɾgəɤ	'box'	արկղ	n=7

Besides the above clusters, Armenian Wiktionary lists some non-dialectal words like <gowntsɣ> [guntsəɤ] 'clod' կոնձղ.

##### 4.4.3.3 Epenthesis before final /m/ in /VCCm/ clusters

Word-final orthographic clusters of two consonants + /m/ are rare. In *Kouyoumdjian*, we found only 3 examples (Table 4.58). These three examples all look morphologically or diachronically related to each other. Here we find schwa epenthesis.

Table 4.58: Schwa epenthesis in final 3-consonant clusters with final /m/

<ayzm>	'ajzəɤm	'now'	այԺմ
<aɾayzm>	aɾajzəɤm	'presently'	առայԺմ
<ts'ayzm>	tsajzəɤm	'till now'	ցայԺմ

Based on the above limited data, it seems that final /zm/ clusters just generally prefer epenthesis (cf. Section §4.3.3.10).

##### 4.4.3.4 Epenthesis before final /n/ in /VCCn/ clusters

There are many words that end in an orthographic cluster of two consonants plus the nasal /n/. In such words, schwa epenthesis is needed. In the most typical case, the schwa is added immediately before the nasal: <VCCn>→[VCCən]. For the two-consonant cluster, this cluster is almost always a cluster would have formed a complex coda, if only the nasal /n/ was absent. It is quite rare to find cases of epenthesis as <VCCn>→[VCəCn]

To illustrate, Table 4.59 organizes the set of final /CCn/ clusters that we found in *Kouyoumdjian*, based on the natural class of the CC cluster.

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Table 4.59: Schwa epenthesis in final 3-consonant clusters with final /n/ such that the preceding consonants could have formed a complex coda

fric. + affr. + /n/	<ta <sup>h</sup> yt <sup>h</sup> sn>	't <sup>h</sup> ax <sup>h</sup> tsən	'horsemint'	դադն	n=2
fric. + stop + /n/	<asgn>	'askən	'garnet'	ասկն	n=4
nasal + stop + /n/	<pangn>	'p <sup>h</sup> angən	'tale'	բանկն	n=14
nasal + affr. + /n/	<gownt <sup>h</sup> sn>	'gunt <sup>h</sup> sən	'clod'	կուծն	n=13
rhotic + obstr. + /n/	<artn>	'art <sup>h</sup> ən	'lance'	արդն	n=38
rhotic + /m/ + /n/	<sermn>	'sermən	'seed'	սերմն	n=6
glide + cons. + /n/	<toyzn>	't <sup>h</sup> ujzən	'frivolous'	դոյզն	n=5

For the words above, the pre-nasal consonant cluster would have formed a complex coda if the nasal was absent. For example, <towrk<sup>h</sup>n> [t<sup>h</sup>urk<sup>h</sup>ən] 'potter's wheel' դորկն vs. <t<sup>h</sup>owrk<sup>h</sup>> [t<sup>h</sup>urk<sup>h</sup>] 'Turk' թորք.

Besides the above words, there are also words where the pre-nasal cluster is flat or rising-sonority (Table 4.60). But in these clusters, the middle consonant would have formed an appendix if the nasal was absent. For example, word-final [ɐm] can form a syllabifiable cluster, whether we analyze the [m] as a coda or appendix. Adding a nasal /n/ after this cluster leads to schwa epenthesis.

Table 4.60: Schwa epenthesis in final 3-consonant clusters with final /n/ such that the preceding consonants could have formed a coda+appendix

<ɥmn>→[ɐmən]	<sa <sup>h</sup> ɥmn>	'sax <sup>h</sup> mən	'embryo'	սաղմն	n=9
	cf. <go <sup>h</sup> ɥm>	'go <sup>h</sup> ɐm	'side'	կողմ	
<ʃxn>→[ʃχən]	<sdaʃxn>	əs'taʃχən	'styrax tree'	ստաշխն	n=9
	cf. <pteʃx>	p <sup>h</sup> ə't <sup>h</sup> efχ	'mayor'	բդեշխ	

It is much more common for the pre-nasal cluster to have a syllabifiable cluster like <Vrtn> (cf. <Vrt>), then to have this cluster be some unsyllabifiable <Vkt<sup>h</sup>n> (cf. <Vkt>). I found virtually no such clusters in *Kouyoumdjian*. The closest example I found was the word <gozrn> ['gozərən] 'young came' կոզրն where the <VCCn> cluster is syllabified with a schwa after the first consonant [VCəCn] instead of before the nasal [VCCən]. The earlier location of the schwa is because [rn] is a licit complex coda, and schwa epenthesis tries to maximize the size of complex codas **cite schwa epenthesis**.

The relatively high number of falling-sonority clusters in before final /n/ is likely because of the diachronic origins of these clusters (§4.2.4).

## 4.4.3.5 Epenthesis before final /r/ in /VCCr/ clusters

There are many words which end in an orthographic cluster of two consonants plus the rhotic /r/. Here, the rule is that these clusters are syllabified with schwa epenthesis before the rhotic: <VCCr>→[VCCər]. There are some attested cases of variable schwa elision in these clusters.

In *Kouyoumdjian*'s dictionary, there were many cases of <VCCr> words (Table 4.61). Here, the preceding consonants almost always have falling sonority; if the rhotic was absent, then the cluster would have been a complex coda. But because the rhotic is present, we have schwa epenthesis.

Table 4.61: Schwa epenthesis in final 3-consonant clusters with final /r/ such that the preceding consonants could have formed a complex coda

fric. + stop + /r/	<koydr>	'k <sup>h</sup> oɾdər	'tender'	գողտր	n=60
fric. + affr. + /r/	<k'axts'r>	'k <sup>h</sup> axtsər	'sweet'	քաղցր	n=2
nasal + stop + /r/	<sandr>	'sandr	'comb'	սանտր	n=23
nasal + affr. + /r/	<t'antsr>	't <sup>h</sup> antsər	'thick'	թանձր	n=2
rhotic + obstr. + /r/	<t'antsr>	't <sup>h</sup> antsər	'tough'	կարծր	n=10
glide + cons. + /r/	<gaysr>	'gajsər	'emperor'	կարծր	n=2

As with <VCCn> clusters, the final rhotic is almost always found after a consonant cluster that could have been a complex coda. I have found only one exception in the *Kouyoumdjian* dictionary: an obvious loanword <magdr> [mɑgdər] 'mactra' մակտր.

## 4.4.3.6 Epenthesis before final /l/ in /VCCl/ clusters

There are vanishingly few words that end in an orthographic cluster of three consonants such that the final consonant is /l/: <VCCl>.

In *Kouyoumdjian*, we only found one example, and this example is a loanword with schwa epenthesis: <mankl> [mɑŋk<sup>h</sup>əl] 'mangle' մակլ.

On Armenian Wiktionary, we found more cases of this final consonant, and they behaved the same in terms of schwa epenthesis. Many of them were loanwords like <ansamp> [ansəmpəl] 'ensemble' անսամբլ. But some seemed like native words: <pangl> [p<sup>h</sup>ɑŋgəl] 'riddle' բանկլ.

## 4.4.3.7 Epenthesis in other types of VCCC clusters

In word-final 3-consonant clusters, the final consonant is almost always either an appendix /k<sup>h</sup>, s, χ/ or a consonant that triggers schwa epenthesis. For this second

group of schwa-inducing consonants, these consonants come from a restricted set /s, ʁ, m, n, r, l/. The reason is diachronic, as explained before in Section §4.2.4.

The *Kouyoumdjian* dictionary did not have any other final consonants that triggered schwa epenthesis in 3-consonant clusters. On Armenian Wiktionary, we found a handle of other possible final consonants that trigger epenthesis: <kovnt> [kʰovəntʰ] ‘type of circle-dance’ գովւոյ, and <eyrt> [jɛʁərtʰ] ‘type of willow’ եղրդ. For these words, the schwa creates a complex coda because schwa epenthesis generally prefers creating complex codas over simple codas \*jɛʁərtʰ.

Some are words from other dialects like ‘still’ աշտիս. We exclude them because they’re not Western Armenian, so we don’t know how they ‘should’ be pronounced anyway.

### 4.5 Other restrictions on complex codas

Besides the restrictions on falling sonority and appendixes, there are some minor restrictions on possible complex codas. These restrictions are the following:

1. Complex codas are generally infrequent word-medially, but still attested (§4.5.1).
2. Some complex codas are relatively easy to form word-finally, but difficult to form word-medially, or variably avoided word-medially (§4.5.2).
3. Some vowel-consonant combinations are generally avoided within the same syllable, specifically when the vowel is a high vowel or schwa (§4.5.3).
4. Some consonant clusters receive schwa epenthesis in careful speech, but they can be pronounced as clusters without schwas casual speech because of schwa elision (§4.5.3.2).

#### 4.5.1 Infrequency and asymmetry of word-internal complex codas

In general, Western Armenian allows word-internal complex codas. Thus, if some complex coda is attested word-finally, then it is in principle also possible word-initially and word-medially. For example, the plural suffix *-ner* can be added after any polysyllabic word, creating a complex coda: [mɑχ.tʰɑŋkʰ] ‘wish’ and [mɑχ.tʰɑŋkʰ-ner] ‘wishes’ մաղթանքներ. And for monosyllabic roots, we can add the sequence [n=e] ‘DEF=is’ on them: [mɑrtʰ] ‘man’ and [mɑrtʰ-n=e] ‘is the man’ մարդն է.

Furthermore, if some complex coda is banned or atypical word-finally then it also banned or atypical word-medially as well. For example, stop-stop complex codas like [gd] are generally avoided word-finally. Thus also word-medially, the

complex coda [gd] is avoided in native words. Loanwords unsurprisingly provide cases of [gd]: [e.legd.ron] ‘electron’ էլեկտրոն which can be resyllabified as [e.leg.dron], thus creating a complex onset and further signaling the non-native status of this word.

However, once we look at only uninflected words, it can be difficult to find such word-internal complex codas simply because of the following issues:

1. Word-medial complex codas are relatively rare in the lexicon.
2. Complex codas in roots tend to be root-final instead of root-initial.
3. Compounds tend to insert a vowel between the roots.
4. C-initial suffixes and CC-final prefixes are few.

For the first point on the general rarity of word-internal complex codas, Armenian Wiktionary (Jan 2021) has around 184,862 lexemes that have a listed syllabification. But of these 184K words, only 8,095 words started with a (C)VCC syllable, 2,834 had a listed word-medial CVCC, and 296 were reported with a medial VCC syllable.<sup>4</sup> These low numbers don’t mean that word-internal complex codas are impossible, just relatively rarer.

For the second point on roots, Although complex codas are allowed in the language, there are relatively few roots which contain a word-medial complex coda. Thus, it is difficult to find a root example for every possible complex coda. Some of the few examples are [hɑjd.ni] ‘clear’ յայտնի, [tʰɑrkʰ.man] ‘translator’ թարգման, and [bɑft.pan] ‘protector’ պաշտպան.

For the third point on compounds, when new words are created by adding derivational suffixes or by compounding, word-medial complex codas can be created: the compound [ɑjs-tʃɑp] ‘this much’ այսչափ made from the roots [ɑjs, tʃɑpʰ] ‘this, much.’ But it is much more common to include a linking vowel /-ɑ-/: [mar.tʰ, ser] ‘man, love’ մարդ, սէր create a compound [mar.tʰ-ɑ-ser] ‘philanthropist’ մարդասէր without a medial complex-coda.

For the fourth point on derivational morphology, there are a handful of derivational prefixoids that have complex codas: the prefixoid *antʰr-* անդր- is analogous to the English prefix *trans-*, such as [antʰ.r-ɑtʰ.land.jɑn] ‘trans-Atlantic’ անդրադաշտային. Another common example is the prefixoid [jerg-] ‘bi-, di-’ երկ- such as [jerg-dʒɛχk] ‘bifurcation’ երկճեղք derived from the word [dʒɛχk] ‘crack’ ճեղք.

However, even when we use derivational suffixes, it is relatively common for the complex coda to precede one of the following consonants: a rhotic /r/, a nasal /n/, glide /j/, a velar stop /g/ (often devoiced [k]). Each type of consonant often correlates with some morphophonological idiosyncrasy.

<sup>4</sup>These numbers can’t be fully trusted though because Armenian Wiktionary is rampant with syllabification errors.

#### 4 Syllable structure

For the rhotic, consider [vosk.r-qjin] ‘osseous’ նսկրայիս, derived from the root [voskor] ‘bone’ նսկոր with syncope of /o/ (see [syncope chapter](#)).

For the nasal, consider the word [əs.kəsp.n-a.'gan] ‘original’ սկզբնական, derived from [əski.sp] ‘beginning’ սկիզբ. The nasal is not part of the suffix /-agan/, but is a morphologically-epenthetic nasal due to a historic relic of nasal weakening (see [nasal liaison](#)).

For the glide /j/, there are three common derivational suffixes that start with a glide /j/: /jan, jag, jal, ja/ եան, եակ, եայ, եայ. For all these suffixes, we can optionally syllabify the glide with the preceding consonant: [zəm.ruχt.ja, [zəm.ruχ.tja] ‘made of emeralds’ զմրուխտայ from [zəm.ruχt] ‘emerald’ զմրուխտ. See Section §4.6.2.

And finally for the stop /g/, a common derivational suffixal is -ig: [tʰa.pʰan.ʔan.ig] ‘transparent’ թափանցիկ. This suffix can undergo further derivation and undergo vowel reduction, creating a complex coda: [tʰa.pʰanʔs.k-u.tʰjun] ‘transparency’ թափանցկութիւն. This suffix -ig is also used to form an irregular plural suffix for the word [martʰ] ‘person’ մարդ as [martʰ-ig] ‘people’ մարդիկ. This irregular plural can undergo derivational morphology, creating a complex coda: [mart.k-a.gan] ‘humane’ մարդկական.

To demonstrate these tendencies, we took the 2,834 Armenian Wiktionary which were listed as having a word-medial CVCC syllable. From this set, the majority (n=848, 29.92%) preceded the fricative /v/. This fricative was the passive suffix /v/ (spelled *ն* in the traditional orthography, *վ* in reformed). This suffix can follow complex codas in Eastern Armenian [ʃəɾɑjɭ-v-e-l] ‘to be wasted’ ջնայվել, but it triggers a schwa after CC clusters in Western Armenian [ʃəɾɑjɭə-v-i-l]. Thus this group is inadmissible in Western Armenian. After /v/, the other most common post-coda sounds were /ɾ/ ր (n=520, 18.35%), /n/ ն (n=341, 12.03%), /j/ յ (n=254, 8.96%), and /g/ կ (n=131, 4.62%). Besides these frequent consonants, we also found <b>ւ (n=77, 2.72%) but these were mostly due to the root [baft.pan] ‘protector’ պաշտպան.

Thus for medial CVCC syllables on Armenian Wiktionary, the above consonants accounted for over 75% of reported consonants that follow a complex coda in Eastern Armenian. The other 25% seemed like an arbitrary distribution of other consonants without any clear generalizations.

In sum, Armenian allows complex codas anywhere in the word. But there are some accidental asymmetries due to the structure of the Armenian lexicon and morphology.

### 4.5.2 Avoidance of certain word-medial complex codas

The previous section explained that essentially every possible word-final complex coda is also possible word-medially. But there are certain consonant clusters that are permitted word-finally, but seem to be avoided word-medially. These avoided clusters are grouped as the following. We go through each case below.

*cite these sections into the previous sections*

- /Cm/: /jm, ɾm, ʁm, zm, ʃm, hm/ (§4.5.2.1)
- /rɱ/ (§4.5.2.2)
- nasal-fricative: /ns, ms/ (§4.5.2.3)
- fricative-fricative: /χs, χʃ, ʃχ/ (§4.5.2.4)
- appendix /C-k<sup>h</sup>/ (§4.5.2.5)
- geminates (§4.5.2.6)

#### 4.5.2.1 Avoiding word-medial /Cm/ complex codas

Word-finally, /jm/ is a very rare cluster: [gɑjm] ‘mast’ (§4.3.1.7). Inflection with the definite suffix /-n/ can create a word-medial complex coda: [gɑjm-n=e] ‘must-DEF=is’ կայմն է. But we could not find any other cases word-medial [jm] complex coda.

Word-finally, /ɾm/ can form a complex coda as in [tʃɾm] ‘warm’ ջերմ (§4.3.1.6). But word-medially, it seems that this [ɾm] is almost always before a nasal /n/ or glide /j/: [tʃɾm.n-a.gɑn] ‘feverish’ ջերմնակա՛ն. Here the nasal is epenthetic because of an obscure morphological rule (see *nasal liaison*).<sup>5</sup> Exceptions are few, such as [ɑrm.dik<sup>h</sup>] ‘cereal’ արմտիք.

Further evidence for the above restriction comes from vowel reduction. There are a few roots which can create a [ɾm] complex coda when undergoing reduction: from [gɑr.mir] ‘red’ կարմիր to [gɑrm.ril] ‘to grow red’ կարմրիլ. But, for this root, it is impressionistically more common to have a schwa between the two consonants: [gɑr.mə.ril]. Similar reduction patterns are found for the root [marmin] ‘body’ մարմին but [marɾm.n-a.gɑn, mar.mə.n-a.gɑn] ‘corporeal’ մարմնակա՛ն. In HD’s impression, the schwa form is more common, while the schwaless form sounds higher register.

Word-finally, fricative + /m/ clusters are attested (§4.3.3.10), but each displays some idiosyncrasies word-medially.

The final cluster /ʁm/ can form a complex coda even though it has rising sonority: [goʁm] ‘side’ կողմ. It is possible to analyze this cluster as comprised of a coda

<sup>5</sup>In very few cases, we found root-final [ɾm] precede a glide, with possible resyllabification: [χɑrm.jɑ, χɑr.mjɑ] ‘fake jewel’ խարմեայ where /-ja/ is a derivational suffix.

and appendix. Word-medially, this coda can be created, but it seems to almost always precede either a nasal /n/ or glide /j/: [gɔ**ʁm**.n-agan] ‘lateral’ կողմնական due to an epenthetic nasal (), and [kʰar-a-gɔ**ʁm**-jan] quadrilateral բառակողմեան with possible resyllabification [kʰar-a-gɔ**ʁm**.mjən].

As before, this suggests that the medial complex coda [ʁm] has to before /n/ or /j/. Further evidence comes from vowel reduction. The root [aʁmug] ‘noise’ աղմուկ reduces to [aʁ**mæg**-e-l] ‘to disturb’ աղմկել. The high vowel is replaced by a schwa, and we can’t just delete the schwa to form \*aʁ**m**.gel. The avoidance of a schwa here is evidence that [ʁm] is an undesired complex coda before an obstruent like /g/.

For /ʃm/, this rising-sonority cluster is attested word-finally [tʰə.ɾɔʃ**m**] ‘stamp’ դրոշմ. However, word-medially, the only cases we could find involved adding /n/-initial inflection: [tʰə.ɾɔʃ**m**-ner] ‘stamps’ դրոշմեր. We couldn’t find clear cases of such clusters before derivational suffixes. Further, Kouyoumdjian only listed one word with an intervocalic /VʃmCV/ cluster, and this cluster gets schwa epenthesis in HD’s judgments: <gaʃmpowɪn> [gaʃ**m**puwən] ‘robust’ կաշմբուն, instead of \*gaʃ**m**.pʰurən.

For /zm/, this rising-sonority cluster can form a word-final complex coda: [ba.de.raz**m**] ‘war’ պատերազմ. It can become word-medial by adding the plural suffix -ner: [ba.de.raz**m**-ner] ‘wars’ պատերազմներ. Derivational suffixation again shows a tendency for a subsequent /j/: [ba.de.raz**m**.jan] ‘of war’ պատերազմեան, with possible resyllabification [ba.de.raz.mjan] (§4.6.2). In contrast, vowel reduction avoids creating this cluster: [χaz.muz] ‘must (n)’ խազմուզ derives [χaz.mə.z-atʃapʰ] ‘gleucometer’ խազմաչափ instead of \*χaz**m**.za.tʃap.

The other fricative-/m/ clusters also seem absent word-medially except before /n/-initial inflection. For example, medial /hm/ can be formed in [doh**m**-n=e] ‘family-DEF=is’ տոհմն է. But we could not find other word-medial case. And /sm/ is too rare even word-finally.

#### 4.5.2.2 Avoiding word-medial /rn/ complex codas

For /rn/, these cluster can be pronounced word-finally as a complex coda [tser**n**] ‘hand’ ձեռն. But schwa epenthesis is much more typical [tser**ən**] (§4.3.2.7. Word-medially before a consonant, epenthesis is the norm and (in HD’s judgment) the only possible pronunciation, such as in the derived word [tser**ən**-pʰeg] ‘one-handed’ ձեռնաբեկ. Schwa epenthesis in bound roots likewise avoids creating [rn] complex codas: <vrɪndel>→[və**rən**del] ‘to expel’ վռնել instead of \*və**rn**.del.



## 4.5.2.3 Avoiding word-medial nasal-fricative complex codas

For /ns/, this cluster is extremely rare word-finally. As surveyed in Section §4.3.2.6, final [ns] complex codas seem to be primarily loanwords like [finans] ‘finance’ ֆինանս. Word-medially, possible /VnsCV/ clusters arise via making compounds of the bound root /orens-/. Before C-initial suffixes or roots, this /ns/ cluster be pronounced with or without a schwa: [orens-tir, sorenəs-tir] ‘legislator’ օրէնսդիր. In HD’s judgment, the schwa form is much more typical in Western Armenian. VP informs us that the schwa-less form is however more common in Eastern Armenian. Thus, it seems that for Western Armenian at least, medial [ns] complex codas are dispreferred.

For /ms/, this cluster is relatively rare word-finally and it can form complex codas: [doms] ‘ticket’ տոմս. Inflection can also create a medial case: [doms-n=e] ‘ticket-DEF=is’ տոմսն է. This cluster is found word-medially for words that are derived from irregular root [amis] ‘month’ ամիս. Such as the genitive [ams-va] ‘month-GEN’ ամսուայ with an optional schwa [aməs-va]. Other cases seem to always involve adding a glide /j/ after the [ms] cluster: [amen-ams-ja] ‘monthly’ ամենամսեայ, and the /VmsjV/ cluster can syllabify as either [Vms.ja] or [Vm.sja].

## 4.5.2.4 Avoiding word-medial fricative-fricative clusters

For the fricative-fricative clusters like /fχ, χf, χs/. These clusters are rare word-finally, thus even rarer word-medially (§4.3.3.9). So it’s difficult to know whether their word-medial rarity is due to statistical change or something more. Some of the examples that we found are [əmp<sup>h</sup>oʃχnel] ‘to savor’ ըմբռնել, [baχʃkil] ‘to be refreshed’ պարզկիլ, [t<sup>h</sup>əχs.mɑjɾ] ‘brooding hen’ թխսմայր.

4.5.2.5 Avoiding word-medial /C-k<sup>h</sup>/ appendixes

For /C-k<sup>h</sup>/, as said many times, the nominalizer suffix -k<sup>h</sup> can be added after any consonant cluster.

For example, consider a polysyllabic word like the verb [daradz-el] ‘to spread’ տարածել. We can derive the noun [darats-k] ‘spread’ տարածք. The appendix *k* can be made word-medial by adding an inflectional suffix: [darats-k-ner] ‘spread-PL’ տարածքներ.

**cite vaux dolation**

However, the morphology generally avoids placing this suffix between a consonant-final and a consonant-initial derivational suffix morphology. For example, the root [mud] ‘entry (archaic)’ մուտ has a more common form as [mut-k] ‘entry’

մուտք with the nominalizer. It can be preceded by C-initial inflection like [mut-k-n=e] ‘entry-DEF-is’ մուտքն է. The root ‘entry’ [mut-k] can also be used in compounds like [arev-mut-k] ‘West’ արեւմուտք where [arev] means ‘sun’.

The adjective ‘Western’ however is formed by deleting the  $k^h$ , adding *-jan*, and reducing the root vowel: [arev-məd-jan] ‘Western’ արեւմտեան. Because of this apparent avoidance stem-medial  $-k^h$ , most analyses of the appendix  $-k^h$  argue that this suffix must be at the end of the word before inflection. I have only found a handful of counter-examples: [arev-mut-k-tsi] ‘Westerner’ արեւմուտքցի.

### 4.5.2.6 Avoiding word-medial geminate complex codas

For geminates, because geminate codas are extremely rare word-finally, it’s not surprising that they are rarer word-medially. The main example that we found is in the derivatives of the word [mər.rig] ‘tempest’ մրրիկ which form geminate codas: [mər.r̥.gɑ.jin] ‘turbulent’ մրրկալիւ. However, HD reports that it’s also common to remove this medial geminate by either degemination or by using a schwa: [mər.gɑ.jin, mər.r̥.gɑ.jin]. This suggests that word-medial geminates are somewhat avoided word-medially.

### 4.5.3 Vowel-based or consonant-based restrictions on codas and complex codas

For virtually any pair of vowels and consonants, we can create a coda or complex coda. But, there are some restrictions for glides and /i,u/ (§4.5.3.1). There are more restrictions for the schwa /ə/ (§4.5.3.2). And the front vowel /ɛ/ simply always takes a coda when in the final syllable (§3.2.3).

#### 4.5.3.1 Restrictions on /j/ and /v/ codas

The consonants /j/ and /v/ are relatively common codas in Armenian. But they have various restrictions on what types of vowels they can follow.

First, in word-final complex codas like /VjC/, the glide only follows /ɑ/ or /u/ in native words. For example, in Kouyoumdjian (1970)’s dictionary, we found 703 words with final /ɑjC/ like [lɑjn] ‘wide’ լայն, and 1272 words with final /ujC/ like d [k<sup>h</sup>ujn] ‘color’ գոյն; see more examples in Section §4.3.1.7.

The only other vowel that we found in Kouyoumdjian (1970) was /e/ in a single loanword: [k<sup>h</sup>emp<sup>h</sup>ejn] ‘campaign’ քէմփէյն. Wiktionary had more cases of loanwords with /ej/. Wiktionary also had some examples of final /əj,oj/, but these were all non-Western words or loanwords like [kazojl] ‘gas oil’ գազոյլ.

#### 4.5 Other restrictions on complex codas

Second, word-final simplex codas like /Vj/ are generally rare (Table 4.62). In the *Kouyoumdjian* (1970) dictionary, there are many words (n=958) that are spelled with a final glide <y> j; but most such cases involve a silent unpronounced glide like <ḏarāy> [ḏara] ‘servant’ ḏunawj. After factoring out silent glides, we found only 62 words with a final glide coda. These have either /ɑ, e, o/.

Table 4.62: Restriction on word-final /j/ codas

/ɑj/	'hɑj	'Armenian'	հայ	n=41
	rusɑ'hɑj	'Russian-Armenian'	ռուսահայ	
	'p <sup>h</sup> ɑj	'verb' ,	բայ	
/ej/	't <sup>h</sup> ej	'tea'	թէյ	n=2
	'bej	'bey'	պէյ	
/oj/	'k <sup>h</sup> oj	'existent'	գոյ	n=19
	'χoj	'ram'	խոյ	
	iŋk <sup>h</sup> na'k <sup>h</sup> oj	'self-existent'	ինքնագոյ	

For /uj/, this vowel+coda sequence is unattested word-finally in *Kouyoumdjian* (1970). On Wiktionary, we found a handful of /uj/-final words in loanwords and interjections, such [uj] ‘ouch’ ոյ. Word-medially, /uj/ can be easily derived via resyllabification. For example, /u/ can be used with /j/ as in [k<sup>h</sup>ujn] ‘color’ գոյն but [k<sup>h</sup>uj.ner] ‘colors’ գոյներ.

Third, /ij/ seems to be rare even as a word-medial syllable. For example in the *Kouyoumdjian* dictionary, there is only one such word that has a syllable ending in /ij/: [ij.nal] ‘to fall’ իյնալ. This is a high-frequency irregular verb. However, in HD’s judgment, it’s also common to pronounce this word as just [i.nal] without a glide.

Wiktionary listed only a handful of other examples of [(C)ij] syllables, but these were all either obscure dialectal words, or loanwords like [novorosijsk] ‘Novorossiysk’ նովորոսիյսկ.

Fourth, alongside /ij/, a similar restriction seems to be that /uv/ codas are rare or banned (Table 4.63). We couldn’t find any such cases in *Kouyoumdjian*. On Wiktionary, the handful of examples we found were either obscure dialectal words, or loanwords like [ve.zuv] ‘Vesuvius’ վեզուվ. In contrast, *Kouyoumdjian* (1970) had many word-final /v/ codas for other vowels.

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Table 4.63: Restriction on word-final /v/ codas

/av/	'h <b>av</b> p <sup>h</sup> ə' <b>nav</b>	'chicken' 'never'	հաւ քնաւ	n= 410
/ev/	t <b>sev</b> a' <b>rev</b>	'form' 'sun'	ծել արել	n=426
/ov/	'd <b>zov</b> ʒo' <b>kov</b>	'sea' 'meeting'	ծով ժողով	n=144
/iv/	't <sup>h</sup> <b>iv</b> ba' <b>div</b>	'number' 'honor'	պատիւ պատիւ	n=155

It is likely that the reason why /ij, uv/ codas are generally banned is because the vowel and coda would be too similar. The glide /j/ is phonologically a consonant-form of /i/. As for /v/, Armenian does not have a productive /w/ phoneme, so /v/ is the most similar consonant form of /u/. Such similarities for /i/-/j/ and /u/-/v/ are also found in vowel hiatus repair (§4.7).

Although [ij] and [uv] codas are generally banned, it is possible to have [i.jV] and [u.vV] sequences. That is, the sequence /ij/ can be formed as long as the glide is part of the next syllable: [k<sup>h</sup>ini-ji] 'wine-GEN' գինիի. Such a sequence is easily created because the regular genitive suffix is *-i*.

Similarly for /uv/, such sequences are attested when the /v/ is part of the next syllable: [ve.ru.var] 'up' վերով. Though it seems that even [u.v] sequences are rather infrequent.

And although /ij/ and /uv/ are generally avoided as codas, it is quite easy to form /ji/ and /vu/ syllables. For /ji/, this syllable is easily created when the genitive suffix /i/ triggers glide epenthesis after a vowel: [dʒara-ji] 'servant-GEN' ծառայի. The /vu/ sequence is easily made when the productive nominalizer /-um/ is added after a /v/-final root: [χorov-um] 'roasting' խորովում. Furthermore, the sequences /iv/ and /uj/ are also easily found codas: [t<sup>h</sup>iv] 'number' թիւ, [zujk<sup>h</sup>] 'twin' զոյգ.

##### 4.5.3.2 Restrictions on codas for schwas

The schwa is a common vowel in Armenian and it can have virtually any type of coda or complex coda. But there are some restrictions involving a) glide codas (§4.5.3.2.1, b) rhotic-fricative complex codas (§4.5.3.2.2), and c) rhotic-nasal complex codas (§4.5.3.2.3).

## 4.5.3.2.1 Schwas avoid glide codas

First, it seems that the schwa cannot have a glide /j/ coda. We could not find any examples /əj/ syllables in *Kouyoumdjian*. As for Wiktionary, we did find a handful of examples but these were all obscure dialectal words that don't exist in Western Armenian.

Furthermore, it seems that even the sequence /əj/ is banned regardless of syllable structure. That is, it is very rare to find a word where a schwa precedes a glide /j/. The closest examples we could find were atypical colloquial pronunciations of word-initial [CɹC] (§3.2.3). Very rarely, a [CɹC] word like *like* [kʰɪʁ] ‘village’ Գիւղ can be pronounced as [CəjuC] or [CəjɹC]: [kʰə.juʁ, kʰə.jɪʁ].

Note that although /əj/ is a rare sequence, the sequence /jə/ is quite common. This is because the definite suffix is -ə after glide-final roots: [pʰəj-ə] ‘verb-DEF’ բայը.

## 4.5.3.2.2 Schwas avoid rhotic-fricative codas

Second, it seems that the schwa avoids having a rhotic-fricative complex coda like [ərs], [ərf], and so on. The evidence comes mainly from schwa epenthesis. Data is summarized in Table 4.64.

Table 4.64: Avoidance of schwa-rhotic-fricative syllables

<CrsC> →[Cə.rəs.C]	<bɾsdel> <t'ɾsnel>	bə.rəs.tel tʰə.rəs.nel	*bərs.tel *tʰərs.nel	‘to wrinkle’ ‘to soften’	պռստել թռսկել
<CrɸC> →[Cə.rəɸ.C]	<p'ɾɸdal> <t'ɾɸnel>	pʰə.rəɸ.tal tʰə.rəɸ.nel	*pʰəɸ.tal *tʰəɸ.nel	‘to sneeze’ ‘to wither’	փռշտալ թռշնել
<CrɣC> →[Cə.rəɣ.C]	<tʃɾɣgal> <t'ɾɣgal>	tʃə.rəɣ.kal tʰə.rəɣ.kal	*tʃəɾɣ.kal *tʰəɾɣ.kal	‘to clatter’ ‘to rattle’	չրիսկալ թրիսկալ

For [ərs], the orthography provides few words where we have a /CrsC/ cluster that would need schwa epenthesis. In these few cases, the schwa is added between the /rs/ cluster: <sɾsgel> [sə.rəs.kel] ‘to sprinkle’ սրսկել. If an [ərs] complex coda was easily allowed, then we would incorrectly expect \*sərs.kel, cf. [hərs.nikʰ] ‘wedding’ հարսնիք.

Similar behavior is found for [ərf]: <p'ɾɸni> [pʰə.rəɸ.ni] ‘type of tree’, cf. [gəɾɸ.nəkʰ] ‘sinewy’ կարշնել. And for [əɾɣ]: <trɣgots> [tʰə.rəɣ.kots] ‘gunshot’ դրիսկոց, cf. [məɾɣ] ‘resinous pine’ մարի.

For the other orthographic combinations of consonant + rhotic + fricative combinations, these clusters were either absent or astonishingly rare in dictionaries.

#### 4 Syllable structure

We could find suitable examples to see how they would be pronounced in Western Armenian.

Note that although the general behavior is for a schwa /ə/ to avoid getting a rhotic-fricative complex codas, such syllables do occur in special morphologically-induced circumstances. Consider the word [tʰurs] ‘outside’ դուրս. Before a vowel-initial derivational suffix, the root’s high vowel is reduced to a schwa: [tʰər.s-e.tsi] ‘foreigner’ դրսեցի. In very rare cases, a nasal is inserted after this root: [tʰərs.n-aɡan] ‘exterior’ դրսնական. In such derivatives, the morphology allows a [ərs] syllable to maintain similarity with the root [tʰurs], and to avoid a non-similar output like \*tʰə.rəs.na.ɡan.<sup>6</sup>

If we look beyond Western Armenian and into Eastern Armenian, we find similar analogical effects happen in passivization **passive chapter**. In both dialects, the passive stem tends to be phonologically identical to the active stem. In Western Armenian, the passive suffix /v/ cannot follow any complex coda, so it triggers a schwa whether after any rhotic-fricative cluster: [tʰər.ʒ-e-l] ‘to infringe’ դրժել but passive [tʰər.ʒə-v-i-l] ‘to be infringed’ դրժուիլ, cf. [marz-e-l] ‘to exercise’ մարզել and passive [mar.zə-v-i-l] ‘to be exercised’ մարզուիլ.

But in Eastern Armenian, the passive /v/ can follow complex codas: [marz.-v-e-l] մարզվել, and it can follow [ərF] syllables: [dərʒ.-v-e-l] դրժվել. The passive data thus shows that schwas generally avoid having a rhotic-fricative complex coda, unless there is a morphological pressure to maintain identity of roots.

##### 4.5.3.2.3 Schwas avoid word-medial rhotic-nasal codas

Because of how the morphology of Armenian works, the orthography creates consonant + rhotic + fricative clusters word-medially, not word-finally. Thus, although word-medial [ərs] complex codas are banned, it is unknown whether these clusters are fine word-finally. This ambiguity is absent for word-medial rhotic-nasal complex codas, summarized in Table 4.65.

Table 4.65: Avoidance of word-medial schwa-rhotic-nasal syllables

<CrnC> →[Cə.rəm.C]	<krmp'al> <xrmp'ets'>	kʰə.rəm.pʰal χə.rəm.pʰots	*kʰərm.pʰal *χərm.pʰots	‘to thump’ ‘snore’	գրմփալ խռմփոց
<CrnC> →[Cə.rən.C]	<zrnkal> <hrintʃ'el>	zə.rən.kʰal hə.rən.tʃel	*zərn.kʰal *hərn.tʃel	‘to tinkle’ ‘to snort’	զրնգալ հռնչել

<sup>6</sup>This need for similarity of roots does show some variation. For example [mər.s-i-l] ‘to feel cold’ մրսիլ and its derivative [mərs.-kod, mə.rəs.-kod] ‘chilly’ մրսկոտ.

Interestingly, although the schwa can't have a rhotic-fricative complex coda, it can have a word-final /rɲ/ complex coda : [go.zəɲ] 'young camel' կոզն. But word-medially, such complex codas are generally avoided for all types of vowels: <arɲtʰagan> [ɑ.rɲ.tʰɑ.'gɑn] 'relative' առնչական (§4.5.2.2). Schwas also avoid this complex coda word-medially: <prɲgil> [pʰə.rɲ.gil] 'to be inflamed' բռնկիլ.

For /rɲ/, this cluster can be formed word-medially for non-schwa vowels, but with various restrictive tendencies (§4.5.2.1). For the schwa, it seems that it cannot have a /rɲ/ complex: <xrɲp'al> [χə.rɲm.pʰɑl] 'to snore' խռմփալ.

#### 4.5.4 Complex codas created by schwa elision

write after schwa elision abstamp

## 4.6 Complex onset restrictions

The typical syllable in Armenian can be described as CVC or CVCC without a complex onset (§4.2.1). However, in principle, Armenian does creating complex onsets. But the possible types of complex onsets are significantly restricted and they can categorized as one of the following:

1. consonant + glide sequences that are formed word-initially (§4.6.1)
2. consonant + glide sequences that are formed word-medially but with variable resyllabification (§4.6.2)
3. consonant-consonant clusters that typically get a schwa [CəCV] but can lose the schwa in casual speech from schwa elision [CCV] (§4.6.3)

Another category are consonant + sonorant sequences from non-nativized loanwords. For example, the name <k'lara> [kʰlɑɾɑ] 'Clara' Քլարա or the word <gram> [gɾɑm] 'gram' կրամ. However, such loanwords can be nativized by adding a schwa: [kʰələɾɑ, gɾɑm]. We don't discuss such loanwords further because they are quite limited.

### 4.6.1 Complex onsets of consonant + glide

Grammars often report that the only acceptable 'normal' complex onset is a consonant + glide /j/ combination, such as [gjaŋkʰ] 'life' կեանք. However, although such complex codas exist, they are significantly restricted in their distribution. These restrictions involve the following asymmetries:

1. Few word-initial /Cj/ sequences.
2. /Cj/ is restricted to being almost always before /a//

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##### 3. Variation in how word-medial /Cj/ clusters are syllabified.

First, word-initially, such [Cj] clusters are limited to a handful of roots (Table 4.66). The *Kouyoumdjian* dictionary listed 12 roots that start with a [CjV] sequence. We list these roots below.

Table 4.66: Word-initial [Cj] complex onsets

'gjal	'to exist'	կեալ	'ռjag	'rudder'	ղեակ
'sjav	'black'	սեալ	'k <sup>h</sup> jar	'necklace'	քեառ
'ljart <sup>h</sup>	'liver'	լեարդ	'gjar <sup>h</sup> k <sup>h</sup>	'life'	կեանք
'njart <sup>h</sup>	'fibre'	նեարդ	'djark <sup>h</sup>	'gentlemen'	տեարք
'sjamk <sup>h</sup>	'threshold'	սեամք	'sjamk <sup>h</sup>	'threshold'	սեամք
'ljarən	'mountain'	լեառն	'djarən	'of the Lord'	տեառն
'zjan	'pain'	զեան			

5 of these roots are then used to form 39 derivatives, such as [njart<sup>h</sup>-avor] 'fibrilous' նեարդաւոր. The total number of [CjV] words ends up as just 49 words (12 roots and 39 derivatives).

Second, as is visible above, these word-initial [CjV] clusters are limited to cases where the vowel is /a/. For the other vowels, there are some variable cases of [Cju] clusters. Some roots like [k<sup>h</sup>ʏʁ] 'village' գիւղ have a front-round vowel [ʏ] that can optionally be pronounced as [ju], as in [k<sup>h</sup>juʁ]. This is discussed in Section §3.2.3.<sup>7</sup>

Another exceptional case is the archaic word մեօկաճերս <meōk'agerb> 'similar to us'. As an orthographic rule, the sequence եօ <ōk> is supposed to be pronounced as [jo]. For this word, the default pronunciation is thus [mjok<sup>h</sup>agerb] with a [Cj] complex onset. But HD feels that because this word is low-frequency (and previously unknown to him), then this word can also be pronounced as [mejok<sup>h</sup>agerb] with glide epenthesis.

In fact, it seems that in Western Armenian, the [Cj] complex onset must always precede either a /a/ (in the usual case) or a /u, o/ (in rare cases). We examined Armenian Wiktionary, and we confirmed this generalization. Armenian Wiktionary did report a handful of words that with [Cj] and other vowels. But these counter-examples are either obvious loanwords like [gʝorliŋk<sup>h</sup>] (WA), [kʝorliŋg] (EA) 'curling' կյորլիկ, or dialectal words that don't genuinely exist in Western Armenian.

<sup>7</sup>However, Armenian dialects do vary in how often they have [Cj] complex onsets. The Western Armenian [ʏ] vowel corresponds to a [ju] sequence in Eastern Armenian. Does a Western word like [աժքյր] 'fountain' աղբիւր is pronounced as [աժքյւր] in Eastern Armenian. Eastern Armenian thus has significantly more cases of [Cj] complex onsets than Western Armenian.



Third, even though [Cj] complex onsets are permitted in Western Armenian, these clusters are dispreferred word-medially (Table 4.67). Specifically, if a /Cj/ cluster is intervocalic, then the /Cj/ cluster can be pronounced either as a complex onset [V.CjV] or into separate syllables [VC.jV]. For example, most word-medial cases of [Cj] are due to adding one of the following derivational suffixes: /jan, jag, jal, ja/. Each of these suffixes allow resyllabification. This variation is discussed in more depth in Section §4.6.2.

Table 4.67: Variation in re-syllabification for /j/-initial suffixes

/jan/	a.t <sup>h</sup> a.man.t <sup>h</sup> jan	‘diamond-encrusted’	cf. a.t <sup>h</sup> a.man <sup>h</sup>	‘diamond’
	a.t <sup>h</sup> a.man <sup>h</sup> .jan	ադամանդեան		ադամանդ
/jal/	ʃef.t <sup>h</sup> jal	‘accented’	cf. ʃeft	‘stress’
	ʃeft.jal	շեշտեալ		արբած
/ja/	p <sup>h</sup> aj.dja	‘wooden’	cf. ʔajd	‘wood’
	p <sup>h</sup> ajd.ja	փայտեայ		փայտ
/jag/	de.ʔjag	‘well-informed’	cf. ʔex	‘place’
	deʔ.jag	տեղեակ		տեղ

In sum, even though [Cj] complex onsets are allowed, they seem to be either a marginal or restricted part of the language, such that the language has strategies to avoid pronouncing the [Cj] onsets.

#### 4.6.2 Variation in syllabifying word-medial consonant-glide clusters

Armenian generally avoids all complex onsets except for /Cj/ sequences. However, there is significant free variation in how easily or how often [Cj] complex onsets are formed.

Word-initially, a [Cj] complex onset generally cannot alternate with other forms. Thus a word like [gjan<sup>k</sup>] ‘life’ կեանք is pronounced only with a [Cj] complex onset. But there are a few words which show free variation such that [Cj] is replaced by [Cij]: [ljart ~ lijart<sup>h</sup>] ‘liver’ լեարդ.

Word-medially, we find much more free variation. This variation is correlated with the following parameters:

- Whether the /Cj/ follows a vowel /VCjV/ or consonant /VCCjV/.
- If the pre-/j/ consonants in /VCCjV/ form a falling-sonority complex coda.
- If the pre-/j/ consonants is two consonants or more /V(C)CCjV/.
- Orthographic rules for pronouncing [Cj] for different words.
- Preferences for or against [Cj] by certain suffixes.

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We go through the various parameters, summarized in Table 4.68.

Table 4.68: Variation in syllabifying word-medially /Cj/ clusters

[V.CjV~VC.jV]	gə.'rja he.k <sup>h</sup> ja <sup>h</sup>	gər.'ja hek <sup>h</sup> .ja <sup>h</sup>	‘turtle’ ‘fable’	կրիայ հէքեայթ
[VC.CjV~VCC.jV]	p <sup>h</sup> ər.'t <sup>h</sup> ja ux'.tjal	p <sup>h</sup> ər <sup>h</sup> .ja ux <sup>h</sup> .jal	‘woolen’ ‘votive’	բրդեայ ուխտեայ
[VC.CjV, *VCC.jV]	əs.tor.ak <sup>h</sup> .rjal jot <sup>h</sup> .njag	*əs.tor.ak <sup>h</sup> r.jal *jot <sup>h</sup> n.jag	‘undersigned’ ‘septet’	ստորագրեայ եօթնեակ
[VCC.CjV, *VCCC.jV]	vosp.nja jerg.goxm.nja	*vospn.ja *jerg.goxmn.ja	‘freckled’ ‘bilateral’	ոսպնեայ երկկողմեայ
[V(C)C.rjV, *V(C)Cr.jV] or [V(C).Cər.jV]	sand.rja san.dər.ja vosk.rja vos.kər.ja mez.rjal me.ʒər.ja	*sandr.ja *voskr.ja *mezr.ja	‘pectinal’ ‘bony’ ‘honeyed’	սանկրեայ ոսկրեայ մեղրեայ

First, consider the intervocalic parameter. In /VCjV/ sequences, the /Cj/ can form either a complex onset or be in different syllables: [sen.jag] or [se.njag] ‘room’ տնեայ. The choice of syllabification is partially just free variation, but there is some correlation with dialect. In our experience, Eastern Armenian speakers are more likely to use [V.CjV] than [VC.jV], while Western Armenian speakers are more likely to use [V.CjV].

Second, if the /Cj/ precedes a consonant, then resyllabification is possible if the preceding consonant cluster can form a complex coda: [ban.djal ~ band.ja] ‘prisoner’ բանտեայ. But if the preceding consonant cluster can’t form complex codas in the language, then we don’t have resyllabification: [lus.njag] but not \*lusn.jag ‘lunatic’ լուսնեայ.

Note that the preceding cluster can even be complex coda that arguably includes an extrasyllabic appendix (§4.2.3). For example, word-final [ks] clusters are attested and they’re arguably comprised of an appendix -s. These structures can be formed via /Cj/ resyllabification: [me.dak.sja ~ me.daks.ja] ‘silken’ մետաքսեայ

Third, when the /j/ follows three consonants, then the default pronunciation is to create the [Cj] complex onset: [hars.njag] ‘chrysalis’ հարսնեայ. The three consonants cannot form a complex coda because 3-consonant codas are generally banned in Armenian: \*harsn.jag (§4.2.4).

An interesting type of variation occurs when the glide /j/ follows a /(C)Cr/ cluster. Here, the prescriptive pronunciation is to create a complex onset: [a.ʒek.sand.rjan] ‘Alexandrine’ աղէքսանդրեան. Resyllabification with a 3-consonant coda is at

best odd to hear: \**a.ʁek.sandr.ja*. However, in casual speech, HD has observed that some speakers (including himself) can epenthesize a schwa before the /r/ for at least some of these: [a.ʁek.sən.dər.ʝən].

This sub-pattern of pre-rhotic schwas can interact with vowel reduction. Consider the root [əndir] ‘chosen’ ընտիր. Adding a suffix /-jal/ causes the vowel to reduce to zero in the prescriptive form: [ənd.rjal] ‘elected’ ընտրեալ. Resyllabification is of course impossible: \**andr.jal*. However in colloquial speech, a schwa can occur before the /r/: [ən.dərjal]. Other examples include deriving [tʃa.mitʃ] ‘raisin’ չամիչ to [tʃam.tʃja, tʃa.mətʃ.ja] ‘plum cake’ չամչեայ but not \**tʃamtʃ.ja*. It’s unclear if these schwas here are epenthetic or a reduced form of the root high vowel.

Another sub-variation is that in colloquial speech, it is possible to sometimes change a /CCjV/ form into [CCijV]. For example, [das.njag] ‘decade’ տասնեակ can be pronounced as [das.ni.jag]. Data is too limited to make any concrete generalizations on such variation. But HD suspects that it’s relatively common when the /j/ is part of a suffix that follows a rising-sonority consonant sequence.

Fourth, the traditional orthography for Armenian has rather opaque rules on how to spell [Cj] clusters. The orthographic cluster Իա <ia> is found inside various roots and suffixes. When this vowel sequence is after the word-initial consonant, the sequence is pronounced with glide epenthesis: <diar> [dijar] ‘mister’ տիար. But after a word-medial consonant, some cases of <ia> are pronounced strictly as [ja] like <maria> [mar.jam] ‘Mariam’ Մարիամ,<sup>8</sup> some can show variation between [ja] and [ija]: <tasdiarag> [tʰastijarag, tʰastjarag] ‘educator’ դաստիարակ, and some always take [ija]: <badriark> [badrijarkʰ] պատրիարք. Thus, certain roots seem to idiosyncratically ban or allow [Cj].

Fifth, some suffixes seem to have individual preferences for whether they allow [Cj] complex onsets or not. Consider the nominalizer suffix /-utʰyn/ -ութիւն. This suffix has many possible pronunciations, such with replacing /x/ with a glide-vowel sequence: [-utʰjun] (§3.5.1). One pronunciation is to create a [Cj] sequence as a complex onset: [urax-u.tʰjun] ‘happiness’ ուրախութիւն. But it’s also possible to make the /Cj/ sequence be in separate syllables: [urax-utʰ.jun]. In HD’s judgment, the complex onset [Cj] form feels more natural than [C.j].

This morpheme-specific behavior can interact with the other parameters for /j/-resyllabification. Consider the country-naming suffix <ia> Իա. After a single consonant, this suffix is often pronounced as just [-ja]: [i.da.lja] ‘Italy’ Իտալիա. Resyllabification is possible [i.da.lja], but HD feels this is substantially less com-

<sup>8</sup>Eastern Armenian seems to allow the form [ma.rjam] but this sounds odd to HD’s Western ears.

mon. After two consonants that can be a complex coda, HD reports possible resyllabification: [t<sup>h</sup>urk.ja, t<sup>h</sup>ur.k<sup>h</sup>ja] ‘Turkey’ Թուրքիա. But if the consonant cluster can’t form a complex coda, then the [ija] form feels more preferred than [ja]: [aŋk<sup>h</sup>.li.ja] instead of [aŋk<sup>h</sup>.lja], and not \*aŋk<sup>h</sup>l.ja ‘England’ Անգլիա.

Another case of morpheme-specific variation is the family-name suffix (patronymic suffix) [-jan] -եան. In principle, this suffix can form [Cj] complex onsets: [dov.le.t<sup>h</sup>jan] ~ dov.le.t<sup>h</sup>.jan] ‘Deovletian’ Տեօվլէթեան. However, in HD’s judgment, it is much more typical to break the /Cj/ sequence into separate syllables. Unfortunately, dictionary data is too restricted to determine the exact rates or preferences for this suffix.

Thus, although [Cj] complex onsets are possible, it seems that the language tries to remove such complex onsets if possible. Based on how /V(C)(C)CjV/ clusters are syllabified, it seems that creating [Cj] acts as a last resort.

### 4.6.3 Complex onsets created from schwa elision

write

TODO: for some reason i dont see փփփփփ as deriving փփփփփփփ in my dictionary even though its on nayiri. did i forget to find cases of փփ with glide deletion?

## 4.7 Vowel-vowel sequences or vowel hiatus repair

Vowel hiatus is when the morphology brings together two vowels, creating a hiatus or break from one syllable to another. A sequence of vowels must be pronounced in some way, meaning that the vowel hiatus must be repaired. In Armenian, possible repairs include inserting a glide /j/ (glide epenthesis), inserting a glottal stop /ʔ/, changing one of the vowels to a consonant, deleting one of the vowels, or merging the two vowels into one vowel.<sup>9</sup>

This section goes over how vowel hiatus is repaired in diverse morphological contexts. The choice of rule varies by the type of first vowel and by the morphological identity of the second vowel. The following subsections go through these morphological categories and then phonological subcategories. Furthermore, some vowel-vowel sequences can undergo diverse repair rules without a clear preference, while some sequences can undergo mainly one rule with few exceptions.

- In roots, vowel hiatus is largely diachronic or limited to loanwords (§4.7.1).

<sup>9</sup>Unfortunately, there are no words that end in a vowel /y/ (§3.2.3), and there are virtually no words that end in /ə/ and that can take derivational suffixes.

- Before derivational suffixes, various rules are possible, and the choice varies by vowel and sometimes by the word (§4.7.2).
- In compounds and after prefixoids, some words use various repair rules (similar to derivational suffixation), while some use just glottal stop epenthesis (§4.7.3).
- Before regular inflectional suffixes, glide epenthesis is the main strategy (§4.7.4).
- Before irregular inflectional suffixes, different strategies are possible (§4.7.5).
- Before clitics, glide epenthesis is the main strategy (§4.7.6).

Although vowel hiatus repair rules are naturally limited to only vowel-vowel sequences, there are some consonant-initial suffixes that use rules as a type of paradigmatically-induced overapplication (§4.7.7). There are also some minor problems in diachrony (§4.7.8).

#### 4.7.1 Vowel hiatus in underived words and roots

In this chapter, we almost exclusively focus on how vowel hiatus or vowel-vowel sequences are handled in derived forms, not underived forms. This is because underived forms don't give solid evidence on whether what we see is actually a vowel-vowel sequence, or something else.

To illustrate, consider the word <griay> 'turtle' Գրիայ. Although the orthography shows a vowel sequence <ia>, this word is pronounced as [gərjɑ]. The mismatch between the orthographic <ia> and the pronounced [jɑ] is because of diachrony. In Classical Armenian, such orthographic vowel sequences likely reflected some type of diphthong. Over time, this diphthong turned into a Modern [jɑ] sequence. Synchronically however, even though the [jɑ] is spelled as two vowels <ia>, there is no synchronic evidence that the pronounced [j] is derived from an underlying /i/. Assuming the schwa is epenthetic, the Armenian child has no reason to think that [gərjɑ] is underlyingly /gria/ instead of just /grja/. Similar orthography-phonology mismatches include words like <eōtə> that is pronounced as [jot<sup>h</sup>ə] 'seven' եօթը. See Section §3.1.7 for discussion on the phonemic status of /j/.

A large category of such mismatches involves the digraph <ow> ու that is read as [v] before vowels, but [u] elsewhere. In a root before a vowel, the digraph is read as [v]: <ալօւեօս> [ɑʁves] 'fox' աղուիս. If the [v] is part of an unsyllabiable consonant cluster, then we get an extra schwa: <նօւազ> [nəʋɑz] 'less' նուազ. The reason why such mismatches exist is again because of Classical Armenian where clusters like <owē, owa> were likely read as some diphthong [ʋe,ʋɑ]. But in the modern language, this diphthong was replaced by a [ʋɑ] sequence. Because

such roots don't show any alternations, the child has no reason to treat a word like [ɑvɛs] as derived from an underlying /ɑvɛs/ instead of just /ɑvɛs/.

For such underived words, we only found two corners of the grammar where it is likely that such an orthographic cluster does reflect an underlying vowel-vowel sequence. Both corners involve free variation. One such corner is for the word <hrey> 'Jewish' հրեայ where the cluster is variably pronounced as [həɾɛjɑ] (more archaic) or [həɾjɑ] (more modern). However, such examples likely reflect a change in the underlying representation from /hɾɛjɑ/ (or /hɾea/) to /hɾjɑ/.

The other corner involves non-nativized loanwords. Consider a word like <k'aos> [kʰɑʔos] 'chaos' քաոս or <bant'eon> [bantʰeʔon] 'pantheon' պանթէոն. Such words are obviously loanwords, and their vowel sequence is borrowed in tact, and their hiatus is resolved via a glottal stop. When such words get more frequent or common, their pronunciation is simplified. For example, consider <madt'eos> 'Matthew' Մատթէոս, which prescriptively can be pronounced as [matʰeʔos], but is more commonly pronounced as [matʰjɔs].

Such cases of free variation indicate that vowel sequences must be repaired in some way. But they don't tell us what are productive means of handling vowel-vowel sequences that are created from the morphology, i.e., derived forms. At best, such underived forms tell us what are possible rules for reading orthographic clusters (orthography-phonology mismatches: Section §2.4) and how a word's pronunciation can get simplified over time as it gets nativized or more frequent.

#### 4.7.2 Vowel hiatus repair between roots and derivational suffixes

When studying vowel hiatus in Armenian, the most common contexts in derivational morphology are /V+ɑ/ and /V+u/. For derivational morphology, the majority of derivational suffixes start with /ɑ/. Compounds are also typically formed by combining two stems with the linker /ɑ/. For the other vowels, a common /u/-initial derivational suffix is the nominalizer /-utʰjɛn/ -ութիւն. There are some derivational suffixes for /e/, /o/, and other /u/ suffixes.

It is rather difficult to study how some phonological process works in derivational morphology for various reasons. The first is that different dictionaries have different lists of words. Thus a word that we found in one major dictionary like *Kouyoumdjian* might not exist in another major dictionary. Second, creating new words is a very creative process. So we can't say that some vowel-vowel sequence is always repaired in some specific way, simply because some dictionary out there may list such a sequence with an alternative repair. The third reason

is variability. For a given root, we can find some derivatives that utilize one rule, and other set of derivatives that utilize another rule.

The above factors ultimately mean that any study on vowel hiatus repair that is using a dictionary has limitations. However, because the dictionary we use is rather large, we hope that the following descriptive patterns that we provide can reflect the tendencies in the language.

- /a/ + vowel: repaired via glide epenthesis for most words, but /a/ deletion for some words (§4.7.2.1).
- /e/ + vowel: repaired via glide epenthesis for most words, but /e/ deletion for some words,).
- /i/ + vowel: repaired via glide epenthesis, deletion, or coalescence/merger (/i-a/→[e]), depending on the word (§4.7.2.3).
- /ə/ + vowel: unattested.
- /o/ + vowel: repaired via glide epenthesis (§4.7.2.4).
- /u/ + vowel: repaired via de-vocalization for most words (/u-a/→[va], /u-i/→[vi], etc.), and glide epenthesis for some (§4.7.2.5).

Note that in derivational morphology, glide epenthesis can often be replaced with a glottal stop epenthesis, with unclear sociolinguistic effects or factors.

#### 4.7.2.1 Stem final /a/

When a /a/-final stem precedes the compound linker /a/ or a vowel-initial derivational suffix, there are two attested repair rules: deleting the stem /a/ or glide epenthesis. The choice between the two rules correlates with spelling. If the stem /a/ is spelled as with a final <a> w, then deletion is the default rule. But if the stem /a/ is spelled as <ay> wj, then glide epenthesis is the default rule. However, there are a handful of stems which either display both rules or display the opposite rule.

First let us consider stems with a final <ay>. Glide epenthesis is the default rule before a derivational suffix that starts with an /a/ (/aX/), /u/ (in /-ut<sup>h</sup>jyn/), /u/ in some other suffix (/uX/), /i/ (-iX/), /e/ (-eX/), and /o/ (-oX/). Glide epenthesis is also the rule before the compound linker /-a-/.

In Table 4.69 and onward, we list the number of roots that we found in *Kouy-oumdjian* such that a) this root had this specific phonology-orthographic structure, b) this root was listed as an entry in the dictionary, and c) the dictionary listed derivatives for this root, and d) the derivatives displayed only this vowel hiatus rule in this vowel-vowel sequence. For illustration, we also show the underlying form of the suffix. We show a simplified segmentation for verbal suffixes, meaning /-il/ instead of /-i-l/ (TH-INF).

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Table 4.69: Glide epenthesis in derivation for stems with final [a] <ay>

+/-aX/	<hsgay>	həs'ka	'giant'	հսկայ	n=45
+/-agan/	<hsgayagan>	həskaj-a'gan	'giant-like'	հսկայական	
+/-a-/	<kowrbay>	k <sup>h</sup> ur'ba	'hose'	գուրպայ	n=35
	<kowrbayakordz>	k <sup>h</sup> urbaj-a-'k <sup>h</sup> ordz	'hosier'	գուրպայագործ	
	cf. <kordz>	k <sup>h</sup> ordz	'work'	գործ	
+/-ut <sup>h</sup> jyn/	<xapepay>	χap <sup>h</sup> e'p <sup>h</sup> a	'deceitful'	խաբէբայ	n=59
	<xapepayowt'iwn>	χap <sup>h</sup> ep <sup>h</sup> aj-u't <sup>h</sup> jyn	'deception'	խաբէբայութիւն	
+/-uX/	<k'ahanay>	k <sup>h</sup> aha'na	'priest'	քահանայ	n=7
+/-uhi/	<k'ahanayowhi>	k <sup>h</sup> ahanaj-u'hi	'priestess'	քահանայուհի	
+/-iX/	<fɾtʃakay>	fɾtʃa'k <sup>h</sup> a	'roamer'	շրջագայ	n=7
+/-il/	<k'fɾtʃakayil>	fɾtʃak <sup>h</sup> a'j-il	'to stroll'	շրջագայիլ	
+/-eX/	<p'ilisop'ay>	p <sup>h</sup> ilisop <sup>h</sup> a	'philosopher'	փիլիսոփայ	n=17
+/-el/	<p'ilisop'ayel>	p <sup>h</sup> ilisop <sup>h</sup> a'j-el	'to philosophize'	փիլիսոփայել	
+/-oX/	<xnay>	χəna	'caution'	խնայ	n=11
+/-oɤ/	<xnayoy>	χəna'j-oɤ	'thrifty'	խնայող	

In contrast, for stems that end in <a>, the default behavior is deleting the stem <a> (Table 4.70).

Table 4.70: Stem-vowel deletion in derivation for stems with final [a] <a>

+/-aX/	<asia>	as'ja	'Asia'	Ասիա	n=18
+/-agan/	<asiagan>	asj-a'gan	'Asian'	ասիական	
+/-a-/	<fizik'a>	fizi'k <sup>h</sup> a	'physics'	ֆիզիքա	n=10
	<fizik'akēd>	fizik <sup>h</sup> -a-'k <sup>h</sup> ed	'physicist'	ֆիզիքագէտ	
	cf. <kēd>	'k <sup>h</sup> ed	'learned (archaic)'	գէտ	
+/-ut <sup>h</sup> jyn/	<k'aytea>	k <sup>h</sup> axteja	'Chaldea'	Քաղդէա	n=1
	<k'ayteowt'iwn>	k <sup>h</sup> axtej-u't <sup>h</sup> jyn	'astrology'	քաղդէութիւն	
+/-uX/	<fransa>	fəransa	'France'	Ֆրանսա	n=1
+/-uhi/	<fransowhi>	fərans-u'hi	'French woman'	ֆրանսուհի	
+/-eX/	<kayyia>	k <sup>h</sup> awɣija	'Gaul'	Գաղղիա	n=1
+/-eren/	<kayyerēn>	k <sup>h</sup> awɣij-e'ren	'Gallic language'	գաղղիերէն	

Based on the data so far, it is clear that glide epenthesis is the norm for stems spelled with <ay>, while deletion is the norm for words spelled with <a>. But, there is some degree of variation (Table 4.71). In the *Kouyoumdjian* dictionary, we found some stems that are spelled with <ay> but display deletion before some derivational suffixes.



#### 4.7 Vowel-vowel sequences or vowel hiatus repair

Table 4.71: Glide epenthesis in some stems with final [a] <a>

[a]/+/-eni/	<nowma>	nu'ma	'Mandarin'	նումա
	<nowmayeni>	numaj-en'i	'Mandarin orange'	նումայենի
[a]/+/-a-/	<delta>	del't <sup>h</sup> a	'delta'	տէլդա
	<deltayagerb>	delt <sup>h</sup> aj-a'-gerb	'deltoid'	տէլդայակերպ
	cf. <gerb>	'gerb	'manner'	կերպ

Besides the above exceptions, we found a handful more words that are spelled with <ay> but display vowel deletion in their attested derivatives (Table 4.72). For some of these words like [agra-p<sup>h</sup>erad] 'toothless', it is possible that these words underlyingly never had the linking vowel /-a-/ in the first place /agra + p<sup>h</sup>erad/, thus there is no vowel hiatus to repair. See Section §4.7.3.2 for such compounds.

Table 4.72: Vowel deletion in some stems with final [a] <ay>

[a]/+/-anal/	<momaiy>	mom'ja	'mummy'	մոմիայ
	<momianal>	momj-a'nal	'to get mummified'	մոմիանալ
[a]/+/-a-/	<amiray>	ami'ra	'lord'	ամիրայ
	<amirabed>	amir-a'-bed	'caliph'	ամիրապէտ
	cf. <bed>	'bed	'leader'	պէտ
[a]/+/-a-/	<agray>	agra	'tooth'	ակռայ
	<agrap <sup>h</sup> erad>	agr-a-p <sup>h</sup> e'rad	'gap-toothed'	ակռափեռատ
	cf. <p <sup>h</sup> erad>	p <sup>h</sup> e'rad	'toothless'	փեռատ

What is more revealing is that some words are spelled with <ay>, display glide epenthesis in some derivatives, but vowel deletion in other derivatives (Table 4.73).

Table 4.73: Vowel deletion or glide deletion in some stems with final [a] <ay>

+/-ut <sup>h</sup> jyn/ +/-ig/	<sadanay>	sada'na	'devil'	սատանայ
	<sadanayowt'iwn>	sadanaj-u't <sup>h</sup> jyn	'devilry'	սատանայութիւն
	<sadanayig>	sada'n-ig	'devilet'	սատանիկ
+/-agan/ +/-el/	<arargay>	arar'ga	'object'	առարկայ
	<arargayagan>	araraj-a'gan	'objective'	առարկայական
	<arargel>	arar'g-el	'to object'	առարկել
+/-ap <sup>h</sup> ar/ +/-el/	<mek'enay>	mek <sup>h</sup> ena	'machine'	մեքենայ
	<mek'enayapar>	mek <sup>h</sup> e'naj-ap <sup>h</sup> ar	'mechanically'	մեքենայաբար
	<mek'enapar>	mek <sup>h</sup> en-ap <sup>h</sup> ar	'mechanically'	մեքենաբար

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Based on the above main patterns and exceptions, we conclude that glide epenthesis is the norm for words spelled with <ay>, while vowel deletion is the norm for words spelled with <a>. Exceptions exist for both classes of words.

However, we do not think that the mental grammar of Armenian directly uses these orthographic rules to know when to do glide epenthesis. Such orthographic rules are instead diachronic accidents, discussed more in Section §4.7.8.

Instead, the correlation with orthography is an indirect correlation with morphological structure. The <a>-spelled words tend to end with a country-naming suffix, such as /-a/ in [fərans-a] ‘France’ Ֆրանսա, /-ja/ in [as-ja] ‘Asia’ Ասիա. Other cases are obvious loanwords like [fizika] ‘physics’ ֆիզիկա. In contrast, the <ay> spelling are mostly simple native words. There are of course a few exceptions for this native-loanword generalizations, for example the word [lama] ‘Lama’ is an obvious loanword but it is spelled with <ay> լամա, and it gets glide epenthesis: [lamaj-a-bed] ‘chief Lama’ լամայապէտ.

Further, the <ay> spelling is drastically more common than <a>, simply because <ay> is used for native words. For example, in the *Kouyoumdjian* dictionary, we found at least 100 words with a final <ay> and that have vocalic derivatives, compared with only 24 words with <a>.

Thus we argue that the actual rule for vowel hiatus repair is that native words with final [a] get glide epenthesis, while loanwords or country-names get vowel deletion. Exceptions are limited to the items discussed above.

##### 4.7.2.2 Stem final /e/

It is rather rare to find a word that ends with /e/. When a stem-final /e/ precedes a vowel-initial derivational suffix, the most common repair rule is glide epenthesis (Table 4.74). But there are some cases where either the /e/ or the following vowel is deleted. We first show cases with glide epenthesis.

Table 4.74: Glide epenthesis in derivation for stems with final [e]

+/-aX/	<hiwlē> <hiwlēagan>	hʻle hylej-a'gan	‘atom’ ‘atomic’	հիլէ հիլէական	n=19
+/-a-/	<osdrē> <osdrēavadʒar> cf. <vadʒar>	vost're vostrej-a-va'dʒar va'dʒar	‘oyster’ ‘oyster-seller’ ‘sale’	ոստրէ ոստրէական վաճառ	n=10
+/-uthʻjyn/	<gat'oʻyigē> <gat'oʻyigēowt'iwn>	gatʻoxi'ge gatʻoxigej-u'tʻjyn	‘cathedral’ ‘Catholicism’	կաթողիկէ կաթողիկէութիւն	n=6
+/-uX/ +/-uhi/	<markarē> <markarēowhi>	markʻa're markʻarej-u'hi	‘prophet’ ‘prophetess’	մարգարէ մարգարէուհի	n=1
+/-iX/ +/-ig/	<baxrē> <baxrēig>	bax're bax'rej'ig	‘money’ ‘small money’	պախրէ պախրէիկ	n=1

#### 4.7 Vowel-vowel sequences or vowel hiatus repair

There are of course exceptions (Table 4.75). We found words which can a) delete the stem /e/, b) merge the the stem and suffix /e/ into one vowel, c) delete the vowel of the suffix or linker, or d) use glide epenthesis. Most of these exceptional roots would use one strategy in one derivative, but another strategy in another

Table 4.75: Glide epenthesis vowel deletion in derivation for some stems with final [e]

+/-agan/	<ap'roditē> <ap'roditagān>	ap <sup>h</sup> rodi't <sup>h</sup> e ap <sup>h</sup> rodi't <sup>h</sup> -a'gan	'Aphrodite' 'venereal'	Ափրոդիտէ ափրոդիտական
+/-eni/	<xahowē> <xahowēni>	χah've χahv-e'ni	'coffee' 'coffee-tree'	խահուէ խահուենի
+/-arar/	<xahowearar>	χahvej-a'rar	'coffeehouse keeper'	խահուէարար
+/-anoŋs/	<pazē> <pazēnoŋs'>	p <sup>h</sup> a'ze p <sup>h</sup> aze-'noŋs	'falcon' 'hawking-pouch'	բազէ բազէնոց
+/-a-girt <sup>h</sup> /	<pazēagirt'>	p <sup>h</sup> azej-a-girt <sup>h</sup>	'falconer'	բազէակիրթ

As a last note, for words like [hylej-agan] 'atomic' հիլէական or [ej-ut<sup>h</sup>jvn] 'existence' էութիւն (from [e] 'is' է), we transcribe the glide as a fully pronounced glide [j]. However, in HD's judgment, in careful speech this glide can be considerably weakened to either a transient glide [hyle<sup>j</sup>-agan] or even a glottal stop [hyleʔ-agan]. He also reports that the preference of a glottal stop feels more salient if the root sounds more clearly like a loanword: [serofpe] 'seraph' սերովբէ and [serofpeʔ-agan] 'seraphic' սերովբէական.

In HD's judgements, the full glide form is quite common in Western Armenian. In contrast, VP informs us that Eastern Armenian uses a transient glide or glottal stop more often. In Armenian philology, the transcription of <ē.a> է.ա can be variably pronounced as [eja], [e<sup>h</sup>a], or [eʔa]. This makes it difficult to get reliable statistical data on this free variation.

##### 4.7.2.3 Stem final /i/

When a stem-final /i/ precedes a vowel-initial derivational suffix, we find various possible repair strategies: glide epenthesis, deleting the /i/, or merging the /i/ and the next vowel /a/ into [e] (coalescence). The choice of strategy sometimes correlates with the morphological identity of the /i/, but also seems random.

First, there is productive derivational suffix -i that can be added after virtually any verb (ending in /el/ or /al/) to create an adjective (Table 4.76). This suffix can then undergo further derivational suffixation with either the nominalizer /-

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ut<sup>h</sup>jyn/ or the adverbializer /-oren/. Vowel hiatus between this suffix /i/ and the next vowel is repaired by glide epenthesis.

Table 4.76: Glide epenthesis in derivation for stems with deverbal suffix [-i]

+/-ut <sup>h</sup> jyn/	<badʒel>	badʒel	‘to punish’	պատժել	n=51
	<badʒeli>	badʒeˈl-i	‘punishable’	պատժելի	
	<badʒeliowtˈiwn>	badʒel-ij-ut <sup>h</sup> jyn	‘penalization’	պատժելիություն	
+/-oren/	<xʏdʒal>	χəḳdʒal	‘to pity’	խղճալ	n=6
	<xʏdʒali>	χəḳdʒaˈl-i	‘pitiful’	խղճալ	
	<xʏdʒaliōren>	χəḳdʒaˈl-ij-oren	‘pitifully’	խղճալիորէն	

Thus, glide epenthesis is the norm for this suffix /i/ and its derivatives. However, in HD’s judgment, careful speech allows replacing this inserted glide [j] in [badʒel-ij-ut<sup>h</sup>jyn] with either a transient glide [ʲ] or a glottal stop: [badʒel-iʲ-ut<sup>h</sup>jyn, badʒel-iʔ-ut<sup>h</sup>jyn]. Based on judging the Eastern Armenian entries on English Wiktionary, the weak glide or glottal stop form seems to be more common in casual speech in Eastern Armenian.

Note that there are many words with a final /i/ that is a) ambiguously a derivational suffix and b) is absent in some related forms. We set aside these words from discussion. For example, [arp<sup>h</sup>i] and [arp<sup>h</sup>] both mean ‘sun’ արփ, արփի. Thus in a form like [arp<sup>h</sup>-avor] ‘luminous’ արփաւոր, we have no way of knowing if this word was derived from [arp<sup>h</sup>] or from [arp<sup>h</sup>i] with deletion.

Glide epenthesis is also attested in some roots (Table 4.77). There are five monosyllabic words that end in [i]. When a vowel suffix is added, we see glide epenthesis.

#### 4.7 Vowel-vowel sequences or vowel hiatus repair

Table 4.77: Glide epenthesis in derivation for monosyllabic stems with final [i]

+/-aX/	<tsi>	tsi	‘horse’	ծի
+/-avor/	<tsiawor>	tsij-a'vor	‘horseman’	ծիաւոր
+/-aX/	<ti>	t <sup>h</sup> i	‘corpse’	դի
+/-ag/	<tiag>	t <sup>h</sup> i'j-ag	‘corpse’	դիակ
+/-a-/	<t'i>	t <sup>h</sup> i	‘shovel’	թի
+/-a-/	<t'iat <sup>h</sup> sowg>	t <sup>h</sup> ij-a'-tsug	‘paddle fish’	թիւածուկ
	cf. <tsowg>	tsug	‘fish’	ծուկ
+/-ut <sup>h</sup> jyn/	<mi>	mi	‘one’	մի
	<miowt'iwn>	mij-u't <sup>h</sup> jyn	‘unity’	միութիւն
+/-oX/	<li>	li	‘full’	լի
+/-ov/	<liov>	li'j-ov	‘fully’	լիով

As before, some of these tokens could be pronounced with a glottal stop in more formal speech, such as [mij-ut<sup>h</sup>jyn] or [miʔ-ut<sup>h</sup>jyn] ‘unity’.

There is likewise a monosyllabic root [di] տի which seems to be a bound root, because it is almost always found as part of a compound with the word [jezerk<sup>h</sup>] ‘edge’, as [dij-ezerk<sup>h</sup>] ‘cosmos’ տիեզերք.

Although glide epenthesis is the norm for the above words, there are morphemes that prefer vowel deletion (Table 4.78). The suffix /-eni/ that used to derive plant names and other words. This suffix tends to delete before other vowel-initial derivational suffixes.

Table 4.78: Vowel deletion in derivation for stems with suffix [-eni]

+/-aX/	<t't'eni>	t <sup>h</sup> ət <sup>h</sup> eni	‘mulberry tree’	թթենի	n=7
+/-agan/	<t't'enagan>	t <sup>h</sup> ət <sup>h</sup> en-a'gan	‘moric’	թթենական	
+/-a-/	<aydzeni>	ajdze'ni	‘goat’s hair’	այծենի	n=4
	<aydzenakordz>	ajdzen-a-'k <sup>h</sup> ordz	‘chamois dresser’	այծենագործ	
	cf. <kordz>	k <sup>h</sup> ordz	‘work’	գործ	
+/-ut <sup>h</sup> jyn/	<vayreni>	vajre'ni	‘savage’	վայրենի	n=1
	<vayrenowt'iwn>	vajren-u't <sup>h</sup> jyn	‘savageness’	վայրենութիւն	
+/-oX/	<epeni>	jep <sup>h</sup> e'ni	‘ebony tree’	եբենի	n=2
+/-os/	<epenos>	jep <sup>h</sup> e'n-os	‘ebony’	եբենոս	

Although deletion is the norm for this suffix, we have found some instances where the vowel of [-eni] is optionally deleted: [k<sup>h</sup>axkeni] ‘townsman’ քաղքենի can derive the word ‘middle class’ with either deletion [k<sup>h</sup>axken-ut<sup>h</sup>jyn] քաղքենութիւն or glide epenthesis [kaxkenij-ut<sup>h</sup>jyn] քաղքենիութիւն.

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Besides the above easily organized categories, most cases of final /i/ seem to behave randomly (Table 4.79). For example, some words with final /i/ always used a glide in their derivatives in *Kouyoumdjian*.

Table 4.79: Other stems with final /i/ that always use glide epenthesis in *Kouyoumdjian*

+/-aX/ +/-agan/	<naxayi> <naxayiagan>	naχa'xi naχa'xi-j-a'gan	'duodenum' 'duodenal'	նախաղի նախաղիական	n=11
+/-a-/	<ari> <ariasird> cf. <sird>	a'ri a'ri-j-a'-sird 'sird	'brave' 'courageous' 'heart'	արի արիասիրտ սիրտ	n=7
+/-ut <sup>h</sup> jyn/	<amowri> <amowriowt'iwn>	amu'ri amuri-j-u't <sup>h</sup> jyn	'bachelor' 'single life'	ամուրի ամուրիութիւն	n=17
+/-uX/ +/-uhi/	<k'ayak'ats'i> <k'ayak'ats'iowhi>	k <sup>h</sup> aχak <sup>h</sup> a'tsi k <sup>h</sup> aχak <sup>h</sup> a'tsij-u'hi	'citizen' 'citizeness'	քաղաքացի քաղաքացիուհի	n=1
+/-eX/ +/-el/	<sdnti> <sdntiel>	əstən't <sup>h</sup> i əstənt <sup>h</sup> i'j-el	'fosterling' 'to suckle'	ստնդի ստնդիել	n=1
+/-oX/ +/-on/	<k'ani> <k'aniōn>	k <sup>h</sup> a'ni k <sup>h</sup> ani'j-on	'how many' 'how many'	քանի քանիօն	n=2

For the above set of words, it's possible that some of these include a derivational suffix *i*, and it is this suffix which prefers glide epenthesis. For example, the word [ɑjɾi] 'widow' արի could be historically derived from the word [ɑjɾ] 'man' ար. This word takes glide epenthesis in its derivatives: [ɑjɾij-anal] 'to become a widow' արիանալ.

In another set of words, the vowel /i/ is deleted in all the derivatives that are reported in *Kouyoumdjian* (Table 4.80).

#### 4.7 Vowel-vowel sequences or vowel hiatus repair

Table 4.80: Other stems with final /i/ that always deletes in **Kouyoumd-jian**

+/-aX/	<tapni> <tapnayin>	tʰapʰni tʰapʰn-aʹjin	‘laurel’ ‘of laurel’	դաբնի դաբնային	n=29
+/-a-/	<kaydni> <kaydnabah> cf. <bah>	kʰaχtʰni kʰaχtn-aʹbah ʹbah	‘secret’ ‘discreet’ ‘keeper’	գաղտնի գաղտնապահ պահ	n=25
+/-utʰjyn/	<amehi> <amehowtʰiwn>	ameʰii ameh-uʰtʰjyn	‘wild’ ‘wildness’	ամեհի ամեհութիւն	n=28
+/-uX/	<barmani>	barmaʹni	‘young man’	պարմանի	n=5
+/-uhi/	<barmanowhi>	barman-uʹhi	‘young woman’	պարմանուհի	
+/-iX/	<kadayi>	gadaʹi	‘mad’	կատաղի	n=1
+/-il/	<kadayil>	gadaʹi-il	‘to go mad’	կատաղիլ	
+/-eX/	<vratsʹi>	vəraʹtsi	‘Georgian’	վրացի	n=10
+/-eren/	<vratsʹerēn>	vəraʹts-eʹren	‘Georgian language’	վրացերէն	
+/-oX/	<asyani>	asχaʹni	‘thread’	ասղանի	n=4
+/-ots/	<asyanotsʹ>	asχaʹn-ots	‘needle-case’	ասղանկ	

Another set of words shows a special rule of fusing or merging /i/ with /a/ to form [e] (Table 4.81). We found 8 words which only had derivatives before /a/, and here the /i/ and /a/ merged to [e].

Table 4.81: Other stems with final /i/ where the /i/ coalesces with /a/ to form [i]

+/-avor/	<aki> <akewor> cf. <kordzawor>	aʹkʰi akʰ-eʹvor kʰord z-aʹvor	‘tail’ ‘tailed’ ‘worker’	ազի ազետոր գործաւոր
+/-a-/	<dari> <darekirkʹ> cf. <kirkʹ>	daʹri daʹr-eʹkʰirkʰ ʹkʰirkʰ	‘year’ ‘annal’ ‘book’	տարի տարեգիրք գիրք

Much more common are roots which seem to randomly pick one out of the three possible repair rules (Table 4.82: glide epenthesis, deletion, /e/ coalescence). Although the coalescence rule is restricted to before /a/, these roots can also randomly use either glide epenthesis or vowel deletion in this same phonological context or in other phonological contexts. We found 35 such roots, many of which are quite high-frequency.

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Table 4.82: Other stems with final /i/ that randomly show coalescence, glide epenthesis, or deletion

/i-anots/→[e]	<koti> <kotenots'> cf. <aypanots'>	k <sup>h</sup> o't <sup>h</sup> i k <sup>h</sup> ot <sup>h</sup> e-'nots ɑxp-ɑ'nots	'leper' 'Lazar-house' 'sewer'	գողի գողենց աղբանց
/i-ut <sup>h</sup> jyn/→[u]	<kotowt'iwn>	k <sup>h</sup> ot <sup>h</sup> -u't <sup>h</sup> jyn	'leprosy'	գողութիւն
/i-a-/→[e]	<abagi> <abage-kordz> cf. <kordz>	aba'gi abag-e'k <sup>h</sup> ordz k <sup>h</sup> ordz	'glass' 'glass-maker' 'work'	ապակի ապակեգործ գործ
/i-a-/→[ɑ]	<abagavadzar> cf. <vadzar>	abag-ɑ-vɑ'dzar vɑ'dzar	'glass-seller' 'sale'	ապակավաճառ վաճառ
/i-avor/→[e]	<hoki> <hokewor> cf. <t'akawor>	ho'k <sup>h</sup> i hok <sup>h</sup> -eva'dzar t <sup>h</sup> ak <sup>h</sup> -ɑ'vor	'soul' 'spiritual' 'king'	հոգի հոգետոր թագաւոր
/i-anal/→[ija]	<hokianal>	hok <sup>h</sup> ij-ɑ'nal	'to revive'	հոգիանալ

In sum, a stem-final /i/ can display a quite random assortment of possible changes before a vowel-initial derivational suffix. Although some morphological categories show consistent behavior, many words seem to just randomly pick one of three possible repairs. The rule is used in some derivatives, but not others, and there is no clear semantic, morphological, or phonological rationale behind this variation.

##### 4.7.2.4 Stem final /o/

Words with a final /o/ are rare. Thus, it is even rarer to find a /o/-final stem that takes a derivational suffix (Table 4.83). The only cases we found in Kouyoumdjian were stems where the /o/ was spelled as <oy>. The vowel sequence undergoes glide epenthesis.

Table 4.83: Glide epenthesis in derivation for stems with final [o]

+/-aX/	<martahad <sup>h</sup> oy>	mart <sup>h</sup> aho'dzo	'flatterer'	մարդահաճոյ	n=1
+/-anal/	<martahad <sup>h</sup> oyanal	mart <sup>h</sup> ahad <sup>h</sup> oj-ɑ'a>	'to flatter'	մարդահաճոյանալ	
+/-a-/	<t <sup>h</sup> xoy> <t <sup>h</sup> xoyahaw> cf. <haw>	t <sup>h</sup> əf <sup>h</sup> xo t <sup>h</sup> əf <sup>h</sup> xoj-ɑ'hav 'hav	'queen' 'fat pullet' 'chicken'	ղշխոյ ղշխոյահաւ հաւ	n=1
+/-ut <sup>h</sup> jyn/	<vadaparoy> <vadaparoyowt'iwn>	vadap <sup>h</sup> ɑ'ro vadap <sup>h</sup> aroj-u't <sup>h</sup> jyn	'coward' 'cowardice'	վատաբարոյ վատաբարոյութիւն	n=12
+/-eX/	<gogoy>	go'go	'cocoa'	կոկոյ	n=1
+/-eni/	<gogoyeni>	gogoj-e'ni	'coco tree'	կոկոյենի	



## 4.7.2.5 Stem final /u/

For words with final /u/, the most common vowel hiatus repair rule is turn the /u/ into [v] (Table 4.84). We call this process /u/-devocalization. There are many common words which show this process before virtually all types of vowels.

Table 4.84: /u/-devocalization in derivation for stems with final [o]

+/-aX/	<owrow>	u'ru	'ghost'	ուրու	n=11
+/-agan/	<owrowagan>	urv-a'gan	'ghost'	ուրուական	
+/-a-/	<tsow>	tsu	'egg'	ծու	n=14
	<tsowagat'>	tsəv-a'-gat <sup>h</sup>	'egg-nog'	ծուակաթ	
+/-ut <sup>h</sup> jyn/	<erglezow>	jergle'zu	'bilingual'	երկլեզու	n=2
	<erglezowot'iwn>	jerglezv-u't <sup>h</sup> jyn	'duplicity'	երկլեզուութիւն	
+/-iX/	<lezow>	le'zu	'tongue'	լեզու	n=4
+/-ig/	<lezowig>	lez'v-ig	'little tongue'	լեզուիկ	
+/-eX/	<t <sup>h</sup> ow>	t <sup>h</sup> u	'travel'	չու	n=7
+/-el/	<t <sup>h</sup> owel>	t <sup>h</sup> ə'v-el	'to migrate'	չուել	
+/-oX/	<t't'ow>	t <sup>h</sup> ə't <sup>h</sup> u	'sour'	թթու	n=1
+/-od/	<t't'owod>	t <sup>h</sup> ə't <sup>h</sup> v-od	'sourish'	թթուտ	

Note that [v] can trigger schwa epenthesis to syllabify the consonant cluster. The [v] is variably devoiced to [f] after voiceless sounds; this is discussed in Section §3.3.7.2.

In the traditional orthography, both the /u/ and the devocalized [v] are spelled the same as <ow> ու. But in the reformed orthography as used for Eastern Armenian, the devocalized [v] is spelled as [v] վ.

The rule of /u/-devocalization is the default rule for handling /u/ before a vowel-initial derivational suffix. There are limited exceptions (Table 4.85). The word for 'two' [jergu] and its derivatives like 'twelve' [dasnəjergu] generally resist /u/-devocalization in their derivatives. Instead we get glide epenthesis. Although some of these derivatives can be pronounced with a [v] like [jergv-agan], the glide-based derivatives like [jerguj-agan] are significantly more commonly heard. The word 'pilot' [ot<sup>h</sup>at<sup>h</sup>u] 'pilot' behaves the same.

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Table 4.85: Words that take glide epenthesis for stems with final [o]

	<ergow>	jer'gu	'two'	երկու
	<ergowagan>	jerguj-ɑ'gan	'dual'	երկուական
	<ergowowt'iwn>	jerguj-u <sup>h</sup> jyn	'bilocation'	երկուութիւն
but	<ergoworeag>	jergv-or'jag	'twin'	երկուորեակ
	<ōtatf <sup>h</sup> ow>	ot <sup>h</sup> ɑtʃu	'pilot'	օդաչու
	<ōtatf <sup>h</sup> owagan>	ot <sup>h</sup> ɑtʃuj-ɑ'gan	'aeronautic'	օդաչուական
or		ot <sup>h</sup> ɑtʃv-ɑ'gan		

Besides the above words, there are some morphological categories of words with final /u/. Some of these groups tend to show devocalization, while others arguably use deletion.

There are many words that end in the morpheme [-du], such as [hamar-ɑ-du] 'accountable' համարատու. Here, we know this [-du] is some sort of compound-like suffix (a suffixoid) because there's a word [hamar] 'account'. This suffix/-compound [-du] is used with the general meaning of 'I give X or have X', and is related to the verb 'to give' [dal] տալ. In general, these morpheme undergoes /u/-devocalization before the suffix /-ut<sup>h</sup>jyn/: [hamar-ɑ-dəv-ut<sup>h</sup>jyn] 'report' համարատուութիւն.

Though we have found some cases of variation. For the word [tsajn-ɑ-du] 'sonorous' ծայնատու, we found a form with devocalization in [tsajn-ɑ-dəv-ut<sup>h</sup>jyn] 'resonance' ծայնատուութիւն, but also a form with deletion in [tsajn-ɑ-d-ut<sup>h</sup>jyn] 'aphonia' ծայնատուութիւն.

On a last note, there are many words that end in a suffix /-u/, especially as part of some suffix sequence /-ar-u/ where the /-ar/ is related to the verb [arnel] 'to take': [p<sup>h</sup>orts] 'attempt' փորձ derives [p<sup>h</sup>orts-ɑr-u] 'experienced' փորձառու. But for such suffixes, it is hard to determine how they behave with vowel hiatus. When we come across a derivative like [p<sup>h</sup>orts-ɑr-ɑgan] 'experimental' փորձառական, it is difficult to know if the suffix /-u/ was deleted, or if it was just never added in the first place.

In sum, when a vowel-initial derivational suffix is added after an /u/, the default rule is devocalizing the /u/ to [v], but with some variation.

#### 4.7.3 Vowel hiatus repair in compounds and prefixoids

**write** Compound formation is a derivational process. Most 'typical' compounds are formed by combining two stems with a vowel /-ɑ-/. This vowel triggers the same vowel hiatus rules as /ɑ/-initial derivational suffixes (§4.7.3.1). This vowel

is generally deleted before vowel-initial roots. But in some ‘atypical’ compounds and with prefixoids (§4.7.3.2), the /-a-/ is present before a root and triggers glottal stop epenthesis.

#### 4.7.3.1 Vowel hiatus repair in typical compounds

The most typical way to form a compound is to combine two stems with a linking vowel /-a-/. If the first stem is V-final, then the vowel sequence between that stem and /-a-/ is typically modified in some way, such as glide epenthesis. The various strategies for /V-a-/ sequences is discussed in Section §4.7.2. But if the second stem starts with a vowel, then the linking vowel /-a-/ is typically omitted (Table 4.86).

Table 4.86: Vowel hiatus repair in typical compound constructions

XC + CX →XC-a-CX	an'gyn + 'k <sup>h</sup> idz an'gyn-a-'k <sup>h</sup> idz	‘angle + line’ ‘diagonal’	անկիւն, գիծ անկիւնագիծ
Xa + CX →Xaj-a-CX	və'ga + 't <sup>h</sup> ux̣t vəgaj-a-'t <sup>h</sup> ux̣t	‘witness + paper’ ‘certificate’	վկայ, թուղթ վկայաթուղթ
XC + VC →XC-VX	'merts + i'mast merts-i'mast	‘close + meaning’ ‘rough meaning’	մերծ, իմաստ ' մերծիմաստ
XC + jeX → XC-eX	'voxp + 'jerk <sup>h</sup> voxp-erk <sup>h</sup>	‘lamentation + song’ ‘tragic ballad’	ողբ, երգ ողբերգ
XC + voX → XC-oX	'k <sup>h</sup> ajl + 'vors k <sup>h</sup> ajl-ors	‘wolf + hunt’ ‘wolf-hunter’	գայլ, որս գայլորս

If the second stem’s first two segments are [je] ɛ or [vo] n, then the prescriptive rule is that that the second stem is treated as if it’s vowel-initial. The [j] and [v] are absent. Adding the [j] or [v] however is attested in some special contexts (§4.7.3.2).

Very rarely, a compound is formed where a) the second stem starts with a consonant, but b) there is no linking vowel (Table 4.87). The first stem can either end in a consonant or vowel. It seems that the final vowel of the first stem does not undergo alternations. We use the qualifier ‘seems’ because the relevant data is quite few, thus making it hard to form concrete generalizations.

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Table 4.87: Lack of vowel hiatus repair when there is no subsequent vowel in compounds

Xa + CX →Xa-CX	ʃap <sup>h</sup> Yʁa + tsev ʃap <sup>h</sup> Yʁ-a tsev	‘sapphire + shape’ ‘sapphire-shaped’	շափիւղայ, ծեւ շափիւղածեւ
Xe + CX →Xe-CX	p <sup>h</sup> a'ze + dʒandʒ p <sup>h</sup> aze- dʒandʒ	‘hawk + fly’ ‘hawk fly’	բազէ, ճանճ բազէճանճ
Xi + CX →Xi-CX	k <sup>h</sup> e'xi + 'dun k <sup>h</sup> e'xi- 'dun	‘rudder + house’ ‘wheelhouse’	քեղի, տուն քեղիտուն

But if the first stem ends in a vowel, while the second stem starts with a vowel, then the linking vowel is absent (Table 4.88). Vowel hiatus is usually repaired as if the second stem was a suffix. For example, /u/ generally becomes [v] before both suffix-vowels and root-vowels. /i/ tends to either delete or cause glide epenthesis, depending on the root. /a/ can trigger a glide or delete. And /e/ tends to take glide epenthesis as well.

Table 4.88: Vowel hiatus repair in compounds where first stem ends with vowel, and second one starts with vowel

Xa + aX →Xaj-aX	ar <sup>h</sup> k <sup>h</sup> a + aŋ <sup>h</sup> k <sup>h</sup> əʁ ar <sup>h</sup> k <sup>h</sup> aj-aŋ <sup>h</sup> k <sup>h</sup> əʁ	‘king + vulture’ ‘king vulture’	արքայ, անգղ արքայանգղ
Xa + əX →X-əX	p <sup>h</sup> e'sa + əŋ'ger p <sup>h</sup> es-əŋ'ger	‘groom + friend’ ‘groomsman’	փեսայ, ընկեր փեսընկեր
Xu + əX →Xv-əX	tsu + əŋga'l-itʃ tsəv-əŋ'gal	‘egg + receiver’ ‘ovary’	ծու, ընկալիչ ծուընկալ
Xi + oX →X-oX	jegexet <sup>h</sup> si + 'orh'nek <sup>h</sup> jegexet <sup>h</sup> so'rh'nek <sup>h</sup>	‘church + blessing’ ‘consecration’	եկեղեցի, օրհնէք եկեղեցօրհնէք
Xi + aX →Xij-aX	tsi + 'ar <sup>h</sup> tsag tsij-ar <sup>h</sup> tsag	‘horse + untied’ ‘consecration’	ծի, արծակ ծիարծակ
Xi + oX →Xij-oX	k <sup>h</sup> i + o'xi k <sup>h</sup> ij-o'xi	‘juniper + gin’ ‘gin’	գի, օղի գիօղի
Xe + aX →Xe-j-aX	χah've + a'man χahvej- 'a'man	‘coffee + pot’ ‘coffee-pot’	խահուէ, աման խահուէաման

For some these cases, HD feels its possible to just use a glottal stop instead of glide epenthesis: [χahve?-aman] ‘coffee-pot’. He likewise reports that using a glottal stop before a root ‘feels’ more common than using a glottal stop before a suffix.

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And as for the second stem, if the stem starts with [je,vo], then it is again treated as starting with [e,o] (Table 4.89). Vowel hiatus repair rules apply, as if the the second stem was a suffix. For example, /i/ and /a/ can delete or trigger glide epenthesis. Unfortunately, it is hard to know if this glide was epenthetic because of hiatus, vs. just retained from the second stem.

Table 4.89: Vowel hiatus repair in compounds where first stem ends with vowel, and second one starts with [vo,je]

Xi + voX →X-oX	k <sup>h</sup> e'ri + vor't <sup>h</sup> i k <sup>h</sup> er-or't <sup>h</sup> i	'uncle + son' 'king vulture'	քեռի, որդի քեռորդի
Xa + voX →Xaj-oX	ar'k <sup>h</sup> a + vor't <sup>h</sup> i ark <sup>h</sup> aj-or't <sup>h</sup> i	'king + son' 'prince'	արքայ, որդի արքայորդի
Xi + jeX →Xij-eX	'mi + je'raŋk <sup>h</sup> mij-e'raŋk <sup>h</sup>	'one + color' 'monochromous'	մի, երանգ միերանգ
Xi + jeX →X-eX	vos'ki + jex'tʃyr vosk-eχ'tʃyr	'gold + horn' 'golden horn'	ոսկի, եղջիւր ոսկեղջիւր
Xa + jeX →Xaj-eX	ar'k <sup>h</sup> a + je'rag ark <sup>h</sup> aj-e'rag	'king + vein' 'basilisk'	արքայ, երակ արքայերակ

Thus, when a compound has both a V-final first stem and a V-initial second stem, then it seems that the default pattern is to resolve the vowel hiatus by using the same rules as if the second stems is a derivational suffix.

However, we have found some bizarre cases of vowel hiatus repair in compounds that are hard to explain (Table 4.90). There are some compounds where the first stem ends in /i/, and this vowel becomes [e] before a vowel-initial stem. It seems that for such words, the linking vowel /-a-/ was temporarily added creating an underlying three vowel-cluster /i-a-V/. The /i-a/ then merged or coalesced into /e/, and then the /e-V/ triggers a glottal stop. Surprisingly, a glide sounds quite bizarre here in HD's judgments.

Table 4.90: Vowel hiatus repair in compounds where first stem ends with a derived [e], and second one starts with a vowel

Xi + VX	k <sup>h</sup> a'ri + a'lyr k <sup>h</sup> areʔ-a'lyr	'barley + flour' 'barley flour'	գարի, ալիւր գարէալիւր
→Xeʔ-VX	vos'ki + 'oʁ voske'ʔ-oʁ	'gold + ring' 'gold ring'	ոսկի, օղ ոսկէօղ
→Xeʔ-VX	vos'ki + 'aɣən voske'ʔ-aɣən	'gold + gem' 'gold ring'	ոսկի, ակն ոսկեակն

## 4.7.3.2 Vowel hiatus repair in prefixoids and atypical compounds

The previous section discussed ‘typical’ compounds. However, there are rare cases where a compound’s second stem starts with a vowel, but a vowel linker /-ɑ-/ is inserted. Here, the linking vowel is phonologically unneeded but it is arbitrarily used because of the morphology. The hiatus between the linker and the second stem is repaired by a glottal stop. We discuss three such cases: numerals, prefixoids, and normal compounds.

One case comes from complex numerals where the linker is [ə]. Dialects and registers differ in whether this linker is pronounced before V-initial roots (Table 4.91). This is discussed in **numeral morphology**. HD’s Western dialect prefers using this schwa even before a vowel, thus triggering a glottal stop.

Table 4.91: Numerals with a glottal stop after the linker

	'das + 'ut <sup>h</sup> ə	'ten + eight'	տաս, ութը
→	dasn-əʔ-ut <sup>h</sup> ə	'eighteen'	տասնըութը
	'das + 'inə	'ten + nine'	տաս, ինը
	dasn-əʔ-inə	'nineteen'	տասնըինը

Another common case are compounds that use prefixoids like [ham-ɑ-] ‘pan-’, [hag-ɑ-] ‘anti-’ or [amen-ɑ-] ‘most’ (Table 4.92). As explained in **prefixoid chapter**, the prefixoid is made up of a root-like prefix and a linking vowel /-ɑ-/. For some prefixoids, the linking vowel is usually absent before vowels. But there are arbitrary cases where the linking vowel is present, triggering a glottal stop. Some prefixoids like [amen-ɑ-] exceptionally always take the linking vowel.

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Table 4.92: Prefixoids with a glottal stop after the linker

	[ham-a] ‘pan-’, [hag-a] ‘anti-’		[amen-a] ‘most’	
/a/	arap <sup>h</sup> a’gan ‘Arabian’ արաբական	ham-aʔ-arap <sup>h</sup> agan-u <sup>h</sup> jyn ‘Pan-Arabism’ համաարաբականություն	anu’nov ‘renowned’ անունով	amen-aʔ-anu’nov ‘most renowned’ ամենաանունով
/e/	ēju <sup>h</sup> t’jyn ‘existence’ էություն	ham-aʔ-ēju <sup>h</sup> t’jyn ‘consubstantiality’ համաէություն	eja’gan ‘essential’ էական	amen-aʔ-eja’gan ‘most essential’ ամենաէական
/i/	is’lam ‘Islam’ իսլամ	ham-aʔ-isla’m-izm ‘Pan-Islamism’ համաիսլամիզմ	imas’tun ‘wise’ իմաստուն	amen-aʔ-imas’tun ‘wisest’ ամենաիմաստուն
/ə/	əŋgera’jin ‘social’ ընկերային	hag-aʔ-əŋgera’jin ‘anti-social’ հակաընկերային	ənt <sup>h</sup> u’nag ‘capable’ ընդունակ	amen-aʔ-ənt <sup>h</sup> u’nag ‘most capable’ ամենաընդունակ
/o/	orina’gan ‘legitimate’ օրինական	ham-aʔ-orina’gan ‘illegitimate’ հակաօրինական	ort <sup>h</sup> njal ‘blessed’ օրինեալ	amen-aʔ-ort <sup>h</sup> njal ‘Most Blessed’ ամենաօրինեալ
/u/	udo’bja ‘utopia’ ուտոպիա	hag-aʔ-ədo’bja ‘anti-utopia’ հակաուտոպիա	u’zeɣ ‘strong’ ուժեղ	amen-aʔ-u’zeɣ ‘strongest’ ամենաուժեղ

Similarly, in a typical compound, the linking vowel is absent before a vowel. But in some arbitrary cases (Table 4.93), especially neologisms or technically vocabulary, the linking vowel is present. The vowel hiatus caused by the linking vowel and root triggers a glottal stop. Note that we know that these compounds are single words because a) they written as one word, b) they have final stress, and c) the first stem undergoes morphophonological alternations like vowel reduction (last two columns in Table 4.93).

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Table 4.93: Compounds with a glottal stop after the linker

	Without reduction		With reduction	
/a/	əsta'moks + a'ɪk <sup>h</sup> 'stomach + intestine' ստամոքս, աղիք	əstamoks- <b>aʔ</b> -a'ɪk <sup>h</sup> -a'jin 'gastrointestinal' ստամոքսաաղիքային	jera'zɪft + a'lik <sup>h</sup> 'musician + wave' երաժիշտ, ալիք	jeraʒəft- <b>aʔ</b> -alik <sup>h</sup> 'music channel' երաժշտաալիք
/e/	k'həris'tos + eɪf- 'Christ + √descend' Քրիստոս, էջ	k'həristos- <b>aʔ</b> -eɪf- 'Christ descent' Քրիստոսաէջ	'lujs + 'eɪf 'light + page' լոյս, էջ	lus- <b>aʔ</b> -eɪf 'illuminated page' լուսաէջ
/i/	i'mast + 'iχts 'meaning + wish' իմաստ, իղծ	imast- <b>aʔ</b> -iχts 'sensible' իմաստաիղծ	hən'tɪg + i'ran 'Indian + Iran' հնդիկ, Իրան	həntk- <b>aʔ</b> -iran-jaŋ 'Indo-Iranic' հնդկաիրանեան
/ə/	aɪχar + əmp'hər'num 'world + perception' աշխարհ, ըմբռնում	aɪχar- <b>aʔ</b> -əmp'hər'num 'worldview' աշխարհաըմբռնում	hən'tɪg + əŋ'gujz 'Indian + walnut' հնդիկ, ընկոյզ	həntk- <b>aʔ</b> -əŋ'gujz 'coconut' հնդկընկոյզ
/o/	'zart <sup>h</sup> + 'oɪ 'decoration + ear-ring' զարդ, օղ	zart <sup>h</sup> - <b>aʔ</b> -oɪ 'decorative ear-ring' զարդաօղ	jer'gin + 'ot <sup>h</sup> 'heaven (archaic) + air' երկին, օդ	jergn- <b>aʔ</b> -ot <sup>h</sup> a'jin 'airborne' երկնաօդային
/u/	'ot <sup>h</sup> + u'ɪ 'air + way' օդ, ուղի	ot <sup>h</sup> - <b>aʔ</b> -u'ɪ 'airway' օդաուղի	'mɪft + u'rɑχ 'always + happy' միշտ, ուրախ	məft- <b>aʔ</b> -u'rɑχ 'ever-happy' մշտաուրախ

When the prefixoid or compound uses the linker /a/ and when the second stem starts [vo,je], then the [vo,je] surfaces in the compound (Table 4.94).

Table 4.94: Compounds with a linker before [je,vo]

	/-a/ + [je]		/-a/ + [vo]	
Prefixoid	jer'gir 'Earth' երկիր	hag- <b>a</b> -jerg'r-ja 'antichthon' հակաերկրեայ	volord'a'gan 'horizontal' հորիզոնական	hag- <b>a</b> -volord'a'gan 'antiperistaltic' հակադրորտական
Prefixoid	jer'gar 'longest' երկար	amen- <b>a</b> -jer'gar 'longest' ամենաերկար	voɪfəntʃa'tsum 'annihilation' ռչնչացում	amen- <b>a</b> -voɪfəntʃa'tsum 'annihilation of all' ամենառչնչացում
Compound	k'həlux + je'dev 'head + back' գլուխ, ետեւ	k'həlχ- <b>a</b> -je'dev 'back of head' գլխատեւ	aɪ'ves + vor'sort <sup>h</sup> 'fox + hunter' աղուէս, որսորդ	aɪ'ves- <b>a</b> -vor'sort <sup>h</sup> 'fox hunter' աղուէսաորսորդ

For these 'atypical' compounds, one can argue that the reason why there's a glottal stop is because speakers want to treat such as compounds as some grey area between a phrase and a word. In terms of phonological domains or prosody, one could argue that the glottal stop signifies a weak word boundary before the second stem.

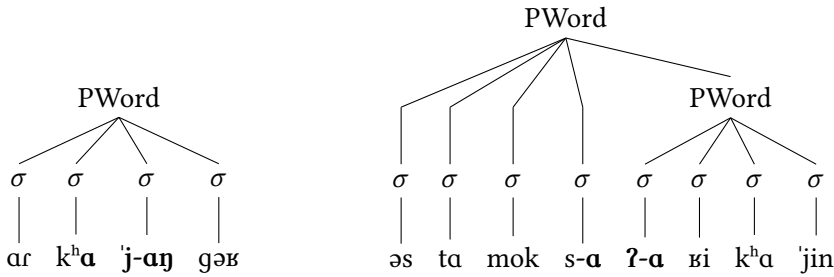
Cross-linguistically, such phenomena have been modeled using recursive prosodic structure *cite, like greeks*. For a typical compound like [ark<sup>h</sup>aj-angəx] 'king vul-ture' with glide epenthesis and a deleted linker (Table 4.87), the entire word is just



one phonological word. See Section §5.1.4 for discussion on phonological words. But for an atypical compound with an unneeded linker and a glottal stop like [əstamoks-**ɑʔ**-**ɑ**ʔik<sup>h</sup>-ɑ'jin] ‘gastrointestinal’ (Table 4.93), the entire word would act as a phonological word, while the second stem would act as an extra internal phonological word. The first stem could also be treated as its own word (Representation 2).

**Representation 2.** Prosodic structure of a typical compound vs. an atypical compound

One prosodic word in [ark<sup>h</sup>**ɑʔ**-**ɑ**ŋgəʁ] ‘king vulture’      Layered prosodic words in [əstamoks-**ɑʔ**-**ɑ**ʔik<sup>h</sup>-ɑ'jin] ‘gastrointestinal’



But it is an open question if such recursive prosodic structure is truly applicable to atypical Armenian compounds. The main problem is that typical compounds show more refined word-internal domains, discussed in [compound prosody chapter](#). Furthermore, the first stem stills shows morphophonological alternations (like vowel reduction), and these changes are arguably stem-level changes instead of word-level changes. Thus whatever prosodic boundary exists before the glottal stop, this boundary is not strong enough to prevent all stem-internal changes.

#### 4.7.4 Vowel hiatus repair before regular inflectional suffixes

There are few V-initial inflectional suffixes. Some of these suffixes are productive and can be easily added after any word: -i (G/D), -e (ABL), -ov (INS). One suffix is productive but can only take monosyllabic roots: -er (PL). Some suffixes are productive but can only follow C-final words: -ə DEF, -əs (POSS.1SG), -ə<sup>h</sup> (POSS.2SG)

Besides these productive suffixes, there is one suffix that is unproductive and can follow only a handful of roots -u (G/D). There are also some verbal inflectional suffixes like past -a, -i which we discuss in Section §4.7.5.

Based on these suffixes, we can easily examine how vowel hiatus is handled between any type of V1 and a V2 that belongs to the set {e, i, o}. We find glide

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epenthesis is the norm. Unfortunately, we can't extensively examine how vowel hiatus is handled before an inflectional /a,u/ because the data is too limited by the morphology.

##### 4.7.4.1 Stem-final /a/

First, consider words that end in /a/ (Table 4.95). Before all V-initial inflection, glide epenthesis is the regular rule. Irregularities are limited (§4.7.5).

Table 4.95: Glide epenthesis between /a/ and V-initial inflection

	Words ends in orthographic <ay> ալ			Words ends in orthographic <a> ա		
	'king'	'rosy'	'monk'	'Messiah'	'Europe'	'chemistry'
	արքայ	վարդեայ	աբեղայ	Մեսիա	Եւրոպա	քիմիա
	<ark'ay>	<varteay>	<apeɣay>	<Mesia>	<Ewroba>	<k'imia>
G/D -i	ark <sup>h</sup> a	vart <sup>h</sup> ja	ap <sup>h</sup> e'ɛa	mes'ja	jevro'ba	k <sup>h</sup> im'ja
ABL -e	ark <sup>h</sup> a'ji	vart <sup>h</sup> ja'ji	ap <sup>h</sup> eɛa'ji	mesja'ji	jevroba'ji	k <sup>h</sup> imja'ji
INS -ov	ark <sup>h</sup> a'je	vart <sup>h</sup> ja'je	ap <sup>h</sup> eɛa'je	mesja'je	jevroba'je	k <sup>h</sup> imja'je
	ark <sup>h</sup> a'jov	vart <sup>h</sup> ja'jov	ap <sup>h</sup> eɛa'jov	mesja'jov	jevroba'jov	k <sup>h</sup> imja'jov

As is clear, glide epenthesis is the norm for repair vowel sequence of /a/ plus essentially any type of inflectional vowel. This process applies after both roots like [ark<sup>h</sup>a] 'king', and after derivational suffixes like -ja in [vart<sup>h</sup>.ja] 'rosy', derived from [vart<sup>h</sup>] 'rose' վարդ.

##### 4.7.4.2 Stem-final /e/

Given a words that end in /e/ like [ro.be] 'second', if a V-initial inflectional suffix like instrumental [-ov] is added, then we get glide epenthesis: [ro.be.jov]. Glide epenthesis is the rule before all V-initial inflectional suffixes (Table 4.96).

Table 4.96: Glide epenthesis between /e/ and V-initial inflection

	'second'	'prophet'	'made of bricks'	'Cairo'
	րոպէ	մարգարէ	աղիւսէ	Գահիրէ
	ro.be	mar.k <sup>h</sup> a.re	a.ɣY.se	k <sup>h</sup> a.hi.re
G/D -i	ro.be.'ji	mar.k <sup>h</sup> a.re.'ji	a.ɣY.se.'ji	k <sup>h</sup> a.hi.re.'ji
ABL -e	ro.be.'je	mar.k <sup>h</sup> a.re.'je	a.ɣY.se.j'e	k <sup>h</sup> a.hi.re.'je
INS -ov	ro.be.'jov	mar.k <sup>h</sup> a.re.'jov	a.ɣY.se.'jov	k <sup>h</sup> a.hi.re.'jov

#### 4.7 Vowel-vowel sequences or vowel hiatus repair

All words that end in /e/ take a glide /j/ before V-initial inflection. This rule applies across native words like [robe] ‘second’ and to loanwords like [k<sup>h</sup>ahire] ‘Cairo’. Derivational suffixes also obey this rule, such as the derivational suffix -e in [aɣyse] ‘made of bricks’, derived from [aɣys] ‘brick’ աղիւս.

##### 4.7.4.3 Stem-final /i/

When /i/ is before V-initial inflection, the norm is to get glide epenthesis in Western Armenian (Table 4.97).

Table 4.97: Glide epenthesis between /i/ and V-initial inflection

	Roots with final /i/			Suffixes with final /i/		
	‘island’	‘son’	‘pigeon’	‘queen’	‘venerable’	‘apple-tree’
	կղզի	որդի	աղաւսի	թագուհի	յարգելի	խնձորենի
G/D -i	gəɣʰzi	vort <sup>h</sup> i	aɣav <sup>h</sup> ni	t <sup>h</sup> ak <sup>h</sup> u <sup>h</sup> i	hark <sup>h</sup> e <sup>h</sup> li	χəntsore <sup>h</sup> ni
ABL -e	gəɣzi <sup>h</sup> ji	vort <sup>h</sup> i <sup>h</sup> ji	aɣavni <sup>h</sup> ji	t <sup>h</sup> ak <sup>h</sup> uhi <sup>h</sup> ji	hark <sup>h</sup> eli <sup>h</sup> ji	χəntsoreni <sup>h</sup> ji
INS -ov	gəɣzi <sup>h</sup> je	vort <sup>h</sup> i <sup>h</sup> je	aɣavni <sup>h</sup> je	t <sup>h</sup> ak <sup>h</sup> uhi <sup>h</sup> je	hark <sup>h</sup> eli <sup>h</sup> je	χəntsoreni <sup>h</sup> je
	gəɣzi <sup>h</sup> jov	vort <sup>h</sup> i <sup>h</sup> jov	aɣavni <sup>h</sup> jov	t <sup>h</sup> ak <sup>h</sup> uhi <sup>h</sup> jov	hark <sup>h</sup> eli <sup>h</sup> jov	χəntsoreni <sup>h</sup> jov

Glide epenthesis applies after both roots and after all derivational suffixes. For example, glide epenthesis applies after: a) The feminine nominalizer -*uhi* as in [t<sup>h</sup>ak<sup>h</sup>-uhi] ‘queen’ derived from [t<sup>h</sup>ak<sup>h</sup>] ‘crown’ թագ. b) The deverbal adjectivizer -*i* as in [hark<sup>h</sup>el-i] ‘venerable’ derived from [hark<sup>h</sup>el] ‘to respect’ յարգել. And c) the tree-naming suffix -*eni* in [χəntsor-<sup>h</sup>eni] ‘apple tree’ derived from [χəntsor] խնձոր.

There is likewise an irregular word [tsi] ‘horse’ ձի which takes the irregular dative -*u*. Here again we get glide epenthesis: [tsi-ju].

We emphasize that glide epenthesis is the norm in Western Armenian (Table 4.98). In contrast in Eastern Armenian, stem-final /i/ usually deletes before V-initial inflection. In Eastern, the regular dative and ablative are /-i, its<sup>h</sup>/. After /i/-final stems, the Eastern dative and ablative are /-u, uts<sup>h</sup>/; Eastern likewise has a locative -*um*. Many but not all *i*-final words can lose their /i/ before these Eastern suffixes, while Western keeps the /i/.

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Table 4.98: Dialectal variation in how /i/ appears before V-initial inflection

	‘soul’	hnqḥ	‘Azeri’	ազերի
	Western	Eastern	Western	Eastern
G/D -i (WA), -u (EA)	ho'k <sup>h</sup> i	ho'k <sup>h</sup> i	aze'ri	aze'ri
ABL -e (WA), -its <sup>h</sup> , -uts <sup>h</sup> (EA)	hok <sup>h</sup> i'ji	ho'k <sup>h</sup> u	azeri'ji	azeri'ji
INS -ov	hok <sup>h</sup> i'je	ho'k <sup>h</sup> uts <sup>h</sup>	azeri'je	azeri'jits <sup>h</sup>
	hok <sup>h</sup> i'jov	ho'k <sup>h</sup> ov	azeri'jov	azeri'jov
		hok <sup>h</sup> i'jov		
LOC -um		ho'k <sup>h</sup> um		azeri'jum
		hok <sup>h</sup> i'jum		

##### 4.7.4.4 Stem-final /ə/

There are relatively few words that end in /ə/ and that can take inflection. One category of such words is the names for sounds, like [p<sup>h</sup>ə] բը to mean the sound ‘p’ or the letters բ,փ <p,p’>. Before V-initial inflection, we get glide epenthesis (Table 4.99).

Table 4.99: Glide epenthesis between /ə/ and V-initial inflection

	բը	պը	մը	հը
G/D -i	p <sup>h</sup> ə	'bə	'mə	'hə
ABL -e	p <sup>h</sup> ə'ji	bə'ji	mə'ji	hə'ji
INS -ov	p <sup>h</sup> ə'je	bə'je	mə'je	hə'je
	p <sup>h</sup> ə'jov	bə'jov	mə'jov	hə'jov

##### 4.7.4.5 Stem-final /o/

There are relatively few words that end in [o]. Before V-initial inflection, there is glide epenthesis (Table 4.100).

## 4.7 Vowel-vowel sequences or vowel hiatus repair

Table 4.100: Glide epenthesis between /o/ and V-initial inflection

	Words ends in orthographic <օ> o		Words ends in orthographic <օյ> oy	
	‘zero’ զէրօ	‘tango’ թանկօ	‘collection’ հաւաքածոյ	‘agreeable’ հաճոյ
	<zērō>	<t’angō>	<hawak’aḏzoy>	<haḏzoy>
G/D -i	ze’ro	t <sup>h</sup> an’go	havak <sup>h</sup> a’ḏzo	ha’ḏzo
ABL -e	zero’ji	t <sup>h</sup> an’go’ji	havak <sup>h</sup> a’ḏzo’ji	haḏzo’ji
INS -ov	zero’je	t <sup>h</sup> an’go’je	havak <sup>h</sup> a’ḏzo’je	haḏzo’je
	zero’jov	t <sup>h</sup> an’go’jov	havak <sup>h</sup> a’ḏzo’jov	haḏzo’jov

Glide epenthesis applies both after roots like [zero] ‘zero’, and after derivational suffixes like the nominalizer -o in [havav<sup>h</sup>a’ḏz-o] ‘collection’ that is added onto resultative participles like [havak<sup>h</sup>a’ḏz] ‘collected’ հաւաքած.

Orthographically, loanwords with final [o] tend to be spelled as <օ> o, while native words are spelled with final <օյ> nj. The reason is diachronic, as explained in Section §4.7.8.

### 4.7.4.6 Stem-final /u/

When a stem-final /u/ is before a V-initial inflectional suffix, the most common repair in Western Armenian is glide epenthesis (Table 4.101).

Table 4.101: Glide epenthesis between /u/ and V-initial inflection

	‘owl’ ռու	‘bee’ մեղու	‘sour’ թթու	‘male’ արու
	p <sup>h</sup> u	me’ku	t <sup>h</sup> ə’t <sup>h</sup> u	a’ru
G/D -i	p <sup>h</sup> u’ji	me’ku’ji	t <sup>h</sup> ə’t <sup>h</sup> u’ji	aru’ji
ABL -e	p <sup>h</sup> u’je	me’ku’je	t <sup>h</sup> ə’t <sup>h</sup> u’je	aru’je
INS -ov	p <sup>h</sup> u’jov	me’ku’jov	t <sup>h</sup> ə’t <sup>h</sup> u’jov	aru’jov

There is however dialectal variation and some degree of lexical variation (Table 4.102). In Eastern Armenian, the more typical rule is that /u/ becomes [v] (*u*-devocalization) before V-initial inflection. The [v] can then trigger schwa epenthesis. However even in Eastern Armenian, there is lexical variation in that some words use devocalization, some use glide epenthesis, and some can do both. Data is from English Wiktionary via VP. In contrast in Western Armenian, glide epenthesis is the norm.

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Table 4.102: Dialectal variation in how /u/ appears before V-initial inflection

	‘flea’		‘pilot’		‘cat’	
	Western	Eastern	Western	Eastern	Western	Eastern
G/D -i	lu	lu	ot <sup>h</sup> at <sup>h</sup> fu	ot <sup>h</sup> at <sup>h</sup> f <sup>h</sup> u	ga <sup>h</sup> du	ka <sup>h</sup> tu
	lu’ji	la’vi	ot <sup>h</sup> at <sup>h</sup> f <sup>h</sup> u’ji	ot <sup>h</sup> at <sup>h</sup> f <sup>h</sup> u <sup>h</sup> i	ga <sup>h</sup> du’ji	ka <sup>h</sup> tu <sup>h</sup> i
ABL -e (WA), -its (EA)	lu’je	la’vits <sup>h</sup>	ot <sup>h</sup> at <sup>h</sup> f <sup>h</sup> u’jits	ot <sup>h</sup> at <sup>h</sup> f <sup>h</sup> u <sup>h</sup> its <sup>h</sup>	ga <sup>h</sup> du’je	ka <sup>h</sup> tu <sup>h</sup> its
INS -ov	lu’jov	la’vov	ot <sup>h</sup> at <sup>h</sup> f <sup>h</sup> u’jov	ot <sup>h</sup> at <sup>h</sup> f <sup>h</sup> u <sup>h</sup> ov	ga <sup>h</sup> du’jov	ka <sup>h</sup> tu <sup>h</sup> ov
						ka <sup>h</sup> tu <sup>h</sup> vov

Note for the above Eastern words [ot<sup>h</sup>at<sup>h</sup>f<sup>h</sup>u] and [katu], we transcribe the inflected forms with a glide [j]. However, VP informs us that the glide in the above examples feels weaker than a full glide, thus potentially a transient glide.

In Western, the *u*-devocalization process is common when a stem-final /u/ precedes a derivational suffix (§4.7.2.5), but uncommon when it precedes an inflectional suffix. For example, [ga<sup>h</sup>du] ‘cat’ is inflected as dative [ga<sup>h</sup>du’ji] but is derived to [ga<sup>h</sup>dv-agan] ‘feline’ կատուական.

However, there are some words like the word ‘tongue’ [lezu] that show optionality in whether use devocalization or glide epenthesis (Table 4.103). In Western Armenian at least, the devoiced version has a more archaic connotation.

Table 4.103: Lexical variation in how /u/ appears before V-initial inflection

	‘tongue/language’		լեզու	
	Western		Eastern	
G/D -i	le’zu		le’zu	
	lezu’ji	lez’vi	lezu’ji	lez’vi
ABL -e (WA), -its (EA)	lezu’je	lez’ve	lezu’jits <sup>h</sup>	lez’vits <sup>h</sup>
INS -ov	lezu’jov	lez’vov	lezu’jov	lez’vov

The devoiced form is impressionistically more common in high-frequency collocations or sayings or proverbs (1).

- (1) lezv-i-t<sup>h</sup>                      dag   p<sup>h</sup>an-mə   g-a-Ø  
 tongue-GEN-POSS.2SG under thing-INDF exist-TH-3SG  
 Literally: ‘There is something under your thing’  
 Meaning: ‘There is something that you want to say but you’re having trouble it.’  
 Լեզուիդ տակ բան մը կայ:

## 4.7.5 Vowel hiatus repair in irregular inflection and verbal inflection

When a vowel-final stem gets a vowel-initial regular inflectional suffix, then the normal way to resolve the vowel sequence is to use glide epenthesis (§4.7.4). However, irregular inflection uses different strategies.

There are a handful of irregular words that end in /a/: [dəʁa] ‘boy’ տղայ and [dʒamp<sup>h</sup>a] ‘road’ ճամբայ. In standard speech, the vowel is irregularly deleted before irregular inflectional suffixes: [dəʁ-otʰs] ‘boy-PL.GEN’ տղոց and [dʒamp<sup>h</sup>-u] ‘road-GEN’ ճամբու. But in colloquial speech, we can use regular inflectional suffix and potentially glide epenthesis: [dəʁa-nɛɾ-u] ‘boy-PL-GEN’ տղաներու and [dʒamp<sup>h</sup>aj-i] ‘road-GEN’ ճամբայի. Fuller declension classes for these irregular words are found in [cite chapter declension irregular](#).

For the irregular word [dʒamp<sup>h</sup>a] ‘road’, it likewise has derived words where the [a] is deleted: [dʒamp<sup>h</sup>-ort<sup>h</sup>] ‘traveller’ ճամբորդ or [dʒamp<sup>h</sup>-el] ‘to send away’ ճամբել.

The country-naming suffix -ja -իա follows its own declension class: [əspan-ja] ‘Spain’ Սպանիա but [əs]. In standard speech, the [a] is deleted and replaced by a dative-genitive suffix -o: [əspan-jo] ‘Spain-GEN’ Սպանիոյ. In colloquial speech, we can use the regular suffix -i and take a glide: [əspan-jaj-i] Սպանիայի. This declension class is discussed more in [cite chapter declension irregular](#).

Some words of time take an irregular dative-genitive suffix -va. This suffix deletes the stem-final vowel or changes it to a schwa. For example, [ardu] ‘morning’ արտու but [ardə-va] արտուայ, and [dari] ‘year’ տարի but [dar-va] տարուայ. This is discussed more in [cite chapter declension irregular](#).

Among verbs, we find very few cases of clear vowel hiatus repair. The clearest is when the past suffix -i is added after the theme vowels [-e-, -a-] and triggers a glide. For example for [-e-], [jerk<sup>h</sup>-e-n] ‘sing-TH-3PL’ meaning ‘they sing’ երգեն, and its past form [jerk<sup>h</sup>-ej-i-n] ‘sing-TH-PST-3PL’ meaning ‘if they were singing’ երգէին. Similarly for the theme vowel [a]: [gart<sup>h</sup>-a-n] ‘read-TH-3PL’ meaning ‘they read’ կարդան, and its past form [gart<sup>h</sup>-aj-i-n] ‘read-TH-PST-3PL’ meaning ‘if they were reading’ կարդային.

An unclear case involves irregular past inflection. For irregular words in the past perfective, the past markers [a,i] never follow a theme. For example, [p<sup>h</sup>er-e-n] ‘bring-TH-3PL’ meaning ‘they bring’ բերեն but [p<sup>h</sup>ər-i-n] ‘bring-PST-3PL’ meaning ‘they brought’ բերին. It is unclear if this is because the [-i] suffix deletes theme vowels, or if the morphology just never added the theme vowel here. Irregular verbal past marking is discussed more in [cite chapter verb irregular](#).

## 4.7.6 Vowel hiatus repair before clitics

Armenian has few V-initial clitics (Table 4.104). These are the ‘also’ clitic [al] ալ and the copula [e] է that can take on various inflected forms like present 1SG [em] եմ, past 1SG [eji] էի, and so on. When these clitics are added after a V-final word, we get glide epenthesis.

Table 4.104: Glide epenthesis between before V-initial clitics

	+/al/ ‘also’ ալ		+/e/ ‘is’ է		
/a/	və'ga	və'gajal	və'gaje	‘witness’	վկայ
/e/	kʰə've	kʰə'vejal	kʰə'veje	‘vote’	քուէ
/i/	le'xi	le'xijal	le'xije	‘bitter’	լեղի
/ə/	've	'vajal	'vaje	‘/v/ sound’	վը
/o/	kiʰ'lo	kiʰ'lojal	kiʰ'loje	‘kilogram’	քիլոյ
/o/	gə'dzu	gə'dzujal	gə'dzuje	‘spicy’	կծու

One exception is the indefinite suffix [mə] մը. Before a clitic, it changes its form to [mən]. See **indefinite floating** But in more archaic speech, the [mə] is reduced to [m]. **find reference from an old grammar bcz impossible to find online [me] forms**

- (2) kʰitʃ-mən=al    anufexen (modern: HD)  
 kʰitʃ-m=al    anufexen (archaic)  
 little-INDF=also sweets  
 ‘And a bit of sweets.’<sup>10</sup>  
 Զիչ մըն ալ  
 Զիչ մ'ալ անուշեղէն

## 4.7.7 Overapplication of vowel hiatus repair

We went through various rules for vowel hiatus repair like vowel deletion or glide epenthesis. In general, such rules apply when two vowels become next to each because of the morphology. But there are corners of the grammar where these rules overapply even though there's no vowel sequence. The overapplication is because of a mix of morphological and diachronic factors. The corners are passives (§4.7.7.1) and /j/-initial suffixes (§4.7.7.2).

<sup>10</sup>For the [m-al] form, the archaic sentence was taken from the title of an article from 1900; URL: <https://arar.sci.am/dlibra/publication/74562/edition/67396/>.



## 4.7.7.1 Overapplication of glide epenthesis in passives

For passives, the passive suffix is a consonant /v/. But after /a/-final roots, a glide is epenthesized and written in the orthography. For example, from the root <vgay> [vəgɑ] ‘witness’ վկայ, we can form a passive verb <vgayowil> [vəgɑj-v-i-l] ‘to be testified’ վկայուի. The reason this glide appears is because of two reasons, one diachronic and one synchronic.

The diachronic reason is that the modern passive suffix /v/ was historically a vowel \*/-u-/ in Classical Armenian. Thus vowel hiatus was created in Classical Armenian, and thus we got a glide. The synchronic reason is that the change from a vocalic morpheme \*/-u-/ to a consonantal morpheme [-v-] was accompanied by a huge reanalysis of passive morphophonology. Briefly put, passive stems try to resemble active stems, even if that means a glide is unnecessarily added: <vgayel> [vəgɑj-e-l] ‘to testify’ վկայել. The need for resemblances affects many other morphophonological changes such as vowel reduction. This passive problem is discussed in depth in [passive phonology chapter](#).

## 4.7.7.2 Vowel hiatus repair before /j/-initial suffixes

For /j/-initial suffixes, these suffixes are pronounced with an initial glide, but they are spelled with an initial vowel (Table 4.105). For example, the suffix /-ja/ is spelled as <eay> in the word <ayiweay> [ɑys-ja] ‘made of brick’ աղիւսեայ, derived from the word <ayiws> [ɑys] ‘brick’ աղիւս. When added to a vowel-final stem, the vowel undergoes alternations as if the /j/ were a vowel. Such changes include deletion or de-vocalization.

Table 4.105: Overapplication of vowel hiatus repair before /j/-initial suffixes

/a-j/ →[j]	<giwt'era> <giwt'erean>	gɪtʰe'ra gɪtʰer-'jan	‘Cythera’ ‘Cytherean’	Կիթերա Կիթերեան
/u-j/ →[vj]	<brdow> <brdoweay> <pazmalezow> <pazmalezowean>	bər'du bərd'v-ja pʰazmale'zu pʰazmalez'v-jan	‘payprus’ ‘made of papyrus’ ‘polyglot’ ‘polyglot’	պրոսու պրոսուեայ բազմալեզու բազմալեզուեան
/i-j/ →[j]	<kini> <kineag> <əndani> <əndaneōk'>	kʰi'ni kʰin-'jag ənda'ni əndan-'jokʰ	‘wine’ ‘sour wine’ ‘familiar’ ‘familiarly’	գինի գինեակ ընտանի ընտանեօք
/e-j/ →[j]	<ap'rotidē> <ap'rotidean>	apʰrotʰi'de apʰrotʰid-'jan	‘Aphrodite’ ‘venereal’	Ափրոդիտէ ափրոդիտեան

#### 4 Syllable structure

No such changes typically happen after /a/ or /e/ (Table 4.106). This is because, as explained in Section §4.7.2, such vowels usually take glide epenthesis before vowel-initial suffixes. The glide of the suffix here does the job of the epenthetic glide.

Table 4.106: No application of of vowel hiatus repair between /a,e/ and a /j/-initial suffix

/a-j/	<ark'ay>	ar'k <sup>h</sup> a	'king'	արքայ
→[aj]	<arkayean>	ark <sup>h</sup> a-'jan	'royal'	արքայեան
	<norəndzay>	norən'dz <sup>h</sup> a	'novice'	նորընծայ
→[aj]	<norəndzayeal>	norəndz <sup>h</sup> a-'jal	'novice'	նորընծայեալ
	<yutay>	hu't <sup>h</sup> a	'Judas'	Յուդայ
→[aj]	<yutayean>	hut <sup>h</sup> a-'jan	'Judaical'	յուդայեան
/e-j/	<hiwlē>	hy'le	'atom'	հիլլէ
→[ej]	<eōtn'hiwlēean>	jot <sup>h</sup> nəhy <sup>h</sup> le-'jan	'heptatomic'	եօթնհիլլէեան

We have found many words where a /j/-initial suffix was added to a /i/-final word, and then the /i/ is deleted (Table 4.107).

Table 4.107: Deletion of /i/ before a /j/-initial suffix

<foki>	fok <sup>h</sup> i	'vapor'	շոգի	<badani>	bada'ni	'adolescent'	պատանի
<fokeag>	fok <sup>h</sup> -'jag	'light vapor'	շոգեալ	<badaneag>	badan-'jag	'adolescent'	պատանեալ
<yori>	ho'ri	'evil'	յոդի	<dēruni>	deru'ni	'dominical'	տէրութի
<yoreag>	hor-'jag	'wicked'	յոռեալ	<dērunean>	derun-'jan	'dominical'	տէրութեան
<d̥z̥d̥zi>	d̥z̥ə'd̥zi	'worm'	ճճի	<madani>	mada'ni	'ring'	մատանի
<d̥z̥d̥zeag>	d̥z̥ə'd̥z̥-'jag	'animalcule'	ճճեալ	<madaneag>	madan-'jag	'small ring'	մատանեալ
<orti>	vort <sup>h</sup> i	'son'	որդի	<gyzi>	gəx'zi	'island'	կղզի
<orteag>	vort <sup>h</sup> -'jag	'little child'	որդեալ	<gyzeag>	gəx'z-'jag	'islet'	կղզեալ

For /i/-final roots, many but not all of the above suffixes are [jag], such as [fok<sup>h</sup>jag] 'light vapor'. This suffix could be reanalyzed as just the root plus the diminutive suffix /aq/. The underlying form could thus be either /fok<sup>h</sup>i-jag/ or /fok<sup>h</sup>i-aq/. With the latter form, the /i/ becomes [j] before a vowel. Such a reanalysis however does not work for words that end in sequences like [jan].

As is clear, for some reason, the /j/-initial suffixes act like vowel-initial suffixes and they trigger vowel hiatus rules like /i/-deletion. But why do they do this? The answer is likely diachronic. The fact these suffixes are spelled with an <e> suggests that in Classical Armenian, these /j/-initial suffixes were pronounced as \*/e/-initial suffixes. They would then transparently trigger vowel hiatus repair rules. Over time, the ancient \*/e/ became a modern /j/. This sound change

required Armenian speakers to reanalyze these /j/-initial suffixes as arbitrarily requiring that the preceding vowel is deleted, de-vocalized, or be left unchanged.

One could perhaps argue that the data above suggests that modern speakers still treat the /j/-initial suffixes as underlyingly /e/-initial. That is, perhaps a suffix like [-jag] is actually /-eag/. We don't think such an analysis is realistic however as we explain below.

In the *Kouyoumdjian* dictionary, we found around 1430 words which end in a /j/-initial suffix. Thus these suffixes are relatively common and productive. However, we only found 27 words such that a) the word had such a suffix, and b) the word was clearly derived from a vowel-final stem. Condition (b) is important. Such derived words are all extremely-low frequency words, and they are often high-register technical words or liturgical words. The Armenian child is unlikely to be systematically exposed to such derived words in their formative years. Based on this statistical skew, we suspect that the Armenian child will at first treat the /j/-initial suffixes like [-jag] as truly just underlyingly /-jag/, without any abstraction.

In HD's impression, knowing how to morphologically form such derived words and how to pronounce them is something that the child is exposed to later in life at school or church. The child then learns that these /j/-initial suffixes for unknown reasons trigger vowel hiatus repair on the preceding vowel.

#### 4.7.8 Diachronic problems in glide epenthesis

For vowel hiatus, glide epenthesis is a common rule. However, glide epenthesis has an intricate connection with the history of glide deletion in Armenian.

In modern Armenian, there are many native words that are pronounced with a final [ɑ] or [o], but that are spelled with a final glide: <ark'ay> [arkʰɑ] 'king' արքայ or <xəfoy> [χɑfɔ] 'broth' խաֆոյ. Such final glides are silent letters. In contrast, relatively few words are spelled with a final <a> ա, <ō> օ, or <o> ո. For example, <fransa> [fəransɑ] 'France' ֆրանսա, [dzo] <dzo> 'an interjection' ծօ, <vet'o> [vetʰo] 'veto' վեթո. Such words are usually either loanwords, interjections, or have a country-naming suffix -ja.

The reason for this state of affairs is because in Classical Armenian, these silent letters were pronounced. In the change from Classical Armenian to Modern Armenian, the final glide was deleted from polysyllabic words, while it was kept in monosyllabic words, or in compounds where the second stem was monosyllabic. In Table 4.108, we transcribe the Classical Words using the 'pronunciation rules' that modern Western Armenian speakers would use to read Classical texts. We ultimately don't know how Classical Armenian was exactly pronounced.

#### 4 Syllable structure

Table 4.108: Diachronic loss of final glides for polysyllabic words

	‘king’ <ark’ay>	‘broth’ <xafoy>	‘Armenian’ <hay>	‘Latinized Armenian’ <ladinahay>	‘ram’ <xoy>
Classical	[ark <sup>h</sup> aj]	[χa <sup>h</sup> oj]	[ <sup>h</sup> haj]	[ladin-a- <sup>h</sup> haj]	[χoj]
Modern	[ark <sup>h</sup> a]	[χa <sup>h</sup> o]	[ <sup>h</sup> haj]	[ladin-a- <sup>h</sup> haj]	[χoj]
	արքայ	խաշոյ	հայ	լատինահայ	խոյ

In contrast, Classical Armenian seems to not have many words that are spelled with a final <a> or <ō>. For <a>, one of the few examples we found on the Calfa dictionary was <alk’imia> [alk<sup>h</sup>imja] ‘alchemy’ ալքիմիա, an obvious loanword.<sup>11</sup> For <ō>, this letter did not exist in Classical Armenian. The final <o> n is also pretty rare in Classical: <ayo> [ajo] ‘yes’ այո.

When a modern Western speaker uses a word like [ark<sup>h</sup>a] ‘king’, the final silent glide <y> is present in the spelling <ark’ay> արքայ but it not present in the lexical representation /ark<sup>h</sup>a/. When a vowel-initial suffix is added, a glide is inserted: [ark<sup>h</sup>aj-i] ‘king-GEN’ արքայի. This complicated diachronic sequence of deleting a final glide and then inserting an epenthetic glide constitutes a type of rule inversion (Vennemann 1972), which is common in historical linguistics.

Given these historical facts, some argue that words like [ark<sup>h</sup>a] <ark’ay> ‘king’ are underlyingly glide-final /ark<sup>h</sup>aj/ in order to explain why the glide surfaces before vowels: [arkaji] (G/D) cite **vaux**. But this psychologically unrealistic and unneeded for various reasons.

First, words that are spelled without a glide like [jevroba] <ewroba> ‘Europe’ show the same epenthetic glide in inflection: [jevrobaji] (G/D). They may differ before derivational morphology, but such variation is for independent reasons (§4.7.2.1).

Second, the Kouyoumdjian dictionary lists 294 words that end in an orthography <a> ա and pronounced as [a], and 708 words that end in an orthographic <ay> այ and pronounced as [a].

Third, the reformed orthography does not spell these final deleted glides: reformed spelling <ark’a> արքա vs. traditional <ark’ay> արքայ. The orthographic reform was likely guided by the reformers intuition that these silent glides are phonologically absent.

A related fourth point is that some loanwords are variably spelled with a glide (like a native word), or without a glide (like a typical loanword). For example, [zero] ‘zero’ can be <zēroy> զէրոյ or <zērō> զէրո. There’s no reason to suspect that these alternating spellings mean there’s any difference in their phonology.

<sup>11</sup><https://dictionary.calfa.fr/entries/>

Fifth, this unwritten glide is completely invisible to other inflectional suffixes. The definite suffix is /-ə/ after consonants, but /-n/ after vowels. Words like [ark<sup>h</sup>ɑ] are transparently treated as vowel-final and take the definite form [ark<sup>h</sup>ɑ-n]. The orthography deletes this glide before consonant-initial inflectional suffixes like the definite <ark'an> արքան and the plural [ark<sup>h</sup>ɑ-ner] <ark'aner> արքաներ.

Thus, the Armenian child really has no reason to treat this glide as anything other than an inserted glide. They have no reason to postulate that most cases of final [ɑ] are underlyingly /ɑj/ with a rule of deleting final glides.

Note that this diachronic-synchronic problem has an interesting interaction with morphology. Consider the word <bargay> [barga] 'Fatal Sister' Պարկայ, a Greek mythological character. The plural marker in Classical was *-k<sup>h</sup> -p*. The modern language uses this suffix as a nominalizer instead. When these nominalizers are added after a silent glide, speakers recognize the 'learned' or 'archaic' nature of this rule, and would pronounce the glide because they're reading the silent glide: <bargayk'> [bargaɟk<sup>h</sup>] 'The Fate sisters' Պարկայք.



## 5 Suprasegmental phonology of word stress

Western Armenian is often described as having regular final stress (§5.1). Suffixation and compounding triggers stress shift. Based on stress, we can demarcate the right boundary of prosodic words (§5.1.4). Regular primary stress is thus final and quantity-insensitive.

The main phonological exception is when the word ends in one or two schwas (§5.1.2). In that case, stress retracts to the rightmost non-schwa vowel. Complications arise for words that only have schwas (§5.1.3).

Single clitics are ignored by stress (§5.2). But multiple clitics can trigger stress shift in certain syntactic-morphological contexts.

The above concerns regular primary stress. There are irregularities in that certain morphemes exceptionally assign non-final stress. This includes prestressing suffixes (§5.3), negation (§5.4), and other morphemes. The irregular stress of these irregular morphemes can interact with the stress of suffixes, clitics, and each other.

Besides those morphemes, there are some words which have irregular non-final stress (§5.5). These are mostly high-frequency functional words. These few words are just exceptions.

Armenian is also often described as having initial secondary stress (§5.6). However, sources also disagree on whether initial schwas can avoid secondary stress. But in general, initial secondary stress is not really perceptible to speakers thus any generalizations on initial secondary stress aren't truly reliable. In contrast, secondary stress caused by the morphology (such as prefixes) is perceptible. Regardless of the alleged existence of initial secondary stress, stress is thus not iterative.

For reference, Table 5.1 provides examples of different morpho-phonological contexts for stress. For clarity, we use bolding to show stress syllables in this section.

## 5 Suprasegmental phonology of word stress

Table 5.1: Overview of stress patterns in Western Armenian

Type		Morphemes	Translation	
<b>Regular final stress</b>				
Root	k <sup>h</sup> a'ʁak <sup>h</sup>	city	‘city’	քաղաք
Derivational suffix	k <sup>h</sup> aʁak <sup>h</sup> -a'tsi	city-NMLZ	‘citizen’	քաղաքացի
Inflectional suffix	k <sup>h</sup> aʁak <sup>h</sup> -a'tsi- <b>ner</b>	city-NMLZ-PL	‘citizens’	քաղաքացիներ
Clitic avoidance	k <sup>h</sup> a'ʁak <sup>h</sup> =aɫ=e	city=also=is	‘is also city’	քաղաք ալ է
Compound	majr-a-k <sup>h</sup> a'ʁak <sup>h</sup>	mother-LV-city	‘capital’	մայրաքաղաք
<b>Schwa avoidance in primary stress</b>				
Penult stress	k <sup>h</sup> a'ʁak <sup>h</sup> -ə	city-DEF	‘the city’	քաղաքը
Antepenult stress	k <sup>h</sup> aʁən-mə	lamb-INDF	‘a lamb’	գառն մը
Last-resort stress	fəstəχ	pistachio	‘pistachio’	ֆստըխ
Root-stress	fəstəχ-ə	pistachio-DEF	‘the pistachio’	ֆստըխը
	fəstəχ-ov	pistachio-INS	‘with pistachio’	ֆստըխով
<b>Morphemes with irregular stress</b>				
Initial stress	tʃ-okn-er	NEG-help-CN	‘he doesn’t help’	չ'օգնէր
Prestressing	'vets-erort <sup>h</sup>	six-ORDINAL	‘sixth’	վեցերորդ
Loss of prestressing	vets-e'ror <sup>h</sup> -ə	six-ORDINAL-DEF	‘the sixth’	վեցերորդը
Irregular word	'nujn-k <sup>h</sup> an	same-than	‘as much’	նոյնքան
<b>Morphemes with irregular stress</b>				
Alleged initial stress	,gare'li	possible	‘possible’	կարելի
Prefix stress	,aŋ-gare'li	NG-possible	‘impossible’	անկարելի

## 5.1 Regular lexical stress

### 5.1.1 Regular final stress on non-schwa vowels

Regular primary stress is placed on the syllable of the word if that syllable has a non-schwa vowel (Table 5.2). Final stress can be placed on any type of non-schwa vowel.



Table 5.2: Regular final stress is blind to type of non-schwa vowel

/ɑ/	ɑ'kah	'stingy'	je'raz	'dream'	if'χan	'prince'
		ազահ		երազ		իշխան
/e/	p <sup>h</sup> ɑ'rev	'hello'	tso'ren	'wheat'	u'βεε	'brain'
		բարեւ		ցորեն		ուղեղ
/i/	ga'tsin	'axe'	t <sup>h</sup> e'βin	'yellow'	vo'dʒir	'crime'
		կացին		դեղին		ոճիր
/o/	ba'ron	'baron'	χe'lok <sup>h</sup>	'obedient'	χo'for	'huge'
		պարոն		խելօք		խոշոր
/u/	ɑ'fun	'autumn'	he'βug	'liquid'	ɑ'bur	'soup'
		աշուն		հեղուկ		սպուր
/ɣ/	ɑ'lyr	'flour'	mər'tʃɣn	'ant'	ɑ'rydz	'lion'
		ալիւր		մրջին		առիւծ

Final stress ignores syllable structure. The final syllable can be a closed CVC as in Table 5.2, or open CV or closed CVCC as in Table 5.3.

Table 5.3: Regular final stress is blind to type of syllable structure

/ɑ/	p <sup>h</sup> e'sa	'groom'	ga'βant <sup>h</sup>	'Christmas'
		փեսայ		կաղանդ
/e/	has'tse	'address'	ha'mest	'modest'
		հասցէ		համեստ
/i/	hə'βi	'pregnant'	na'rintʃ	'orange'
		յղի		նարինջ
/o/	k <sup>h</sup> i'lo	'kilogram'	ɑ'rox'tʃ	'healthy'
		քիլոյ		առողջ
/u/	ɑ'ru	'male'	ɑ'gump <sup>h</sup>	'club'
		արու		ակումբ
/ɣ/	N/A		ɑr't <sup>h</sup> ɣɣk <sup>h</sup>	'result'
				արդիւնք

Final stress applies regardless of word-size (Table 5.4). The above data concerned bisyllabic roots. Although rare, there are some roots that are trisyllabic. We find final stress in larger roots.

## 5 Suprasegmental phonology of word stress

Table 5.4: Regular final stress in trisyllabic roots

aba'k <sup>h</sup> a	'future'	ապագայ
ak <sup>h</sup> a'rag	'farm'	ագարակ
jeza'gi	'singular'	եզակի
ara'k <sup>h</sup> il	'stork'	արագիլ
aba'hov	'safe'	ապահով
p <sup>h</sup> ap <sup>h</sup> e'lon	'Babylon'	Բաբելոն

Suffixation creates longer words and we find stress shift (Table 5.5). It doesn't matter whether the suffix is derivational or inflection, monosyllabic or bisyllabic, ending in a consonant or not. Compounding likewise creates larger words. We again see regular final stress in compounds.

Table 5.5: Regular final stress in suffixation and compounding

Root 'sugar':	fak <sup>h</sup> ar	-PL fak <sup>h</sup> ar-'ner	-PL-ABL fak <sup>h</sup> ar-ne'r-e
Derivative 'sweet'	zəpəp fak <sup>h</sup> ar-od	zəpəpənər fak <sup>h</sup> ar-od-'ner	zəpəpənərət fak <sup>h</sup> ar-od-ne'r-e
Derivative 'sweets'	zəpəpəpəp fak <sup>h</sup> ar-e'xen	zəpəpəpənər fak <sup>h</sup> ar-e'xen-'ner	zəpəpəpənərət fak <sup>h</sup> ar-e'xen-ne'r-e
Root 'market'	va'dzar վաճառ	va'dzar-'ner վաճառներ	va'dzar-ne'r-e վաճառներ
Derivative 'merchant'	va'dzar-a'gan վաճառական	va'dzar-agan-'ner վաճառականներ	va'dzar-agan-ne'r-e վաճառականներ
Derivative 'commercial'	va'dzar-agan-ut <sup>h</sup> jyn վաճառականություն	va'dzar-agan-ut <sup>h</sup> jyn-'ner վաճառականություններ	va'dzar-agan-ut <sup>h</sup> jyn-ne'r-e վաճառականություններ
Compound 'sugar-trader'	fakar-a-va'dzar շաքարավաճառ	fakar-a-va'dzar-'ner շաքարավաճառներ	fakar-a-va'dzar-ne'r-e շաքարավաճառներ

In sum, primary stress is regularly final. Regular final stress is also the norm for Eastern Armenian. However, there are some non-standard dialects which have penultimate stress as the norm. (Vaux 1998: 134-6,199). For a study on the diachronic development of these penultimate-stress dialects from the final-stress dialects, see DeLisi (2018).

### 5.1.2 Regular non-final stress for final schwas

The previous section focused on words where the final syllable had a non-schwa vowel. The main phonological exception to final stress comes from final schwas

(Table 5.6). If the final syllable has a schwa, then stress is on the rightmost non-schwa vowel. Throughout this grammar, we use the label ‘full vowel’ to denote non-schwa vowels.

Table 5.6: Non-final stress when the final syllable has a schwa

$k^h a' \mathfrak{a} k^h$	city	‘city’	քաղաք
$k^h a' \mathfrak{a} k^h - \partial$	city-DEF	‘the city’	քաղաքը
$k^h a' \mathfrak{a} k^h - \partial s$	city-POSS.1SG	‘my city’	քաղաքս
$k^h a' \mathfrak{a} k^h - \partial t^h$	city-POSS.2SG	‘your.SG city’	քաղաքդ
$k^h a' \mathfrak{a} k^h - m \partial$	city-INDF	‘a city’	քաղաք մը

For non-final stress, the most common situation when the final syllable has a schwa, and the penultimate syllable has a non-schwa. Stress is then on this non-schwa. This type of configuration is often found when the word has one the four following schwa-headed suffixes: the definite  $-\partial$ , possessive suffixes  $-\partial s$ ,  $-\partial t^h$ , and indefinite suffix  $-m \partial$ .<sup>1</sup>

When a word with final stress takes any of the above 4 suffixes, we always see penultimate stress (Table 5.7). Penultimate stress can land on any type of non-schwa vowel as long as that vowel precedes a schwa. Penultimate stress can be on either a closed or open syllable.

<sup>1</sup>The indefinite morpheme  $-m \partial$  is sometimes called a clitic in the literature (cite sigler). We think this is because this morpheme is spelled with a space before it. But to our knowledge, there’s no non-orthographic evidence for calling it a clitic instead of a suffix.

## 5 Suprasegmental phonology of word stress

Table 5.7: Penultimate stress when a schwa-headed suffix is added

			Definite -ը	1sg poss. -ս	Indefinite մը	
/ɑ/	<b>k<sup>h</sup>am</b>	գամ	<b>k<sup>h</sup>a.m-ə</b>	<b>k<sup>h</sup>a.m-əs</b>	<b>k<sup>h</sup>am.-mə</b>	‘nail’
	<b>p<sup>h</sup>and</b>	բանտ	<b>p<sup>h</sup>an.d-ə</b>	<b>p<sup>h</sup>an.d-əs</b>	<b>p<sup>h</sup>and.-mə</b>	‘prison’
	<b>a<sup>h</sup>radz</b>	առած	<b>a<sup>h</sup>ra.-dzə</b>	<b>a<sup>h</sup>ra.-dzəs</b>	<b>a<sup>h</sup>radz.-mə</b>	‘proverb’
/e/	<b>t<sup>h</sup>ev</b>	թեւ	<b>t<sup>h</sup>e.v-ə</b>	<b>t<sup>h</sup>e.v-əs</b>	<b>t<sup>h</sup>ev.-mə</b>	‘arm’
	<b>t<sup>h</sup>ert<sup>h</sup></b>	թերթ	<b>t<sup>h</sup>er.t<sup>h</sup>-ə</b>	<b>t<sup>h</sup>er.t<sup>h</sup>-əs</b>	<b>t<sup>h</sup>ert<sup>h</sup>.-mə</b>	‘newspaper’
	<b>ar<sup>h</sup>vest</b>	արուեստ	<b>ar<sup>h</sup>ves.t-ə</b>	<b>ar<sup>h</sup>ves.t-əs</b>	<b>ar<sup>h</sup>vest.-mə</b>	‘handicraft’
/i/	<b>li<sup>h</sup>dʒ</b>	լիճ	<b>li.dʒ-ə</b>	<b>li.dʒ-əs</b>	<b>li<sup>h</sup>dʒ.-mə</b>	‘lake’
	<b>mir<sup>h</sup>k<sup>h</sup></b>	միրգ	<b>mir.k<sup>h</sup>-ə</b>	<b>mir.k<sup>h</sup>-əs</b>	<b>mir<sup>h</sup>k<sup>h</sup>.-mə</b>	‘fruit’
	<b>ara<sup>h</sup>k<sup>h</sup>il</b>	արագիլ	<b>ara.k<sup>h</sup>i.l-ə</b>	<b>ara.k<sup>h</sup>i.l-əs</b>	<b>ara.k<sup>h</sup>il.-mə</b>	‘stork’
/o/	<b>ots</b>	օձ	<b>o.ts-ə</b>	<b>o.ts-əs</b>	<b>ots.-mə</b>	‘snake’
	<b>vor<sup>h</sup>p<sup>h</sup></b>	որբ	<b>vor.p<sup>h</sup>-ə</b>	<b>vor.p<sup>h</sup>-əs</b>	<b>vor<sup>h</sup>p<sup>h</sup>.-mə</b>	‘orphan’
	<b>sar<sup>h</sup>mos</b>	սարմոս	<b>sar<sup>h</sup>mo.s-ə</b>	<b>sar<sup>h</sup>mo.s-əs</b>	<b>sar<sup>h</sup>mos.-mə</b>	‘psalm’
/u/	<b>p<sup>h</sup>ul</b>	փուլ	<b>p<sup>h</sup>u.l-ə</b>	<b>p<sup>h</sup>u.l-əs</b>	<b>p<sup>h</sup>ul.-mə</b>	‘phase’
	<b>mur<sup>h</sup>dʒ</b>	մուրճ	<b>mur.dʒ-ə</b>	<b>mur.dʒ-əs</b>	<b>mur<sup>h</sup>dʒ.-mə</b>	‘hammer’
	<b>χa<sup>h</sup>nut<sup>h</sup></b>	խանութ	<b>χa<sup>h</sup>nu.t<sup>h</sup>-ə</b>	<b>χa<sup>h</sup>nu.t<sup>h</sup>-əs</b>	<b>χa<sup>h</sup>nut<sup>h</sup>.-mə</b>	‘store’
/ɣ/	<b>dʒɣɐ</b>	ճիւղ	<b>dʒɣ.ɐ-ə</b>	<b>dʒɣ.ɐ-əs</b>	<b>dʒɣɐ.-mə</b>	‘branch’
	<b>a<sup>h</sup>rydz</b>	առիւծ	<b>a<sup>h</sup>ry.dz-ə</b>	<b>a<sup>h</sup>ry.dz-əs</b>	<b>a<sup>h</sup>rydz.-mə</b>	‘lion’

There is another common construction where we find non-final stress (Table 5.8). There are roots where the final syllable has a schwa, while the penult has a full vowel. For some of these words, the schwa is optional and variable across speakers. But if this schwa is present, stress is on the penult.<sup>2</sup>

Table 5.8: Penultimate stress when the final root syllable has a schwa, while penult has full vowel

/mexɛr/	<b>‘mexər</b>	‘honey’	մեղր	<meyr>
	<b>‘mexr</b>			
/k <sup>h</sup> arn/	<b>‘k<sup>h</sup>arən</b>	‘lamb’	գառն	<karn>
	<b>‘k<sup>h</sup>arn</b>			
/himn/	<b>‘himən</b>	‘basis’	հիմն	<himn>
/p <sup>h</sup> artsɛr/	<b>‘p<sup>h</sup>artsər</b>	‘high’	բարձր	<partsr>
/k <sup>h</sup> anitsɛs/	<b>k<sup>h</sup>a<sup>h</sup>nitsəs</b>	‘often’	քանիցս	<k <sup>h</sup> anits <sup>h</sup> s>
/χarn/	<b>‘χarən</b>	‘mixed’	խառն	<xarn>
	<b>‘χarn</b>			
/vart <sup>h</sup> -a-χarn/	<b>vart<sup>h</sup>-a-‘χarən</b>	‘mixed with roses’	վարդախառն	<vartaxarn>
	<b>vart<sup>h</sup>-a-‘χarn</b>			

<sup>2</sup>The word *vart<sup>h</sup>-a-χarən* ‘mixed with roses’ is a compound of *vart<sup>h</sup>* ‘rose’ and *χarən* ‘mixed’. The *-a-* is a linking vowel.

In these words, the schwa is arguably epenthetic ([cite chapter](#)). The main evidence for this is that 1) the schwa is absent in the orthography, and 2) the schwa is absent in derived forms in standard speech. The evidence for schwa epenthesis is discussed elsewhere in ([cite chapter](#)).

For the above words with an epenthetic schwa, stress is on the penultimate syllable. That penult syllable has a full vowel. If a schwa-headed suffix is added like indefinite *-mə*, we find stress on the same syllable, but now it's further back in the word on the now antepenult syllable. If we had a suffix with a non-schwa like genitive *-i*, then we see the expected final stress (Table 5.9).

Table 5.9: Antepenultimate stress when the penult root syllable and suffix syllable have schwas, while antepenult has full vowel

	+ indefinite	+ definite	+ 1 <sup>st</sup> possessive	+ genitive
'honey'	<b>'mexər-mə</b>	<b>'mexr-ə</b>	<b>'mexr-əs</b>	<b>'mexər-i</b>
		<b>'mexər-ə</b>	<b>'mexər-əs</b>	<b>'mexər-i</b>
	մեղր մը	մեղր	մեղրս	մեղրի
'lamb'	<b>'kʰarən-mə</b>	<b>'kʰarn-ə</b>	<b>'kʰarn-əs</b>	<b>kʰar'n-i</b>
	գառն մը	գառնը	գառնս	գառնի
'basis'	<b>'himən-ə</b>	<b>'himn-ə</b>	<b>'himn-əs</b>	<b>him'n-i</b>
	հիմն մը	հիմնը	հիմնս	հիմնի
'high'	<b>'pʰartsər-mə</b>	<b>'pʰartsr-ə</b>	<b>'pʰartsr-əs</b>	<b>pʰarts'r-i</b>
		<b>'pʰartsər-ə</b>	<b>'pʰartsər-əs</b>	<b>pʰarts'r-i</b>
	բարձր մը	բարձրը	բարձրս	բարձրի
'mixed'	<b>'χarən-mə</b>	<b>'χarn-ə</b>	<b>'χarn-əs</b>	<b>χar'n-i</b>
		<b>'χarən-ə</b>	<b>'χarən-əs</b>	<b>χarə'n-i</b>
	խառն մը	խառնը	խառնս	խառնի
'mixed with roses'	<b>varth-a-'χarən-mə</b>	<b>varth-a-'χarn-ə</b>	<b>varth-a-'χarn-əs</b>	<b>varth-a-χar'n-i</b>
	վարդախառն մը	վարդախառնը	վարդախառնս	վարդախառնի

When a C-initial suffix like *-mə* is added, the internal schwa can't be deleted: \**kʰarn-mə* 'a lamb'. If a V-initial suffix like *-ə* or *-i* is added, the internal schwa is deleted in standard speech. But in colloquial speech, the schwa can be retained in some words. This schwa deletion is discussed in ([cite chapter](#)). We see the stress still on the rightmost full vowel: *'mex(ə)r-ə* 'the honey'.

The generalization thus is that if a word has both schwa and non-schwa vowels, stress is on the rightmost non-schwa vowel. The most typical situation is when the penultimate syllable is a non-schwa while the final is a schwa. Another attested situation is when the antepenult has a non-schwa, while the penult and final have schwas. To our knowledge, there aren't other logically possible cases such as the non-schwa being on the fourth-to-last syllable in the word. Clitics do present such cases though, discussed in §5.2.

### 5.1.3 Regular final stress for all-schwa words

The previous subsections concerned the assignment of regular stress in words that include at least one non-schwa vowel. It is relatively rare to find words where all the vowels are schwas. In this situation, there is reported variation on how stress works in these words. Some report final stress, while some report initial stress. HD's judgments though align more with final stress.

Schwa-only words can be categorized into two types: nativized loanwords and onomatopoeia.

For the loanword group (Table 5.10), there are some words that were borrowed from Ottoman Turkish or Lebanese Arabic. For the Turkish-based loanwords, many of these source Turkish words contain the Turkish vowel /u/ spelled <ı>. The vowel is rendered as a schwa in Armenian. Many of these words likewise end in a velar stop in Turkish, but a uvular fricative in Armenian.

Table 5.10: Stress in schwa-only words that are from Ottoman Turkish

		+ indefinite	+ definite	+ instrumental	Turkish
'pistachio'	fəs'təχ	fəs'təχ-mə	fəs'təχ-ə	fəstə'χ-ov	'fistik'
	ֆստղիս	ֆստղիս մը	ֆստղիս-ə	ֆստղիսի	
'mustache'	bəj'jəχ	bəj'jəχ-mə	bəj'jəχ-ə	bəjjə'χ-ov	'bıyık'
	պըյըիս	պըյըիս մը	պըյըիս-ə	պըյըիսի	
'ticklish'	ɛə'dəχ	ɛə'dəχ-mə	ɛə'dəχ-ə	ɛədə'χ-ov	'gıdık'
'hernia'	fə't'həχ	fə't'həχ-mə	fə't'həχ-ə	fət'hə'χ-ov	'fitik'

For these words, the root has only schwas and gets final stress: fəs'təχ 'pistachio'. When a non-schwa suffix is added, we see stress shift: fəstə'χ-ov (ins.). But if a schwa suffix is added, we don't see stress shift: fəs'təχ-ə (def.).

These words are largely banned from written standard Armenian, but are common in colloquial speech. We could find the Armenian spelling for some but not all of these words. These words must have entered the language rather early, at least before the 1915 genocide. More such loanwords are reported in Աճառյան (1902) study on Turkish borrowings in early modern Istanbul Armenian.

The other group of schwa-only words are onomatopoeic words. For these words, Adjarian reports final stress in what we could be his native ideolect of Western Armenian. In contrast, Vaux reports initial stress in what is likely the ideolect of his Eastern Armenian informants.

**cite adjarian, vaux data, (Vaux 1998: 133) (Աճառյան 1971a: 339)**

The above stress judgments are taken from Vaux and Adjarian. HD doesn't know any of these words. Thus they're all nonce words for HD. If forced, the

most natural pronunciation for HD is to apply final stress. But because these are unknown words for HD, we can't be sure how these words are pronounced by people who do know them.

We're not sure why Vaux and Adjarian provide conflicting judgments on stress. It is possible that the differences reflect speaker variation, whether by time or region. It is also possible that all perhaps schwa stress is acoustically very weak, thus these differences are due to difficulty in perceiving the exact location of stress.

#### 5.1.4 Morphophonological domain of stress

This section discusses how to define the domain of stress in terms of connecting between what types of morphology are involved in forming final stress.

The previous sections looked at regular primary stress in words that have diverse morphological structures. In terms of morphological structure, regular primary stress does not distinguish between roots, suffixed roots, and compounds (Table 5.11). These structures all get regular stress on the rightmost non-schwa. For schwa-only words though, stress stays in the root, ignoring schwa-headed suffixes.

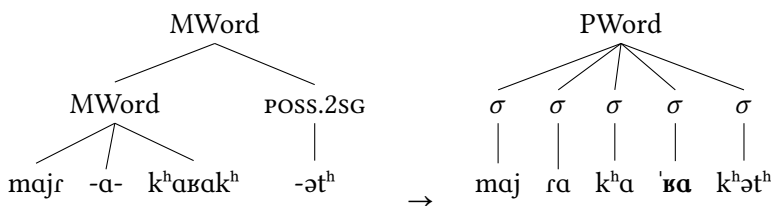
Table 5.11: Overview of regular primary stress in suffixed roots and compounds

Root	k <sup>h</sup> a'ʁak <sup>h</sup>	'city'	քաղաք
	k <sup>h</sup> aʁa'k <sup>h</sup> -ov	'city-INS'	քաղաքով
	k <sup>h</sup> a'ʁak <sup>h</sup> -ə	'city-DEF'	քաղաքը
Root	'k <sup>h</sup> aʁən	'lamb'	գառն
	k <sup>h</sup> aʁ(ə)'n-i	'lamb-GEN'	գառնի
	'k <sup>h</sup> aʁən-mə	'lamb-INDF'	գառն մը
Root	fəstəx	'pistachio'	ֆստըխ
	fəstəx-'ner	'pistachio-PL'	ֆստըխներ
	fəstəx-əs	'pistachio-POSS.1SG'	ֆստըխս
Compound	majr-a-k <sup>h</sup> a'ʁak <sup>h</sup>	'capital'	մայրաքաղաք
	mother-LV-city		
	majr-a-k <sup>h</sup> aʁa'k <sup>h</sup> -e	'capital-ABL'	մայրաքաղաքէ
	majr-a-k <sup>h</sup> a'ʁak <sup>h</sup> -ət <sup>h</sup>	'capital-POSS.2SG'	մայրաքաղաքդ

The basic generalization is that the entire morphological word (root, suffixes, compounds) is involved in creating the domain for final stress (the prosodic

word). A prosodic word or phonological word is defined as the string of elements (morphemes) that is syllabified together, and the rightmost non-schwa in this string gets regular final stress. This grammar is primarily descriptive so we generally don't provide theoretical trees for words and sentences. But in Representation 3, we provide a simple morphological and prosodic tree for the inflected compound 'capital-poss.2sg' or 'your capital' from Table 5.11.

**Representation 3.** Mapping a morphological word (MWord) to a prosodic word (PWord) with final stress for [majr-ɑ-kʰɑʁakʰ-ətʰ] 'your capital'.



make a compound pword

## 5.2 Stress when clitics are added

Armenian has many derivational and inflectional suffixes. These are included into the domain of stress (the prosodic word) and can get final stress. There are also words that clitics. These clitics are encliticized into the preceding word and don't get stress.

### 5.2.1 Words with one clitic

Cross-linguistically, a 'clitic' is a fuzzy concept (Anderson 2005). A clitic is a morpheme or word which acts 'contentful' enough for the morphology and syntax, but they are 'weak' for the phonology. For example the English verb 'is' is a morphological word because it has its own meanings and acts as a verb. In careful speech for a sentence like 'It is here', the word 'is' is phonologically heavy enough that it can carry its own stress and it's not syllabified with neighboring words. This means that the word 'is' acts as a phonological word. But in casual speech, the verb is often reduced to just 's' as in 'It's here'. This reduction means that that the word has been changed from a phonological word to just a clitic that is syllabified with the preceding word.

For Armenian, there are many particles and function words. A list of such particles is in (cite chapter). We discuss their clitic status more in §6.1. Some of



them are phonologically clitics (underlined; Table 5.12). These are the copula, the word for ‘also’, the conjunction ‘and’ =*al*, the colloquial question particle =*mə*, the progressive marker =*gor*, the subjunctive marker =*ne*. The progressive and subjunctive markers can attach to only verbs.<sup>3</sup>

Table 5.12: List of phonological clitics

	Stress	Syllabified	
Copula	u'raχ = <u>e-n</u>	u.'ra.χ <u>en</u>	
	happy <u>is-3PL</u>	‘They are happy.’	Ուրախ են:
‘also’ = <i>al</i>	ba'nir = <u>al</u>	ba.'ni.ra <u>l</u>	
	cheese = <u>also</u>	‘Also cheese.’	Պանիր ալ:
‘and’ = <i>u</i>	'ha <u>ts</u> = <u>u</u> banir	'ha.'tsu banir	
	bread = <u>and</u> bread	‘Bread and cheese.’	Հաց ու պանիր:
Q. = <i>mə</i>	u'd-e-m = <u>mə</u>	u.'dem.mə	
	eat-TH-1SG <u>Q</u>	‘Do I eat it?’	Ուտե՞մ մը:
Prog. = <i>gor</i>	g-u'd-e-m = <u>gor</u>	gu.'dem.gor	
	IND-eat-TH-1SG <u>PROG</u>	‘I am eating.’	Կ'ուտեմ կոր
Subj. = <i>ne</i>	u'd-e-m = <u>ne</u>	u.'dem.ne	
	eat-TH-1SG <u>SBJV</u>	‘If I eat it.’	Ուտեմ նէ:

The semantics and uses of these particles is discussed more in depth elsewhere in (cite chapter). This section focuses just on their stress properties. Of the above particles, the copula is the only one that can take on different forms for different inflectional features, like present 2PL =*e-k<sup>h</sup>* or past 2SG =*e-ji-r*. The paradigm is discussed in (cite chapter).

These clitics are nearly all monosyllabic. The only exception is the copula. This copula is monosyllabic in the present, but it has bisyllabic forms in the past. Note that the past suffix *-i* creates some type of prominence on the preceding clitic syllable =*e*, but we’re not sure if this is just an intonational illusion because of how this form is bisyllabic (1).

- (1) u'raχ =e-ji-n  
happy =is-PST-3PL  
‘They were happy’  
Ուրախ էին:

<sup>3</sup>Note that the progressive marker is prescriptively banned from written formal registers, and registered to just informal spoken speech. This is discussed in (cite chapter).

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Of the clitics in Table 5.12, almost all of them are obligatorily syllabified with the preceding word. The exception is the word ‘and’ (2) which can syllabify either with or without the preceding word. The lack of syllabification correlates with having some type of pause before this word. Furthermore, the syllabified version often gives the sense that the two coordinated items are one entity (such as a dish), while the lack of syllabification gives a sense that the items are more separate. But this is not a strict rule because the syllabified form can give the meaning of separate senses.

- (2) V1: hats =u banir g-uz-e-m [‘ha.tsu]   
 V2: hats u banir g-uz-e-m [‘hats u]   
 bread and cheese IND-want-TH-1SG   
 V1: ‘I want a (meal of) bread and cheese.’   
 V1/V2: ‘I want bread, and (I want) cheese.’

When these clitics are added to a word with final stress, these clitics don’t cause any stress shift.<sup>4</sup> This was seen in Table 5.12. In those words, stress is on the rightmost full vowel of the word. If the word is a schwa-only word (3), stress is on the rightmost schwa of the root. The clitic is ignored. Note that there are no verbs with final schwas, so we can’t attach the progressive or subjunctive marker to them.

- (3) a. ham-ə fəs’təχ =e [fəs.’tə.χe]   
 taste-DEF pistachio =is   
 ‘The taste (of this food) is pistachio.’   
 Համը ֆստիոն է:   
 b. mart<sup>h</sup>-ə fə’t<sup>h</sup>əχ =al un-i [fə.’t<sup>h</sup>ə.χal]   
 man-DEF hernia =also have-TH   
 ‘The man also has a hernia.’   
 Մարդը ? ալ ունի:   
 c. mart<sup>h</sup>-ə bəj’jəχ =u moruk<sup>h</sup> un-i [bəj.’jə.χu]   
 man-DEF mustache =and beard have-TH   
 ‘The man has a mustache and beard.’   
 Մարդը պղլիս ու մորուք ունի:

<sup>4</sup>This generalization is for Western Armenian as spoken by HD and other members of the Lebanese community. In our fieldwork, we’ve found though that in Eastern Armenian, the ‘also’ clitic [el] can take stress. Clitic behavior in Eastern Armenian is an open question.

If a word has penultimate stress because of schwa (4), whether epenthetic root schwa or suffix schwa, then we still don't find any stress shift. Stress stays on the rightmost non-schwa (ignoring the clitic). For schwa-only words, stress stays on the root schwa. Note that epenthetic schwas tend to delete before these V-initial clitics in standard speech, but they can surface in colloquial speech.

- (4) a. asiga 'mɛʁ =e ['mɛ.ʁə.re]  
 asiga 'mɛʁ =e ['mɛʁ.re]  
 this honey =is  
 'This is honey.'  
 Ասիկա մեղր է:
- b. asiga fəs'təχ-əs =e [fəs'tə.χ<sup>h</sup>ə.se]  
 this pistachio-POSS.1SG =is  
 'This is my pistachio.'  
 Ասիկա ֆստըխս է:

The same judgments are found for other clitics (5), regardless if the word has an epenthetic schwa or is a schwa-only word.

- (5) a. i. 'mɛʁ =al g-uz-e-m ['mɛ.ʁə.ral]  
 'mɛʁ =al g-uz-e-m ['mɛʁ.ral]  
 honey =also IND-want-TH-1SG  
 'I also want honey.'  
 Մեղր ալ կ'ուզեմ:
- ii. 'mɛʁ =u ʃak<sup>h</sup>ar g-uz-e-m ['mɛ.ʁə.ru]  
 'mɛʁ =u ʃak<sup>h</sup>ar g-uz-e-m ['mɛʁ.ru]  
 honey =and sugar IND-want-TH-1SG  
 'I want honey and sugar.'  
 Մեղր ու շաքար կ'ուզեմ:
- b. i. fəs'təχ-əs =al g-uz-e-m [fəs'tə.χ<sup>h</sup>ə.səl]  
 pistachio-POSS.1SG =also IND-want-TH-1SG  
 'I also want my pistachio.'  
 Ֆստըխս ալ կ'ուզեմ:
- ii. fə't<sup>h</sup>əχ-əs =u t<sup>h</sup>ak<sup>h</sup>ut<sup>h</sup>jɪn-əs [fə't<sup>h</sup>ə.χ<sup>h</sup>ə.su]  
 hernia-POSS.1SG =and fever-POSS.1SG  
 'My hernia and fever.'  
 Ֆստըխս ու տաքութիւն:

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- iii. fəs'təχ-əs                      =mə g-uz-e-s                      [fəs.'tə.χ<sup>h</sup>əs.mə]  
 pistachio-POSS.1SG =Q    IND-want-TH-1SG  
 'Do you want my pistachio (as opposed to something else)?'  
 Ֆաստը՝խս մը կ'ուզես:

If the word has antepenultimate stress (6), then again cliticization does nothing. We end up seeing stress on the fourth-to-last syllable of the word+clitic sequence. This is the case for words with epenthetic schwas as in below.

- (6) a. asiga 'mexər-əs                      =e ['me.χə.ɾə.se]  
 this    honey-POSS.1SG =is  
 'This is my honey.'  
 Ասիկա մեղրս է:  
 b. 'mexər-əs                      =al    g-uz-e-s                      ['me.χə.ɾə.sal]  
 honey-POSS.1SG =also IND-want-TH-2SG  
 'You also want my honey.'  
 Մեղրս ալ կ'ուզես:  
 c. 'mexər-əs                      =u    ʃak<sup>h</sup>ar-əs                      ['me.χə.ɾə.su]  
 honey-POSS.1SG =and sugar-POSS.1SG  
 'My honey and (my) sugar.'  
 Մեղրս ու շաքարս:  
 d. 'mexər-əs                      =mə g-uz-e-s                      ['me.χə.ɾəs.mə]  
 honey-POSS.1SG =Q    IND-want-TH-2SG  
 'Do you want my honey (as opposed to something else)?'  
 Մե՞ղրս մը կ'ուզես:

Note that the stress locations are based on HD's perception of prominence. However, in our spectrogram recordings, it seems that the pitch rises often continue onto from the stressed syllable all the way to the clitic. It's unknown how the acoustics of stress are affected by cliticization.

The generalization so far is that if a word has regular primary stress on some syllable, adding a single clitic doesn't cause any changes in the location of stress. Complications arise when either the word has irregular stress. We discuss these complications later in §5.3 and §5.4.4.3. We next turn to clitic clusters.

### 5.2.2 Words with multiple clitics or clitic clusters

The generalization that clitics are unstressed also applies in clitic clusters. The clitics can come in different combinations. if the verb has regular primary stress

on some syllable, clitic clusters generally don't trigger stress shift or take stress. Exceptions arise in clitic clusters with the subjunctive *-ne*.

As a caveat, the data here is based on just our impressions of stress as native speakers. However, based on inspecting our spectrograms, we suspect that these clitic clusters cause changes in the pitch contours of the stressed and post-stressed syllables. This pitch changes don't affect the perception of stress, but they do seem to erase the acoustic properties of the syllable that we think has stress.

We first go over clusters that don't trigger stress (§5.2.2.1), then clusters that do trigger stress (§5.2.2.2). Three-clitic clusters are rather rare but possible (§5.2.2.3), and their pattern like two-clitic clusters. We summarize in §5.2.2.4.

### 5.2.2.1 Clitic clusters that don't trigger stress shift

For a word with regular stress, it is possible to add the following types of two-clitic clusters without any stress shift:

1. copula + 'also'
2. copula + Q
3. 'also' + copula
4. 'also' + Q
5. progressive + 'also'
6. progressive + Q
7. subjunctive + 'also'

Some orders are more typical than others. Some orders are also more pragmatically special than others. But regardless, stress does not shift for these clusters, regardless if the base word has final, penultimate, or antepenultimate stress. Glide epenthesis applies between the clitics to repair vowel hiatus.

For the copula + 'also' sequence, the second word =*al* does not give the meaning of 'again' (7). It instead creates a sense of exasperation like 'I have already done X.' We have found it difficult to naturally elicit this cluster except after verbs. Verbs don't have final schwas so we can't see how this cluster behaves with preceding schwas.

- (7) No stress shift in copula + 'also' clitic clusters

a. im      hed-əs      χo's-adz      =e =al      [χo.'sa.dze.jal]  
      my.GEN with-POSS.1SG speak-RPTCP =is =also  
      'Has spoken to me already.'  
      ከህ ከጥህ ከሀሳዕ ኒ ዛ፤

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For the copula + Q cluster, again we find no stress shift (8). But because the Q particle is semantically loaded, we do find special intonation contours, discussed in Section §6.5.2.6.

### (8) No stress shift in copula + Q clitic clusters

- a. u'raχ =e-s =mə [u.'ra.χes.mə]  
happy =is-2SG =Q  
'Are you happy?'  
Ուրախ ես մը:
- b. asiga fəs'təχ =e =mə [fəs.'tə.χe.mə]  
this pistachio =is =Q  
'Is this pistachio?'  
Ասիկա ֆստիօն է մը:
- c. asiga se'ʁan-əs =e =mə [se.'ʁa.nə.se.mə]  
this table-POSS.1SG =is =Q  
'Is this my table?'  
Ասիկա սեղանս է մը:
- d. asiga fəs'təχ-əs =e =mə [fəs.'tə.χə.se.mə]  
this pistachio-POSS.1SG =is =Q  
'Is this my pistachio?'  
Ասիկա ֆստիօնս է մը:
- e. asiga 'mexər =e =mə ['me.ʁə.re.mə]  
this honey =is =Q  
'Is this honey?'  
Ասիկա մեղր է մը:
- f. asiga 'va<sup>h</sup>ər-mən =e =mə ['va.k<sup>h</sup>ər.mə.ne.mə]  
this tiger-INDF =is =Q  
'Is this a tiger?'  
Ասիկա վաճղկ մըն է մը:

The cluster of 'also' + copula can also be formed (9). The meaning of this cluster is more straightforward compared to the meaning of copula + 'also'. Stress is stable as expected.

### (9) No stress shift in 'also' + copula clitic clusters

- a. u'raχ =aɫ =e [u.'ra.χa.ɫə]  
happy =also =is  
'He is also happy.'

Ուրախ ւալ է:

- b. asiga fəs'təχ =al =e [fəs.'tə.χa.le]

this pistachio =also =is

'This is also pistachio.'

Ասիկա ֆստըիս ւալ է:

- c. asiga im se'ʁan-əs =al =e [se.'ʁa.nə.sa.le]

this my.GEN table-POSS.1SG =also =is

'This is also my table.'

Ասիկա իմ սեղանս ւալ է:

- d. asiga im fəs'təχ-əs =al =e [fəs.'tə.χə.sa.le]

this my.GEN pistachio-POSS.1SG =also =is

'This is also my pistachio.'

Ասիկա իմ ֆստըիս ւալ է:

- e. asiga 'mexər =al =e ['me.χə.ra.le]

this honey =also =is

'This is also honey.'

Ասիկա մեղր ւալ է:

- f. asiga 'vak<sup>h</sup>ər-mən =al =e ['va.k<sup>h</sup>ər.mə.na.le]

this tiger-INDF =also =is

'This is also a tiger.'

Ասիկա վագր մըն ւալ է:

The cluster of 'also' + Q can also be formed (10). The question particle creates an interrogative where the preceding word is questioned. Stress is stable as expected.

(10) No stress shift in 'also' + Q clitic clusters

- a. ba'nir =al =mə g-uz-e-s [ba'ni.ral.mə]

cheese =also =Q IND-want-TH-2SG

'Do you want also cheese?'

Պանիր ւալ մը կ'ուզես:

- b. fəs'təχ =al =mə g-uz-e-s [fəs.'tə.χal.mə]

pistachio =also =Q IND-want-TH-2SG

'Do you want also pistachio?'

Ֆստըիս ւալ մը կ'ուզես:

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- c. im      se'ʁan-əs      =al    =mə g-uz-e-s      [se.'ʁa.nə.sal.mə]  
 my.GEN table-POSS.1SG =also =Q    IND-want-TH-2SG  
 'Do you want also my table?'  
 Իմ սեղանն ալ մը կ'ուզես:
- d. im      fəs'təχ-əs      =al    =mə g-uz-e-s  
 my.GEN pistachio-POSS.1SG =also =Q    IND-want-TH-2SG  
 [fəs.'tə.χə.sal.mə]  
 'Do you want also my pistachio?'  
 Իմ ֆստիլին ալ մը կ'ուզես:
- e. 'meʁər =al    =mə g-uz-e-s      ['me.ʁə.ral.mə]  
 honey =also =Q    IND-want-TH-2SG  
 'Do you want also honey?'  
 Մե՞ր ալ մը կ'ուզես:
- f. 'vəkʰər-mən =al    =mə g-uz-e-s      ['və.kʰər.mə.nal.mə]  
 tiger-INDF =also =Q    IND-want-TH-2SG  
 'Do you want also a tiger?'  
 Վա՞րը մը ալ կ'ուզես:

We also consider three other clusters: progressive + 'also' (11a), progressive + Q (11b), subjunctive + 'also' (11c). These clusters are attached only to verbs. Verbs don't have any schwa suffixes, so we cannot see how this cluster would behave after schwas.

- (11) No stress shift in progressive + 'also', progressive + Q, and subjunctive + 'also' clitic clusters
- a. g-u'd-e-m      =gor    =al    [gu.'dem.go.ral]  
 IND-eat-TH-1SG =PROG =also  
 'I am eating already! (Stop telling me to eat)'  
 Կ'ուտեմ կոր ալ:
- b. g-u'd-e-s      =gor    =mə [gu.'des.gor.mə]  
 IND-eat-TH-2SG =PROG =Q  
 'Are you eating?'  
 Կ'ուտե՞ս կոր մը:
- c. jev    jetʰe u'd-e-s      =ne    =al    [u.'des.ne.jal]  
 and if    eat-TH-2SG =SBJV =Q  
 'And if you eat.'



Եւ եթէ ուսես նէ ալ:

The meaning of the ‘also’ clitic can vary between being just a simple ‘I am doing X again’, to an exasperated ‘I am doing X already!’. Context determines which meaning is more dominant. We use the ‘already!’ meaning because that meaning is more automatic without context.

Thus, the above clitic clusters do not cause any changes in stress when they are attached to a word with regular primary stress. The next section discusses clusters which do cause shifts.

### 5.2.2.2 Clitic clusters that trigger stress shift

Among the possible clusters, the subjunctive clitic *=ne* is special because it can trigger stress shift when part of a cluster. This clitic can only attach to verbs, so we cannot see the effect of this clitic on schwas.

In the copula + the subjunctive cluster (12), the copula acts as an auxiliary verb when attached to a verbal participle. The subjunctive can either trigger stress shift or not. Stress shift is more typical. The lack of stress shift gives a connotation that the verb is focused, or that the subjunctive clitic was an afterthought.

#### (12) Stress shift in copula + subjunctive clitic clusters

- a. de's-ad̥z =e-s [de.'sa.d̥zes]  
 see-RPTCP =is-2sg  
 ‘You have seen.’  
 Տեսած ես:
- b. jet<sup>h</sup>e de's-ad̥z =e-s =ne [de.'sa.d̥zes.ne]  
 jet<sup>h</sup>e des-a'd̥z =e-s =ne [de.sa.'d̥zes.ne]  
 if see-RPTCP =is-2sg =SBJV  
 ‘If you have seen it.’  
 Եթէ տեսած ես նէ:

In the progressive + subjunctive cluster (13), stress shift is possible. Stress shift is typical and feels more typical than not shifting stress (Khanjian 2013: 84).

#### (13) Stress shift in progressive + subjunctive clitic clusters

- a. g-u'd-e-s =gor [gu.'des.gor]  
 eat-TH-2SG =PROG  
 ‘You are eating.’  
 Կ'ուսես կոր:

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- b. jet<sup>h</sup>e g-u'd-e-s =gor =ne [gu.'des.gor.ne]  
 jet<sup>h</sup>e g-ud-e-s ='gor =ne [gu.des.'gor.ne]  
 if eat-TH-2SG =PROG =SBJV  
 'If you are eating.'  
 Եթէ կ'ուտես կոր նէ:

The clitic =*ne* is special in that it can regular induce stress shift. We suspect this is because this clitic is deeply involved with special intonational contours for subjunctive clauses, discussed in Section §6.6.1.

We also suspect that the original stressed vowel does have some level of prominence in these cliticized forms. So for example in *g-ud-e-s=gor=ne* 'If you are eating' (13b), the most prominent syllable is *gor*. But there is some perceived prominence on the originally stressed syllable *des*. It is possible that our perception indicates secondary stress: [gu.,des.'gor.ne]. Acoustic data is needed to verify this because there is relatively little phonetic data on secondary stress.

### 5.2.2.3 Clitic clusters with three members

It is possible to create clitic clusters with three members. These clusters either have 1) the question particle as the last member, or 2) have the subjunctive clitic. These clusters are the following:

- copula + 'also' + Q
- 'also' + copula + Q
- progressive + 'also' + Q
- copula + subjunctive + 'also'
- progressive + subjunctive + 'also'

These clusters do create a type of prominence on the penultimate clitic. We're not sure if this prominence should be classified as stress, or as special intonation contours.

For the copula + 'also' + Q cluster (14), stress stays on the original syllable. However, the Q particle does induce some type of prominence on the preceding clitic 'also'. We think this prominence is due to the intonational contours caused by mixing the meanings of 'already' from the first clitic, and the meaning of questioning.

- (14) χo's-adz =e =al =mə [χo.'sa.dze.jal.mə]  
 speak-RPTCP =is =also =Q  
 'Has he spoken already?'  
 Խօսած է ալ մը:

The cluster ‘also’ + copula + Q (15) can be attached to words with final stress, penultimate stress, and antepenultimate stress. We perceive stress on the original syllable. But there is a very strong prominence and lengthening on the copula. Again, it is unknown if this is true stress or just intonation.

(15) Formation of ‘also’ + copula + Q clitic clusters

- a. u'raχ =al =e =mə [u.'ra.χa.lə.mə]  
 happy =also =is =Q  
 ‘Is he also happy?’  
 Ուրախ ալ է մը:
- b. asiga fəs'təχ =al =e =mə [fəs.'tə.χa.le.mə]  
 this pistachio =also =is =Q  
 ‘Is this also pistachio?’  
 Ասիկա ֆստիօն ալ է մը:
- c. asiga im se'ʁan-əs =al =e =mə [se.'ʁa.nə.sa.le.mə]  
 this my.GEN table-POSS.1SG =also =is =Q  
 ‘Is this also my table?’  
 Ասիկա իմ սեղանս ալ է մը:
- d. asiga im fəs'təχ-əs =al =e =mə [fəs.'tə.χə.sa.le.mə]  
 this my.GEN pistachio-POSS.1SG =also =is =Q  
 ‘Is this also my pistachio?’  
 Ասիկա իմ ֆստիօնս ալ է մը:
- e. asiga 'mexər =al =e =mə ['me.ʁə.ra.le.mə]  
 this honey =also =is =mə  
 ‘Is this also honey?’  
 Ասիկա մեղր ալ է մը:
- f. asiga 'va.kʰər-mən =al =e =mə ['va.kʰər.mə.na.le.mə]  
 this tiger-INDF =also =is =Q  
 ‘Is this also a tiger?’  
 Ասիկա վաճղ մըն ալ է:

Similar ambiguities arise for the other clusters: copula + subjunctive + ‘also’, and progressive + subjunctive + ‘also’. For the first (16), the substring of copula + subjunctive triggers variable stress shift to the copula. Adding the ‘also’ particle removes this variability, and we find stress on the copula.

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- (16) jet<sup>h</sup>e des-ɑ'dž =e-s =ne =ɑl [de.sa.'džes.ne.jal]  
 if see-RPTCP =is-2sg =SBJV =also  
 'If you have already seen it.'  
 Եթէ տեսած ես նէ ալ:

Similarly for progressive + subjunctive cluster (17), the subjunctive triggers stress shift to the progressive. Adding the 'also' particle doesn't change anything.

- (17) jet<sup>h</sup>e g-ud-e-s ='gor =ne =ɑl [gu.des.'gor.ne.jal]  
 if eat-TH-2SG =PROG =SBJV =also  
 'If you are eating already.'  
 Եթէ կ'ուտես կոր նէ ալ:

### 5.2.2.4 Summary of attested clitic clusters

We have surveyed different types of clitic clusters. This is summarized in Table 5.13. We examined how these clusters affect the stress of a word that has regular primary stress. For two-clitic clusters, most of them don't trigger stress shift. Some clusters do trigger stress shift, and these clusters involve the subjunctive. We use asterisk \* to mark these clusters that trigger stress shift.

Table 5.13: Possible two-clitic clusters and their effects on stress for words with regular stress

1 <sup>st</sup> , 2 <sup>nd</sup>	copula =e	'also' =al	'and' =u	Q =mə	prog. =gor	sbjv. =ne
copula =e	NR	(7)		(8)		(12)*
'also' =al	(9)	NR		(10)		
'and' -u			NR			
Q =mə				NR		
prog. =gor		(11a)		(11b)	NR	(13)*
sbjv. =ne		(11c)				NR

Among the unattested clitic clusters, we cannot have clusters where the same clitic appears twice (NR = no repetition). Some clitics can't combine because of morphosemantics or paradigm reasons. For example, verbs take the progressive marker, but this marker can't be used alongside a copula auxiliary. Some clusters are unattested because of pragmatics: it is difficult to make sense of a clause that is both subjunctive and a question.

One consistent gap is clusters with the clitic ‘and’ [u] (18). This morpheme can be used after clitics. But in these situations, the morpheme does not syllabify with the preceding word, but is instead syllabified alone. In this case, the word acts more as a separate phonological word instead of a clitic.

- (18) mart<sup>h</sup>-ə u'raχ =e u dəχur =e [u.'ra.χe u]  
 man-DEF happy =is and sad =is  
 ‘The man is happy and sad.’  
 Մարդը ուրախ է ու տխուր է:

From the attested two-clitic clusters, we can add additional clitics: either Q or ‘also’ (cite chapter section). Adding the ‘also’ particle doesn’t cause any significant stress changes. Adding the question particle does induce special prominence on the second clitic. But we don’t know if this prominence should be classified as lexical stress or as just intonational prominence.

### 5.3 Prestressing derivational suffixes

Most derivational suffixes are phonologically regular in that they take regular primary stress when they are word-final. However there is a small set of derivational suffixes that irregularly avoid stress when they’re word-final (Table 5.14). These suffixes are the ordinal suffixes -erort<sup>h</sup>, -rort<sup>h</sup>/, the adverbializer suffixes /-oren, -ap<sup>h</sup>ar, -abes/, and the hypocoristic suffix /-o/.

Table 5.14: Prestressing derivational suffixes which avoid stress when word-final

	Uninflected	+ Genitive	+ Definite	+ Clitic ‘also’ or ‘is’	
Ordinal	hiŋk <sup>h</sup> -erort <sup>h</sup> jeg-rort <sup>h</sup>	hiŋk <sup>h</sup> -erort <sup>h</sup> -i jeg-rort <sup>h</sup> -i	hiŋk <sup>h</sup> -e'rort <sup>h</sup> -ə jeg-'rort <sup>h</sup> -ə	hiŋk <sup>h</sup> -e'rort <sup>h</sup> =e jeg-'rort <sup>h</sup> =e	‘fifth’ հինգերորդ ‘second’ երկրորդ
Adverbializer	u'raχ-oren u'raχ-ap <sup>h</sup> ar p <sup>h</sup> ar'tsər-abes			u'raχ-o'ren=al u'raχ-a'p <sup>h</sup> ar=al p'ar'tsər-a'bes=al	‘happily’ ուրախօրէն ‘happily’ ուրախաբար ‘highly’ բարձրապէս
Hypocoristic	'mar-o	mar-o-'ji	ma'r-o-n	ma'r-o=je	‘Maro’ Մարօ

These suffixes place stress on the preceding vowel. Most of the time, the stressed preceding vowel is a non-schwa like u'raχ-oren, but this vowel can be a schwa p<sup>h</sup>ar'tsər-abes.

These irregular suffixes lose their irregularity when another suffix or clitic is added. Thus if we added a full vowel suffix like -i, then we get final stress. Similarly, if we added a schwa suffix -ə, a non-vocalic suffix -n, or a clitic =al, then we see stress shift to the irregular suffix.

The 3 types of derivational suffixes show identical behavior in irregular stress. The following sections list examples of their use. Note that there is significant variation in the irregularity of these suffixes as reported in previous teaching grammars. For the Lebanese community however, their irregularity seems more consistent.

### 5.3.1 Ordinal suffix

A number can be either a cardinal number like ‘five’ or an ordinal number like ‘fifth’. In Armenian, ordinals are formed by adding the suffix *-erort<sup>h</sup>* or *-rort<sup>h</sup>*. The relevant morphology is explained in [cite chapter on ordinal morpho](#). This section focuses on the stress patterns of ordinals.

In isolation form, ordinals have stress before the suffix, not on the suffix. Table 5.15 lists common ordinal numbers. Usually the pre-suffix syllable is also the first syllable of the word. But higher numbers have more syllables. The default ordinal suffix is *-erort<sup>h</sup>*, but numbers 2-4 take the *-rort<sup>h</sup>* allomorph.

Table 5.15: Stress before the ordinal suffix for ordinals in isolation

2nd	'jerg-rort <sup>h</sup>	երկրորդ	11th	dasnə'meg-erort <sup>h</sup>	տասնըմէկերորդ
2nd	'jeg-rort <sup>h</sup>	երկրորդ	20th	k <sup>h</sup> ə'san-erort <sup>h</sup>	քսաներորդ
3rd	'jer-rort <sup>h</sup>	երրորդ	30th	jere'sun-erort <sup>h</sup>	երեսուներորդ
3rd	'je-rort <sup>h</sup>	երրորդ	40th	k <sup>h</sup> arə'sun-erort <sup>h</sup>	քառասուներորդ
4th	'tʃor-rort <sup>h</sup>	չորրորդ	50th	hi'sun-erort <sup>h</sup>	յիսուներորդ
4th	'tʃo-rort <sup>h</sup>	չորրորդ	60th	vat'sun-erort <sup>h</sup>	վաթսուներորդ
5th	'hing-erort <sup>h</sup>	հինգերորդ	70th	jot <sup>h</sup> and'sun-erort <sup>h</sup>	եօթանասուներորդ
6th	'vets-erort <sup>h</sup>	վեցերորդ	80th	utsun-erort <sup>h</sup>	ութսուներորդ
7th	'jot <sup>h</sup> -erort <sup>h</sup>	եօթերորդ	90th	inisun-erort <sup>h</sup>	ինիսուներորդ
8th	'ut <sup>h</sup> -erort <sup>h</sup>	ութերորդ	100th	harər-erort <sup>h</sup>	հարիւրերորդ
9th	'in-erort <sup>h</sup>	իներորդ	1000th	hazar-erort <sup>h</sup>	հազարերորդ
10th	'das-erort <sup>h</sup>	տասներորդ			

These ordinal suffixes place stress on the preceding syllable. This irregularity is lost if an inflectional suffix is added. For example, if we add a suffix with a non-schwa like *-i*, then stress shifts to the inflectional suffix. If we add a suffix with schwa or a clitic (Table 5.16), then stress shifts to the rightmost non-schwa in the word, which will be the ordinal suffix itself.

Table 5.16: Loss of irregular stress in suffixed ordinals

Isolation	2nd երկրորդ 'jeg-rort <sup>h</sup>	6th վեցերորդ 'vets-erort <sup>h</sup>	1000th հազարերորդ ha'zar-erort <sup>h</sup>
Genitive -i -ի	jeg-rort <sup>h</sup> -i	vets-erort <sup>h</sup> -i	hazar-erort <sup>h</sup> -i
Ablative -e -է	jeg-rort <sup>h</sup> -e	vets-erort <sup>h</sup> -e	hazar-erort <sup>h</sup> -e
Instrumental -ov -ով	jeg-rort <sup>h</sup> -ov	vets-erort <sup>h</sup> -ov	hazar-erort <sup>h</sup> -ov
Plural -ner -ներ	jeg-rort <sup>h</sup> -ner	vets-erort <sup>h</sup> -ner	hazar-erort <sup>h</sup> -ner
Definite -ə -ը	jeg-'rort <sup>h</sup> -ə	vets-e'rort <sup>h</sup> -ə	hazar-e'rort <sup>h</sup> -ə
1st possessive -əs -ս	jeg-'rort <sup>h</sup> -əs	vets-e'rort <sup>h</sup> -əs	hazar-e'rort <sup>h</sup> -əs
2nd possessive -ət <sup>h</sup> -դ	jeg-'rort <sup>h</sup> -ət <sup>h</sup>	vets-e'rort <sup>h</sup> -ət <sup>h</sup>	hazar-e'rort <sup>h</sup> -ət <sup>h</sup>
Indefinite -mə վը	jeg-'rort <sup>h</sup> -mə	vets-e'rort <sup>h</sup> -mə	hazar-e'rort <sup>h</sup> -mə
Clitic '=is' է	jeg-'rort <sup>h</sup> =e	vets-e'rort <sup>h</sup> =e	hazar-e'rort <sup>h</sup> =e
Clitic '=also' ալ	jeg-'rort <sup>h</sup> =al	vets-e'rort <sup>h</sup> =al	hazar-e'rort <sup>h</sup> =al
Derived -agan -ական	jeg-rort <sup>h</sup> -a'gan	vets-erort <sup>h</sup> -a'gan	hazar-erort <sup>h</sup> -a'gan

Some ordinals can also take a derivational suffix like *-agan* to form adjectives. Regular stress is found. The adjective is used to denote meanings like 'secondary', 'tertiary', and higher numbers.

The sentences below illustrate how these ordinals can be used in natural speech (19). The unsuffixed form can be said in isolation, or as a modifier in a noun phrase.

- (19) asiga im      ha'zar-erort<sup>h</sup>      k<sup>h</sup>irk<sup>h</sup>-əs      e  
       this    my.GEN thousand-ORDINAL book-POSS.1SG is  
       'This is my 1000th book.'  
       Ասիկա իմ հազարերորդ գիրքս է:

Ordinals can be inflected or cliticized when they're used without a noun (20).

- (20) a. hazar-erort<sup>h</sup>-e-n                      zəz-v-e-ts-a-n  
       thousand-ORDINAL-ABLDEF sick.of-PASS-TH-AOR-PST-3PL  
       'They got sick of the 1000th one.'  
       Հազարերորդէն զգուեցան:  
       b. asiga im      hazar-e'rort<sup>h</sup>-əs                      e  
       this    my.GEN thousand-ORDINAL-POSS.1SG is  
       'This is my 1000th (item).'  
       Ասիկա իմ հազարերորդ է:

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- c. hazar-e'**ro**r<sup>h</sup>-n=al                      g-uz-e-m  
 thousand-ORDINAL-DEF=also IND-want-TH-1SG  
 'I also want the 1000th one.'  
 Հազարերորդն ալ կ'ուզեմ:

Note that the clitic 'also' is rather unnatural to add to the ordinal directly; it is more natural to add the definite suffix between the ordinal and clitic.

For the cliticized forms (21), a common scenario is when the ordinal designates the school grade of a student.

- (21) a. aχtʃig-ə<sup>h</sup>      vor    meg t<sup>h</sup>asaran-n=e  
 girl-POSS.2SG what one class-DEF=is  
 'Which grade is your daughter in?' (Lit. What class is your girl?)  
 Աղջիկդ ո՞ր մէկ դասարանն է:  
 b. aχtʃig-əs      jot<sup>h</sup>-e'**ro**r<sup>h</sup>=e  
 girl-POSS.1SG seven-ORDINAL=is  
 'My daughter is in the seventh grade.' (Lit. My girl is seventh.)  
 Աղջիկս եօթերորդ է:

The ordinal suffix *-erort<sup>h</sup>* can likewise be interrogative pronouns (wh-words) to mean something like 'which one?' or 'which grade' (Table 5.17). Here, the suffix is prestressing if uninflected. The orthography conventionally places the question symbol" on the stressed vowel of the root. When this word is inflected, HD's judgment is that there is no stress shift. There might be secondary stress on the rightmost non-schwa. For these wh-words, we suspect that there's high variability in the application of stress shift because of interaction between the lexical pre-stressing nature of the ordinal suffix *and* the prominence given to the interrogative root as an inherently focused element.



Table 5.17: Interrogative pronouns with the ordinal suffix

‘how many’	k <sup>h</sup> a’ni	քանի՞	‘how many?’
+ Ord	k <sup>h</sup> a’ni-je <sup>h</sup> ort <sup>h</sup>	քանի՞երորդ	‘which one (from some numbered set)?’
+ Ord + Ins	k <sup>h</sup> a’ni-je <sup>h</sup> or,t <sup>h</sup> -ov	քանի՞երորդով	‘from which one’
+ Ord + Def	k <sup>h</sup> a’ni-je <sup>h</sup> or,t <sup>h</sup> -ə	քանի՞երորդը	‘which one (definite)’
‘which’	‘vor	ո՞ր	‘which?’
+ Ord	vor-erort <sup>h</sup>	ո՞րերորդ	‘which one (from some numbered set)?’
+ Ord + Ins	‘vor-eror,t <sup>h</sup> -ov	ո՞րերորդով	‘from which one’
+ Ord + Def	‘vor-er,t <sup>h</sup> -ə	ո՞րերորդը	‘which one (definite)’
‘what’	‘intʃ	ի՞նչ	‘what?’
+ Ord	‘intʃ-erort <sup>h</sup>	ի՞նչերորդ	‘what (from some numbered set)?’
+ Ord + Ins	‘intʃ-eror,t <sup>h</sup> -ov	ի՞նչերորդով	‘from what’
+ Ord + Def	‘intʃ-er,t <sup>h</sup> -ə	ի՞նչերորդը	‘what (definite)’

The use of these interrogative ordinals is common when asking for the school grade of a person (22). In such contexts, the ordinal often takes a clitic.

- (22) t<sup>h</sup>əbrots-i-n metʃ marjam-ə ‘intʃ-e,t<sup>h</sup>-e  
 school-GEN-DEF in Mariam-DEF what-ORDINAL=IS  
 ‘What grade is Mariam in at school?’  
 Դպրոցին մէջ, Մարիամը ի՞նչերորդ է:

The above stress data is from HD’s judgments, as a person from the Beirut community. Previous grammars and documents report variation in whether -*ort<sup>h</sup>* suffix, -*erort<sup>h</sup>* suffix, or both suffixes place stress on the preceding syllable. We summarize the reported variation in **summarize all the sources on ordinal stress**

We don’t know why there is such reported variation. It could indicate that different communities have changed the rules for stressing these ordinals across time.

### 5.3.2 Adverbializer suffix

There are three derivational suffixes that turn words into adverbs: -*oren*, -*ap<sup>h</sup>ar*, -*abes*. Of the three suffixes, we feel that the -*oren* is the most productive, but all three suffixes are attested. For the Lebanese community, these suffixes place stress on the preceding syllable.

Table 5.18 lists adverbs that use these suffixes. As is seen, the stressed vowel is before the suffix. This vowel can have any vowel quality, including a schwa.

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Table 5.18: Irregular stress before the adverbializer suffixes

	-oren		-ap <sup>h</sup> ar		-abes
/a/	a'zad ազատ a'zad-oren 'freely' ազատօրէն		k <sup>h</sup> atf քաջ k <sup>h</sup> atf-ap <sup>h</sup> ar 'bravely' քաջաբար		nə'm <sup>h</sup> an նման nə'man-abes 'similarly' նմանապէս
/e/	t <sup>h</sup> e't <sup>h</sup> ev թեթեւ t <sup>h</sup> e't <sup>h</sup> ev-oren 'lightly' թեթեւօրէն		əŋ'ger ընկեր əŋ'ger-ap <sup>h</sup> ar 'friendly' ընկերաբար		'vertf վերջ 'vertf-abes 'finally' վերջապէս
/i/	naze'li նազելի naze'lij-oren 'graciously' նազելիօրէն		tsə'ri ծրի tsə'rij-ap <sup>h</sup> ar 'for free' ծրիաբար		'isk իսկ 'isk-abes 'really' իսկապէս
/o/	het <sup>h</sup> a'nos հեթանոս het <sup>h</sup> a'nos-oren 'heathenishly' հեթանոսօրէն		so'vor սովոր so'vor-ap <sup>h</sup> ar 'usually' սովորաբար		moda'vor մօտաւոր moda'vor-abes 'approximately' մօտաւորապէս
/u/	'dzujl ծոյլ 'dzul-oren 'lazily' ծուլօրէն		amu'sin ամուսին a'musn-ap <sup>h</sup> ar 'maritably' ամուսնաբար		əs'kuf զգոյշ əs'kuf-abes 'carefully' զգուշապէս
/x/	a'rydz առիւծ a'rydz-oren 'lion-like' առիւծօրէն		ax'pyr աղբիւր ax'pyr-ap <sup>h</sup> ar 'abundantly' աղբիւրաբար		t <sup>h</sup> yr դիւր t <sup>h</sup> yr-abes 'easily' դիւրապէս
/ə/	'lurtf լուրջ 'lortf-oren 'seriously' լրջօրէն		t <sup>h</sup> ə't <sup>h</sup> u թթու t <sup>h</sup> ətf-ap <sup>h</sup> ar 'sourly' թթուաբար		az'niv ազնիւ az'nəv-abes 'sincerely' ազնուապէս

Interestingly, there are some adjectives that have an epenthetic schwa in the last syllable like *p<sup>h</sup>artsə* 'high' (Table 5.19). The schwa is usually deleted before vowel-initial suffixes *p<sup>h</sup>artsr-oren* but colloquial pronunciations can allow the schwa to stay. When the schwa is present, the schwa takes stress because it is right before the adverb suffix: *p<sup>h</sup>ar'tsə*-oren.

Table 5.19: Stress on schwas before adverbializer suffixes

'b <sup>h</sup> arən	'bitter'	դանն	p <sup>h</sup> artsər	'high'	բարձր
t <sup>h</sup> arən-ap <sup>h</sup> ar	'bitterly'	դաննապէս	p <sup>h</sup> artsr-oren	'highly'	բարձրօրէն
t <sup>h</sup> a'rən-ap <sup>h</sup> ar			p <sup>h</sup> ar'tsər-oren		
p <sup>h</sup> ok <sup>h</sup> ər	'small'	փոքր	k <sup>h</sup> axtsər	'sweet'	փոքր
p <sup>h</sup> ok <sup>h</sup> r-ap <sup>h</sup> ar	'small-ly'	փոքրաբար	k <sup>h</sup> axtsr-oren	'sweetly'	քաղցրօրէն
p <sup>h</sup> o'k <sup>h</sup> ər-ap <sup>h</sup> ar			k <sup>h</sup> ax'tsər-oren		
dʒanər	'heavy'	ծանր	t <sup>h</sup> antsər	'dense'	թանձր
dʒanr-abes	'heavily'	ծանրապէս	t <sup>h</sup> antsr-ap <sup>h</sup> ar	'densely'	թանձրաբար
dʒa'nər-abes			t <sup>h</sup> an'tsər-ap <sup>h</sup> ar		

These adverbializer suffixes interact paradoxically with destressed vowel reduction (Table 5.20). For a root with a final high vowel like *χist* 'serious', the high vowel is stressed when unsuffixed. As detailed in [cite chapter on reduction](#), when a derivational suffix is added to such roots, we see stress shift and reduction. The high vowel is either reduced to a schwa or deleted. For these adverbializers, they don't trigger stress shift but they do trigger reduction: *χəst-oren*. Stress is then on the pre-suffix vowel. Some closed set of roots also show reduction of destressed *e* to *i*. This reduction overapplies before adverbial suffixes.

Table 5.20: Paradoxical application of destressed high vowel reduction and destressed midvowel reduction

'χist	'rigorous'	han'k <sup>h</sup> ist	'comfortable'	jera'zɪft	'musician'
	խիստ		հանգիստ		երաժիշտ
'χəst-oren	'rigorously'	han'k <sup>h</sup> əst-ap <sup>h</sup> ar	'comfortable'	jera'zəft-abes	'musically'
	խստօրէն		հանգստաբար		երաժշտապէս
ha'dug	'particular'	jertʃa'nig	'fortunate'	k <sup>h</sup> e'εtsig	'beautiful'
	յատուկ		երջանիկ		գեղեցիկ
'hadg-oren	'in particular'	jertʃa'ngg-ap <sup>h</sup> ar	'fortunately'	k <sup>h</sup> e'εetsk-abes	'beautifully'
	յատկօրէն		երջանկաբար		գեղեցկապէս
də-'k <sup>h</sup> ed	'stupid'	aŋ-'k <sup>h</sup> ed	'ignorant'	o'ren	'law (archaic)'
	սգէտ		անգէտ		օրէն
də-'k <sup>h</sup> id-oren	'stupid-ly'	aŋ-'k <sup>h</sup> id-ap <sup>h</sup> ar	'ignorantly'	o'rin-abes	'legally'
	սգիտօրէն		անգիտաբար		օրինապէս

Synchronically, it is a paradox why these roots change or delete their vowel in these adverbs. It is a paradox because the adverbializer suffixes do not trigger stress shift in the modern language. But diachronically or historically, this reduction is because of how the adverbializers likely did trigger stress shift: [χist]

→ //χəst-o'ren//. Reduction applied at this earlier stage. When the modern language turned these suffixes into unstressed suffixes, the reduction still applied: //χəst-o'ren// → [χəst-oren]

**history of these suffixes, and variation**

The suffixes *-oren*, *-ap<sup>h</sup>ar*, *-abes* are usually used to form adverbs (Table 5.21). But there are a handful of words where these suffixes are used to form nouns. For *-ap<sup>h</sup>ar*, the suffix developed the function to designate the name of Armenian dialects, possibly due to close link between adverbs and speech, e.g., to speak in the modern way vs. the classical way. For the suffix *oren*, this morpheme can act as a noun root for ‘law’. Here, the noun-version of these suffixes does not cause irregular stress. These nouns take regular final stress.

Table 5.21: Words with where the adverbializer suffix acts as a non-adverbializer

/oren/ as noun root:	o'ren	‘law (archaic)’	օրէն
	an-o'ren	‘illegal’	անօրէն
	'dun	‘house’	տուն
	dən-o'ren	‘director’	տնօրէն
/oren/ as nominalizer:	ra'mig	‘vulgar’	ռամիկ
	ramg-o'ren	‘Middle Armenian’	ռամկօրէն
	k <sup>h</sup> ər-a'p <sup>h</sup> ar	‘Classical Armenian’	գրաբար
	a'fχar	‘world’	աշխարհ
	a'fχar-a'p <sup>h</sup> ar	‘Modern Armenian’	աշխարհաբար

For the adverbializer suffixes (23), it is very difficult to naturally add any inflection after them. The most typical use of these adverbs is to simply add these words to a sentence, to modify a verb. The clitic ‘also’ can also be added. When the suffix is cliticized, we get regular final stress on the word, before the clitic.

- (23) a. u'raχ-oren dun jeg-a-n  
happy-ADVZ house come.AOR-PST-3PL  
‘We happily came home.’  
Ուրախօրէն տուն եկան:
- b. jev arak<sup>h</sup>-o'ren=al ər-i-n  
and quick-ADVZ=also do.AOR-PST-3PL  
‘And they did it quickly too.’  
Արագօրէն ալ ըրին:

### 5.3.3 Hypocoristic suffix

Given a name like [marjam] ‘Mariam’, a hypocoristic or nickname is formed by taking the first syllable of the word and adding the suffix -o: [‘mar-o]. The suffix -o irregularly assigns stress before it on the first syllable.

For morphological and phonological rules on how to form nicknames, see [cite chapter nickname](#). This section focuses on the stress pattern of these words. Table 5.22 provides examples of some common nicknames, adapted and augmented from (Vaux 1998: 247).

Table 5.22: Sample of common nicknames with -o and irregular stress

mar‘jam	Մարիամ	‘hajg	Հայկ	‘vart <sup>h</sup>	Վարդ
‘mar-o	Մարօ	‘hajg-o	Հայկօ	‘vart <sup>h</sup> -o	Վարդօ
naza‘ret <sup>h</sup>	Նազարէթ	ant <sup>h</sup> ra‘nig	Անդրանիկ	arfa‘lujs	Արշալոյս
‘naz-o	Նազօ	‘ant <sup>h</sup> -o	Անդօ	‘arf-o	Արշօ
jekisa‘p <sup>h</sup> et <sup>h</sup>	Եղիսաբէթ	man‘vel	Մանուէլ	sam‘vel	Սամուէլ
‘jexs-o	Եղսօ	‘man-o	Մանօ	‘sam-o	Սամօ
bed‘ros	Պետրոս	set <sup>h</sup> ‘rag	Սեդրակ	dik <sup>h</sup> ‘ran	Տիգրան
‘bed-o	Պետօ	‘set <sup>h</sup> -o	Սեդօ	‘dik <sup>h</sup> -o	Տիգօ
ap <sup>h</sup> raham	Աբրահամ	ar‘men	Արմէն	sar‘k <sup>h</sup> is	Սարգիս
‘apr-o	Աբրօ	‘arm-o	Արմօ	‘sak <sup>h</sup> -o	Սագօ

It is rather rare to find a hypocoristic where the initial syllable has a schwa. One common name is the nickname of Մկրտիչ: [mægər’ditʃ] in Western, [mækər’titʃ<sup>h</sup>] in Eastern. The nickname form uses a schwa. Vaux reports that this nickname stresses the schwa in Eastern: [‘mæk-o]. But in HD’s Western judgments, stress is on the suffix: [mə’g-o]. Due to limited data, it is unknown if schwas in nicknames generally resist stress in Western Armenian.

Hypocoristics take initial stress when used in isolation (citation form) and as vocatives in direct address (24a). Throughout this section, we gloss the hypocoristic ‘mar-o as ‘Maro-HCR’. See Section §6.6.4 for more on vocatives.

- (24) a. pa’rev, ‘mar-o  
           hello Maro-HCR  
           ‘Hello, Maro.’  
           Բարեւ, Մարօ:

Like ordinals, we treat the suffix -o as irregularly prestressing. Also like ordinals, the prestressing behavior is lost when the hypocoristic is further inflected

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or encliticized (25). Note how a glide [j] is epenthesized between the -o and a vowel.

- (25) a. *mar-o-ji-n*                      *k<sup>h</sup>irk<sup>h</sup> däv-i*  
 Maro-HCR-DAT-DEF book give.AOR-1SG  
 ‘I gave books to Maro.’  
 Մարոյին գիրք տուի:
- b. *mar-o-je-n*                      *k<sup>h</sup>irk<sup>h</sup> ar-i*  
 Maro-HCR-DAT-DEF book take.AOR-1SG  
 ‘I got books from Maro.’  
 Մարոյէն գիրք առի:
- c. *anun-əs*                      *ma'r-o=je*  
 name-POSS.1SG Maro-HCR=is  
 ‘My name is Maro.’  
 Անունս Մարո է:

Hypocoristics differ from ordinals however in that hypocoristics end in a vowel (26). This has significance for some types of phonologically-conditioned allomorphy. The definite suffix and the possessives surface with a schwa after consonant-final bases like ordinals: definite -ə, 1st possessive -əs, 2nd possessive -ət<sup>h</sup>. They surface as a consonant after vowel-final bases like hypocoristics: -n, -s, -t<sup>h</sup>. When these consonantal suffixes are added to the hypocoristic suffix -o, we see stress shift to the suffix -o.<sup>5</sup>

- (26) a. *mar-ó-n*                      *jeg-a-v*.  
 Maro-HCR-DEF come.AOR-PST-3SG  
 ‘Maro came.’  
 Մարոն եկաւ:
- b. *im*                      *mar-ó-s*                      *jeg-a-v*  
 my.GEN Maro-HCR-POSS.1SG come.AOR-PST-3SG  
 ‘My Maro came (as opposed to the Maro who you know).’  
 Իմ Մարոս եկաւ:
- c. *k<sup>h</sup>u*                      *ma'r-o-t<sup>h</sup>*                      *jeg-a-v*  
 your.GEN.SG Maro-HCR-POSS.2SG come.AOR-PST-3SG  
 ‘Your Maro came (as opposed to the Maro who I know).’  
 Զո՛ւ Մարո՞դ եկաւ:

<sup>5</sup>Proper names take the definite suffix when used as the subject of the sentence.

## 5.4 Irregular stress in verb inflection

In their inflectional paradigm, verbs show regular final stress in almost all possible inflected forms. There are however some cases of exception: negated finite forms, negated periphrastic forms, prohibitives (negative imperatives), and the past imperfective. For the negation-related forms, stress is on the vowel which is either in or close to the relevant negation morpheme. For the past imperfective, stress is on the (non-final) theme vowel. The interaction of irregular stress of negation, the past imperfective, and clitics is also quite complicated.

### 5.4.1 Negative finite forms

Verbs show the following basic synthetic forms: present, past imperfective, and past perfective. The past imperfective has irregular stress on the theme vowel; we discuss that later in §5.4.4.2. The other two forms take regular final stress and we focus on them. In their negated forms, the prefix *tʃ(ə)-* is added (Tbale 5.23). The schwa is used if the verb starts with a consonant. Primary stress is on the first syllable, on the vowel that is next to the negation prefix. There is some level of secondary stress on the rightmost non-schwa.

Table 5.23: Negation stress in negated finite forms of verbs

		C-initial 'to measure'	V-initial 'to hate'	
Infinitive		<i>tʃa'p<sup>h</sup>-e-l</i>	<i>a'd-e-l</i>	չափել, ատել
Present 3Pl	Pos.	<i>tʃa'p<sup>h</sup>-e-n</i>	<i>a'd-e-n</i>	չափեն, ատեն
	Neg.	<i>tʃə-tʃa'p<sup>h</sup>-e-n</i> (NEG-) <sub>✓</sub> -TH-3PL	<i>tʃ-a'd-e-n</i>	չչափեն, չատեն
Past Perf. 3PL	Pos.	<i>tʃap<sup>h</sup>-e-ts-i-n</i>	<i>ad-e-ts-i-n</i>	չափեցին, ատեցին
	Neg. Std.	<i>tʃə-tʃap<sup>h</sup>-e-ts-i-n</i>	<i>tʃ-ad-e-ts-i-n</i>	չչափեցին, չատեցին
	Neg. Coll.	<i>tʃi-tʃap<sup>h</sup>-e-ts-i-n</i> (NEG-) <sub>✓</sub> -TH-AOR-PST-3PL		չի չափեցին

Note how the C-initial verb is a near-minimal pair against the negated V-initial verb: *[tʃa'p<sup>h</sup>-e-n]* vs. *[tʃ-ad-e-n]*. Full paradigms for these negated forms are founded in the relevant morphology sections [cite chapter on verbal inflection paradigm](#)

For the past perfective, the standard pronunciation of the negation prefix is just *tʃə-* before a consonant. But colloquial speech allows the form *tʃi* instead.

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Stress is still on the prefix. This colloquial form is homophonous with the present 3SG negated auxiliary *tʃ-i*; see paradigms in **cite auxiliary form chapter with chi**. It's possible that this colloquial form developed in order to avoid having a stress schwa.

For the words in Table 5.23, the root's first vowel was /a/ and the root was monosyllabic. But negation takes stress regardless of the type of vowel or word size (Table 5.24). We illustrate below with just negative forms. For space we don't gloss the following examples, but the segmentation is the same as in Table 5.23.

Table 5.24: Initial stress in negated finite forms regardless of root vowel quality

	Present 3PL	Past perfective 3PL	
/a/	<i>tʃə-na<sub>j</sub>-i-n</i> <i>tʃ-aj<sub>r</sub>-i-n</i> <i>tʃ-art<sup>h</sup>u<sub>g</sub>-e-n</i>	<i>tʃə-na<sub>j</sub>-e-<sub>ts</sub>-a-n</i> <i>tʃ-aj<sub>r</sub>-e-<sub>ts</sub>-a-n</i> <i>tʃ-art<sup>h</sup>u<sub>g</sub>-e-<sub>ts</sub>-i-n</i>	'to look' նայիլ 'to burn' այրիլ 'to iron' արդուկել
/e/	<i>tʃə-de<sub>v</sub>-e-n</i> <i>tʃ-e<sub>p<sup>h</sup></sub>-e-n</i> <i>tʃ-er<sub>q</sub>z-e-n</i>	<i>tʃə-dev-e-<sub>ts</sub>-i-n</i> <i>tʃ-ep<sup>h</sup>-e-<sub>ts</sub>-i-n</i> <i>tʃ-er<sub>q</sub>z-e-<sub>ts</sub>-i-n</i>	'to last' տեւել 'to cook' եփել 'to dream' երազել
/i/	<i>tʃə-si<sub>r</sub>-e-n</i> <i>tʃ-if<sub>χ</sub>-e-n</i> <i>tʃ-irak<sup>h</sup>or<sub>dz</sub>-e-n</i>	<i>tʃə-sir-e-<sub>ts</sub>-i-n</i> <i>tʃ-if<sub>χ</sub>-e-<sub>ts</sub>-i-n</i> <i>tʃ-irak<sup>h</sup>ord<sub>z</sub>-e-<sub>ts</sub>-i-n</i>	'to like' սիրել 'to rule' իշխել 'to effect' իրագործել
/o/	<i>tʃə-p<sup>h</sup>o<sub>χ</sub>-e-n</i> <i>tʃ-ok<sup>h</sup><sub>n</sub>-e-n</i> <i>tʃ-od<sub>z</sub>a<sub>n</sub>-e-n</i>	<i>tʃə-p<sup>h</sup>o<sub>χ</sub>-e-<sub>ts</sub>-i-n</i> <i>tʃ-ok<sup>h</sup><sub>n</sub>-e-<sub>ts</sub>-i-n</i> <i>tʃ-od<sub>z</sub>a<sub>n</sub>-e-<sub>ts</sub>-i-n</i>	'to change' փոխել 'to help' օգնել 'to anoint' օծանել
/u/	<i>tʃə-p<sup>h</sup>u<sub>z</sub>-e-n</i> <i>tʃ-u<sub>z</sub>-e-n</i> <i>tʃ-us<sub>a</sub>n-i-n</i>	<i>tʃə-p<sup>h</sup>u<sub>z</sub>-e-<sub>ts</sub>-i-n</i> <i>tʃ-uz-e-<sub>ts</sub>-i-n</i> <i>tʃ-us<sub>a</sub>n-e-<sub>ts</sub>-a-n</i>	'to heal' բուժել 'to want' ուզել 'to learn' ուսանիլ
/y/	<i>tʃə-h<sub>y</sub>s-e-n</i>	<i>tʃə-h<sub>y</sub>s-e-<sub>ts</sub>-i-n</i>	'to weave' հիւսել
/ə/	<i>tʃə-lə<sub>z</sub>-e-n</i> <i>tʃ-ənd<sub>r</sub>-e-n</i> <i>tʃ-ənd<sub>z</sub>a<sub>j</sub>-e-n</i>	<i>tʃə-lə<sub>z</sub>-e-<sub>ts</sub>-i-n</i> <i>tʃ-ənd<sub>r</sub>-e-<sub>ts</sub>-i-n</i> <i>tʃ-ənd<sub>z</sub>a<sub>j</sub>-e-<sub>ts</sub>-i-n</i>	'to lick' լզել 'to choose' ընտրել 'to offer' ընծայել

For the past perfective form (27), these forms can be elicited in isolation without any special sentence structure.

- (27) *tʃə-tʃap<sup>h</sup>-e-<sub>ts</sub>-i-n*                      *jev tʃ-ad-e-<sub>ts</sub>-i-n*  
 NEG-measure-TH-AOR-PST-3PL and NEG-hate-TH-AOR-PST-3PL  
 'They didn't measure it, and they didn't hate it.'



Չչափեցին եւ չաւտեցին:

But for the present form (28), the prefixed negative form is restricted to relatively few contexts, such as the subjunctive present contexts. We give some examples below.

- (28) a. g-uz-e-m                      vor ʔə-ʔəpʰ-e-n/ʔə-ad-e-n  
 IND-want-TH-1SG that NEG-measure-TH-3PL/NEG-hate-TH-3PL  
 ‘I want them to not measure/hate.’  
 Կ’ուզեմ որ չչափեն/չաւտեն:
- b. tʰox ʔə-ʔəpʰ-e-n/ʔə-ad-e-n  
 let NEG-measure-TH-3PL/NEG-hate-TH-3PL  
 ‘Let them not measure/hate.’  
 Թող չչափեն/չաւտեն:

Another common use of these negative present forms is in the future (Table 5.25). The future is made up of the particle *bidi* and then the verb. In standard speech, the negation prefix is added to the verb. In colloquial speech, the negation prefix can be added to the future particle *bidi*. In both cases, the negation prefix attracts stress (Աճառյան 1971a: 339).

Table 5.25: Negation stress in the negated future

		C-initial ‘to measure’		V-initial ‘to hate’		
Infinitive		ʔəpʰ-e-l		aʔ-d-e-l		չափել, աւտել
Fut 3PL	Pos.	bidi	ʔəpʰ-e-n	bidi	aʔ-d-e-n	պիտի չափեն/աւտեն
Fut 3PL	Neg. Std.	bidi	ʔə-ʔəpʰ-e-n	bidi	ʔə-aʔ-d-e-n	պիտի չչափեն/չաւտեն
Fut 3PL	Neg. Coll.	ʔə-bidi	ʔəpʰ-e-n	ʔə-bidi	aʔ-d-e-n	չպիտի չափեն/աւտեն
		(NEG)-FUT √-TH-3PL				

When present negatives are used in certain types of sentences (29), they can either optionally get final stress (29a, 29b) or obligatorily get final stress (29c) (Ավետիսյան 2011: 67, Աճառյան 1971a: 338).<sup>6</sup> For example, if the negative verb is part of a conditional sentence or a wish-making sentence (29a, 29b), then it is possible to have final stress. If the verb is used to form a direct command, then final stress is obligatory (29c). We think that in these contexts, the negation suffix is supposed to assign initial stress, but final stress is assigned because of the special intonational structure of the sentence.

<sup>6</sup> Adjarian’s grammar of old Istanbul Armenian also reports the contrast on page 148 **double check**

- (29) a.  $\text{jet}^{\text{h}}\text{e } \widehat{\text{tʃ}}\text{-}\widehat{\text{a'd-e-n}}$ ,       $\text{gə-dʒaχ-e-m}$   
 $\text{jet}^{\text{h}}\text{e } \widehat{\text{tʃ}}\text{-}\widehat{\text{ad-e-n}}$ ,       $\text{gə-dʒaχ-e-m}$   
 if    NEG-hate-TH-3PL, IND-sell-TH-1SG  
 ‘If they don’t hate it, I’ll sell it.’  
 Եթէ չատեն, կը ծախսմ:
- b.  $\text{jerani } \widehat{\text{tʃ}}\text{-}\widehat{\text{a'd-e-n}}$   
 $\text{jerani } \widehat{\text{tʃ}}\text{-}\widehat{\text{ad-e-n}}$   
 I.wish NEG-hate-TH-3PL  
 ‘I wish they don’t hate it.’  
 Երանի չատեն:
- c.  $\widehat{\text{tʃ}}\text{-}\widehat{\text{a'd-e-s}}$ ,  
 NEG-hate-TH-2SG  
 ‘Don’t you dare hate it!’  
 Չատես:

Cross-linguistically, it is common to find negation morphemes triggering special stress patterns. For example, Persian uses a stressed negation prefix (*Kahne-muyipour* 2003), and Turkish *stress turkish negation*.

These negative finite forms can undergo cliticization (30). Adding the clitic ‘also’ doesn’t shift stress, but the secondary stress of the final vowel feels stronger. Adding the subjunctive clitic however causes stress shift. The clitic =*ne* is generally special in being able to cause stress shifts (§5.2.2.2, §6.6.1).

- (30) a.  $\widehat{\text{tʃ}}\text{-}\widehat{\text{ad-e-}} \widehat{\text{ts-i-n=al}}$   
 NEG-hateTH-AOR-PST-3PL=also  
 ‘They also didn’t hate it.’  
 Չատեցին ալ:
- b.  $\text{bidi } \widehat{\text{tʃ}}\text{-}\widehat{\text{art}^{\text{h}}\text{u,g-e-n=al}}$ .  
 FUT NEG-ironTH-3PL=also  
 ‘They also won’t iron it.’  
 Պիտի չարդուկեն ալ:
- c.  $\text{jet}^{\text{h}}\text{e } \widehat{\text{tʃ}}\text{-}\widehat{\text{a'd-e-n=ne}}$       /  $\widehat{\text{tʃ}}\text{-}\widehat{\text{art}^{\text{h}}\text{u'g-e-n=ne}}$   
 if    NEG-hateTH-3PL=SBJV / NEG-ironTH-3PL=SBJV  
 ‘If they won’t hate/iron it.’  
 Եթէ չատեն/չարդուկեն նէ:

The above is for negative finite forms. For non-finite forms, adding the negation prefix doesn’t cause any irregular stress (Table 5.26). Such non-finite forms

include infinitives and participles. Even if non-finite form is further inflected, we still see regular stress on the rightmost non-schwa.

Table 5.26: No stress shift in negated non-finite forms

		C-initial 'to look'	V-initial 'to burn'	
Infinitive	Pos.	na'j-i-l	aj'r-i-l	նայիլ, այրիլ
	Neg.	tʃə-na'j-i-l	tʃə-aj'r-i-l	չնայիլ, չայրիլ
	Neg.+Def.	tʃə-na'j-i-l-ə (NEG-)/-TH-INF(-DEF)	tʃə-aj'r-i-l-ə	չնայիլը, չայրիլը
Subject ptcp.	Pos.	na'j- <b>o</b> x	aj'r- <b>o</b> x	նայող, այրող
	Neg.	tʃə-na'j- <b>o</b> x	tʃə-aj'r- <b>o</b> x	չնայող, չայրող
	Neg.+Def.	tʃə-na'j- <b>o</b> x-ə (NEG-)/-SPTCP(-DEF)	tʃə-aj'r- <b>o</b> x-ə	չնայողը, չայրողը
Resultative ptcp.	Pos.	na'j- <b>ad</b> z	aj'r- <b>ad</b> z	նայած, այրած
	Neg.	tʃə-na'j- <b>ad</b> z	tʃə-aj'r- <b>ad</b> z	չնայած, չայրած
	Neg.+Def.	tʃə-na'j- <b>ad</b> z-ə (NEG-)/-RPTCP(-DEF)	tʃə-aj'r- <b>ad</b> z-ə	չնայածը, չայրածը

Thus the generalization is that in Western Armenian, the negation prefix takes stress when the verb is inflected for tense-agreement. Non-finite forms like participles don't trigger any special negation stress. The attraction of stress towards the negative in Western Armenian has been reported in piecemeal fashion in few published sources. Most sources emphasize the fact that the initial schwa is stressed in the negative (Աճառյան 1971a: 322, cf.67 Ավետիսյան 2011. But for Eastern Armenian, it seems that the negation prefix does not trigger irregular stress. cite eastern data from grammars

#### 5.4.2 Negative periphrastic forms

For verbal inflection, some paradigm cells utilize periphrasis, meaning that the 'word' is made up an auxiliary that carries tense-agreement, while the verb is in a non-finite form. In the positive form, stress is on the verb, not the cliticized auxiliary. When these periphrastic forms are negated, the negation prefix is added to the auxiliary. This auxiliary then takes primary stress, while the verb takes secondary stress. We describe the following negative periphrastic tenses: negative indicative present, negative present perfect, and negative present perfect evidential.

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Consider first the negative indicative present (Table 5.27). This consists of a negated auxiliary and the connegative. The negated auxiliary is made up of the negation prefix *tʃ-* and the auxiliary *-e-*. The auxiliary carries tense-agreement. The connegative is a special form of the verb, made up of the verb stem and the suffix *-r*. Stress is on the auxiliary.

Table 5.27: Stress on the negative auxiliary in the negative indicative present

	Infinitive	Neg. Indc. Pres. 3SG	Neg. Indc. Pres. 3PL
‘to measure’	<i>tʃa<sup>h</sup>-e-l</i> չափել	<i>tʃ-i tʃa<sup>h</sup>-e-r</i> չի չափեր	<i>tʃ-e-n</i> <i>tʃa<sup>h</sup>-e-r</i> չեն չափեր
‘to hate’	<i>a<sup>d</sup>-e-l</i> ատել	<i>tʃ-a<sup>d</sup>-e-r</i> չ’ատեր	<i>tʃ-e-n</i> <i>a<sup>d</sup>-e-r</i> չեն ատեր
	√-TH-INF	NEG(-is)√-TH-CN	NEG-is-3PL      √-TH-CN

For both C-initial and V-initial verbs, the paradigm of negative indicative present is largely the same. But in the 3SG (Table 5.28), the negative auxiliary is a stressed word *tʃ-i* before C-initial verbs, while it is a stressed prefix *tʃ-* before V-initial verbs. This stress behavior applies regardless of the type of root-initial vowel. We illustrate below with the 3SG forms.

## 5.4 Irregular stress in verb inflection

Table 5.28: Initial stress in negative present indicative 3SG regardless of root vowel quality

/ɑ/	tʃ-i na.j-i-r	‘he doesn’t look’	չի նայիր
	tʃ-aj,r-i-r	‘it doesn’t burn’	չ’այրիր
	tʃ-art <sup>h</sup> u,g-e-r	‘he doesn’t iron’	չ’արդուկեր
/e/	tʃi de,v-e-r	‘it doesn’t last’	չի տներ
	tʃ-e,p <sup>h</sup> -e-r	‘he doesn’t cook’	չ’եփեր
	tʃ-erɑ,z-e-r	‘he doesn’t dream’	չ’երազեր
/i/	tʃi si,r-e-r	‘he doesn’t like’	չի սիրեր
	tʃ-ij,χ-e-r	‘he doesn’t rule’	չ’իշխեր
	tʃ-irak <sup>h</sup> or,dz-e-r	‘he doesn’t practice’	չ’իրագործեր
/o/	tʃi p <sup>h</sup> o,χ-e-r	‘he doesn’t change’	չի փոխեր
	tʃ-ok <sup>h</sup> ,n-e-r	‘he doesn’t help’	չ’օգներ
	tʃ-odza,n-e-r	‘he doesn’t anoint’	չ’օծաներ
/u/	tʃi p <sup>h</sup> u,z-e-r	‘he doesn’t heal’	չի բուժեր
	tʃ-u,z-e-r	‘he doesn’t want’	չ’ուզեր
	tʃ-usɑ,n-i-r	‘he doesn’t learn’	չ’ուսանիր
/y/	tʃi hy,s-e-r	‘he doesn’t weave’	չի հիսել
/ə/	tʃi lə,z-e-r	‘he doesn’t lick’	չի լզեր
	tʃ-ənd,r-e-r	‘he doesn’t choose’	չ’ընտրեր
	tʃ-əndza,j-e-r	‘he doesn’t offer’	չ’ընծայեր

Another periphrastic construction is the present perfect (Table 5.29), made up of the resultative participle and the auxiliary. The participle can use either the suffix *-adz* or the evidential suffix *-er*. In the positive form, the auxiliary follows the verb, is unstressed, and is a clitic. In the negative form, the auxiliary takes the negation prefix, precedes the verb, and is stressed.

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Table 5.29: Stress on the negative auxiliary in the negative present perfect

	C-initial 'to measure'	V-initial 'to hate'	
Infinitive	$\widehat{\text{tʃa}^{\text{h}}\text{p}^{\text{h}}\text{-e-l}}$	$\text{a}^{\text{h}}\text{d-e-l}$	չափել, ատել
Pres. Perf. 3PL with evidential form	$\widehat{\text{tʃa}^{\text{h}}\text{p}^{\text{h}}\text{-adz}}$ e-n $\widehat{\text{tʃa}^{\text{h}}\text{p}^{\text{h}}\text{-er}}$ e-n √-RPTCP/EPTCP is-3PL	$\text{a}^{\text{h}}\text{d-adz}$ e-n $\text{a}^{\text{h}}\text{d-er}$ e-n	չափած/ատած են չափեր/ատեր են
Neg. Pres. Perf. 3PL with evidential form	$\widehat{\text{tʃ-e-n}}$ $\widehat{\text{tʃa}^{\text{h}}\text{p}^{\text{h}}\text{-adz}}$ $\widehat{\text{tʃ-e-n}}$ $\widehat{\text{tʃa}^{\text{h}}\text{p}^{\text{h}}\text{-er}}$ NEG-is-3PL √-RPTCP/EPTCP	$\widehat{\text{tʃ-e-n}}$ $\text{a}^{\text{h}}\text{d-adz}$ $\widehat{\text{tʃ-e-n}}$ $\text{a}^{\text{h}}\text{d-er}$	չեն չափած, չեն ատած չեն չափեր, չեն ատեր

For the negative present and negative present perfect, the auxiliary is stressed and monosyllabic. There are also some negative periphrastic constructions where the negative auxiliary is bisyllabic because it includes the past suffix /-i-/ (Table 5.30).<sup>7</sup> Stress is on the first vowel of the auxiliary. Such constructions include the negative indicative past imperfective and the negative past perfect.

Table 5.30: Initial stress on the negative auxiliary in the negative indicative past imperfective and negative past perfect

	C-initial 'to measure'	V-initial 'to hate'	
Infinitive	$\widehat{\text{tʃa}^{\text{h}}\text{p}^{\text{h}}\text{-e-l}}$	$\text{a}^{\text{h}}\text{d-e-l}$	չափել, ատել
Neg. Indc. Past Impf. 3PL	$\widehat{\text{tʃ-e-ji-n}}$ $\widehat{\text{tʃa}^{\text{h}}\text{p}^{\text{h}}\text{-e-r}}$ NEG-is-PST-3PL √-TH-CN	$\widehat{\text{tʃ-e-ji-n}}$ $\text{a}^{\text{h}}\text{d-e-r}$	չէին չափեր/ատեր
Past Perf. 3PL with evidential form	$\widehat{\text{tʃa}^{\text{h}}\text{p}^{\text{h}}\text{-adz}}$ e-ji-n $\widehat{\text{tʃa}^{\text{h}}\text{p}^{\text{h}}\text{-er}}$ e-ji-n √-RPTCP/EPTCP is-PST-3PL	$\text{a}^{\text{h}}\text{d-adz}$ e-ji-n $\text{a}^{\text{h}}\text{d-er}$ e-ji-n	չափած/ատած էին չափեր/ատեր էին
Neg. Pres. Perf. 3PL with evidential form	$\widehat{\text{tʃ-e-ji-n}}$ $\widehat{\text{tʃa}^{\text{h}}\text{p}^{\text{h}}\text{-adz}}$ $\widehat{\text{tʃ-e-ji-n}}$ $\widehat{\text{tʃa}^{\text{h}}\text{p}^{\text{h}}\text{-er}}$ NEG-is-PST-3PL √-RPTCP/EPTCP	$\widehat{\text{tʃ-e-ji-n}}$ $\text{a}^{\text{h}}\text{d-adz}$ $\widehat{\text{tʃ-e-ji-n}}$ $\text{a}^{\text{h}}\text{d-er}$	չէին չափած/ատած չէին չափեր/ատեր

These periphrastic forms can be cliticized (31). Some clitics and clitic clusters can be added directly to the auxiliary. We don't see stress shift. These clitics include the clitic 'also' and the question particle.

<sup>7</sup>The negative past auxiliary is bisyllabic for all but the 3SG: [ $\widehat{\text{tʃ-e-r}}$ ] չէր.

- (31) a.  $\widehat{\text{tj-e-n=al}}$  /  $\widehat{\text{tj-e-ji-n=al}}$   $\widehat{\text{tja,p}^{\text{h-e-r}}}$   
 NEG-is-3PL=also / NEG-is-PST-3PL=also measure-TH-CN  
 ‘They also won’t/wouldn’t measure it.’  
 Չեն/Չէին ալ չափեր:
- b.  $\widehat{\text{tj-e-n=mə}}$  /  $\widehat{\text{tj-e-ji-n=mə}}$   $\widehat{\text{tja,p}^{\text{h-e-r}}}$   
 NEG-is-3PL=Q / NEG-is-PST-3PL=Q measure-TH-CN  
 ‘Won’t/Wouldn’t they measure it?’  
 Չե՞ն/Չէ՞ին մը չափեր:
- c.  $\widehat{\text{tj-e-n=al=mə}}$  /  $\widehat{\text{tj-e-ji-n=al=mə}}$   $\widehat{\text{tja,p}^{\text{h-e-r}}}$   
 NEG-is-3PL=also=Q / NEG-is-PST-3PL=also=Q measure-TH-CN  
 ‘Won’t/Wouldn’t they also measure it?’  
 Չե՞ն/Չէ՞ին ալ մը չափեր:

Some clitics can be added after the verb directly (32). The clitic ‘also’ (with the meaning of ‘anymore’), question particle, and progressive don’t trigger stress shift. HD perceives that secondary stress is however stronger on the verb with the clitic, than without the clitic.

- (32) a.  $\widehat{\text{tj-e-n}}\widehat{\text{tj-e-ji-n}}\widehat{\text{tja,p}^{\text{h-e-r=al}}}$   
 NEG-is-3PL / NEG-is-PST-3PL measure-TH-CN=also  
 ‘They won’t/wouldn’t measure it anymore.’  
 Չեն/Չէին չափեր ալ:
- b.  $\widehat{\text{tj-e-n}}$  /  $\widehat{\text{tj-e-ji-n}}\widehat{\text{tja,p}^{\text{h-e-r=mə}}}$   
 NEG-is-3PL / NEG-is-PST-3PL measure-TH-CN=Q  
 ‘Won’t/Wouldn’t they measure it?’  
 Չե՞ն/Չէ՞ին չափեր մը:
- c.  $\widehat{\text{tj-e-n}}$  /  $\widehat{\text{tj-e-ji-n}}\widehat{\text{tja,p}^{\text{h-e-r=gor}}}$   
 NEG-is-3PL / NEG-is-PST-3PL measure-TH-CN=PROG  
 ‘They aren’t/weren’t measuring it.’  
 Չեն/Չէին չափեր կոր:

The subjunctive clitic however does trigger a strong stress on the verb, and HD perceives that this stress is as strong as the auxiliary (33).

- (33) a.  $\text{jet}^{\text{h-e}}\widehat{\text{tj-e-n}}$  /  $\widehat{\text{tj-e-ji-n}}\widehat{\text{tja,p}^{\text{h-e-r=nə}}}$   
 if NEG-is-3PL / NEG-is-PST-3PL measure-TH-CN=SBJV  
 ‘If they won’t/wouldn’t measure it.’  
 Եթէ չեն/չէին չափեր նէ:

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- b. jet<sup>h</sup>e tʃ<sup>h</sup>-e-n / tʃ<sup>h</sup>-e-ji-n tʃap<sup>h</sup>-e-r=gor=nə  
 if NEG-is-3PL / NEG-is-PST-3PL measure-TH-CN=PROG=SBJV  
 ‘If they aren’t/weren’t measuring it.’  
 Եթէ չեն/չէին չափեր կոր նէ:

Eastern Armenian uses periphrasis too (Table 5.31). Western and Eastern however use periphrasis for different types of tenses, so we cannot directly compare the two varieties. For example, for the negative present indicative, whereas Western uses connegatives with *-r*, Eastern uses imperfective converbs with *-um*. Here too, we find primary stress on the monosyllabic negative auxiliary, and secondary stress on the verb’s final syllable. When the negative auxiliary is bisyllabic like in the past, stress is initial in Western but final in Eastern (Աճառյան 1971a: 338, Մարգարյան 1997: 77).

Table 5.31: Stress in negative periphrastic forms in Western vs. Eastern for the verb ‘to measure’ չափել

	Western		Eastern	
Infinitive		tʃa <sup>h</sup> p <sup>h</sup> -e-l		tʃ <sup>h</sup> a <sup>h</sup> p <sup>h</sup> -e-l
Neg. Indc. Pres. 3PL	tʃ <sup>h</sup> -e-n NEG-is-3PL չեն չափեր	tʃa <sup>h</sup> p <sup>h</sup> -e-r √-TH-CN	tʃ <sup>h</sup> -e-n NEG-is-3PL չեն չափում	tʃ <sup>h</sup> a <sup>h</sup> p <sup>h</sup> -um √-IMPF.CVB
Neg. Indc. Past Impf. 3PL	tʃ <sup>h</sup> -e-ji-n NEG-is-PST-3PL չէին չափեր	tʃa <sup>h</sup> p <sup>h</sup> -e-r √-TH-CN	tʃ <sup>h</sup> -e-ji-n NEG-is-PST-3PL չէին չափում	tʃ <sup>h</sup> a <sup>h</sup> p <sup>h</sup> -um √-IMPF.CVB

### 5.4.3 Prohibitive

Prohibitives or negative imperatives are made up of two elements: the particle *mi* and the verb (Table 5.32). The particle *mi* takes primary stress. The verb is inflected for either 2SG or 2PL, and it carries secondary stress. Similar facts are reported for Eastern Armenian (Աբեղյան 1933: 20, Մարգարյան 1997: 77).

Table 5.32: Negation stress in the prohibitive (negative imperative)

	C-initial ‘to measure’	V-initial ‘to hate’	
Infinitive	tʃa <sup>h</sup> p <sup>h</sup> -e-l	a <sup>h</sup> d-e-l	չափել, ատել
Prohibitive 2SG	‘mi tʃa <sup>h</sup> p <sup>h</sup> -e-r	‘mi a <sup>h</sup> d-e-r	Մի չափեր/ատեր
Prohibitive 2PL	‘mi tʃa <sup>h</sup> p <sup>h</sup> -e-k <sup>h</sup>	‘mi a <sup>h</sup> d-e-k <sup>h</sup>	Մի չափէք/ատէք



As for cliticization (34), no clitics can be added between the prohibitive particle and the verb. After the verb, some clitics like *=al* ‘also’ can be added with the meaning of ‘anymore’. There is no stress shift, but the secondary stress on the verb gets stronger.

- (34) 'mi tʃa.p<sup>h</sup>-e-r=al  
 PROH measure-TH-2SG=also  
 ‘Don’t measure anymore.’  
 Մի չափեր ալ:

#### 5.4.4 Irregular theme vowel stress in past imperatives

In the past imperfective inflection, irregular stress is on the non-final theme vowel of the verb. We go over the general behavior of irregular stress in §5.4.4.1. In §5.4.4.2, we document variation and complications when the past imperfective is in the negative. Here, the negation and theme vowel morphemes compete for irregular stress. Complications also arise in cliticization (§5.4.4.3).

##### 5.4.4.1 General rule of irregular stress in the past imperfective

In the present and past perfective, stress is regularly on the rightmost non-schwa vowel. This is either the theme vowel or the past suffix */-i-/*. But in the past imperfective (Table 5.33), stress is on irregularly on the theme vowel even though this vowel is not final. We show zero morphs for illustration.

Table 5.33: Irregular stress on theme vowels in the past imperfective for the verb [ad-e-l] ‘to hate’ *wutɬi*

	Present	Past Perf.	Past Impf.
1SG	ɑ'd-e-m	ɑd-e- <sup>ts</sup> -i-∅	ɑ'd-e-ji-∅
2SG	ɑ'd-e-s	ɑd-e- <sup>ts</sup> -i-r	ɑ'd-e-ji-r
3SG	ɑ'd-e-∅	ɑ'd-e- <sup>ts</sup>	ɑ'd-e-∅-r
1PL	ɑ'd-e-ŋk <sup>h</sup>	ɑd-e- <sup>ts</sup> -i-ŋk <sup>h</sup>	ɑ'd-e-ji-ŋk <sup>h</sup>
2PL	ɑ'd-e-k <sup>h</sup>	ɑd-e- <sup>ts</sup> -i-k <sup>h</sup>	ɑ'd-e-ji-k <sup>h</sup>
3PL	ɑ'd-e-n	ɑd-e- <sup>ts</sup> -i-n	ɑ'd-e-ji-n
	√-TH-AGR	√-TH-AOR-PST-AGR	√-TH-PST-AGR

For the past imperfective, stress is irregularly on the theme vowel. The past suffix *-i-* is present after the theme vowel for all but the 3SG. The theme vowel

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is the final vowel for the 3SG *a'd-e-r*, but is penultimate for all other person-numbers like 3PL *a'd-e-ji-n*.

This rule applies for both the /e/ and /a/ theme vowels (Table 5.34).<sup>8</sup> The root or stem can be monosyllabic or polysyllabic.

Table 5.34: Irregular theme vowel stress in past imperfective is agnostic to word size and vowel quality

/e/	Infinitive	Past Impf. 3SG	Past Impf. 3PL		
	si'r-e-l	si'r-e-Ø-r	si'r-e-ji-n	‘to like’	սիրել
	art <sup>h</sup> u'g-e-l	art <sup>h</sup> u'g-e-Ø-r	art <sup>h</sup> u'g-e-ji-n	‘to iron’	արդուկել
	adʒaba'r-e-l	adʒaba'r-e-Ø-r	adʒaba'r-e-ji-n	‘to hurry’	աճապարել
/a/	avedara'n-e-l	avedara'n-e-Ø-r	avedara'n-e-ji-n	‘to evangelize’	աւետարանել
	gar't <sup>h</sup> -a-l	gar't <sup>h</sup> -a-Ø-r	gar't <sup>h</sup> -a-ji-n	‘to read’	կարդալ
	apso's-a-l	apso's-a-Ø-r	apso's-a-ji-n	‘to pity’	ափսոսալ
	arak <sup>h</sup> an-a-l	arak <sup>h</sup> an-a-Ø-r	arak <sup>h</sup> an-a-ji-n	‘to get fast’	արագանալ
	aravodan-a-l	aravodan-a-Ø-r	aravodan-a-ji-n	‘to dawn’	առաւօտանալ

This rule applies for past imperfective as spoken for the modern Lebanese community, which HD is a member of. We’ve asked other Armenians and this rule applies for the Western Armenian communities in Syria (HS), Turkey (TT), and contemporary US (SC). This rule however doesn’t apply in France (AD). Furthermore, earlier sources of Western Armenian report regular final stress for these forms **add survey of bib for imperfective**.

Diachronically, it is likely that the past imperfectives once had final regular stress for all Western Armenian communities. Some communities then shifted to apply irregular stress on the theme vowel for some unknown reason. Evidence for this is that in Eastern Armenian, past imperfectives do not have irregular stress, but have regular final stress (Մարգարյան 1997: 77), e.g., Western [a'd-e-ji-n] but Eastern [ad-e-'ji-n] for past impf. 3PL of ‘to hate’.

### 5.4.4.2 Interaction of past imperfective stress and negation stress

The past imperfective can be used in two moods: indicative and subjunctive. The indicative takes the prefix *g(a)-*. The subjunctive lacks this prefix. In both forms, stress is on the theme vowel. The indicative is negated periphrastically (discussed in §5.4.2), while the subjunctive is negated with the prefix *tʃ(a)-*. In this negative

<sup>8</sup>The theme vowel /i/ cannot be used in the past imperfective; see **cite chapter on i theme vowel change**.

form (Table 5.35), HD feels that stress can variably jump between the negation prefix and the theme vowel.

Table 5.35: Irregular theme vowel stress in the past imperfective regardless of mood and polarity

	C-initial 'to measure' tʃa'p <sup>h</sup> -e-l	V-initial 'to hate' a'd-e-l	չափել, ատել
Infinitive			
Subj. Past. Impf. 3SG	tʃa'p <sup>h</sup> -e-Ø-r	a'd-e-Ø-r	չաթէր, ատէր
Ind. Past. Impf. 3SG	gə-tʃa'p <sup>h</sup> -e-Ø-r	g-a'd-e-Ø-r	կը չաթէր, կ'ատէր
Neg. Subj. Past. Impf. 3SG	tʃə-tʃa'p <sup>h</sup> -e-Ø-r tʃə-tʃap <sup>h</sup> -e-Ø-r IND/NEG-√-TH-PST-3SG	tʃ-a'd-e-Ø-r tʃ-ad-e-Ø-r	չչաթէր, չատէր
Subj. Past. Impf. 3PL	tʃa'p <sup>h</sup> -e-ji-n	a'd-e-ji-n	չաթէին, ատէին
Ind. Past. Impf. 3PL	gə-tʃa'p <sup>h</sup> -e-ji-n	g-a'd-e-ji-n	կը չաթէին, կ'ատէին
Neg. Subj. Past Impf. 3PL	tʃə-tʃa'p <sup>h</sup> -e-ji-n tʃə-tʃap <sup>h</sup> -e-ji-n IND/NEG-√-TH-PST-3SG	tʃ-a'd-e-ji-n tʃ-ad-e-ji-n	չչաթէին, չատէին

As discussed in §5.4.1, the negation prefix tends to attract stress in finite verbal forms such as the negative present or negative past perfective. But in the past imperfective, either the negation prefix and theme vowel can get stress.

To illustrate the stress variability (35), consider the two sentences below. HD feels that if the negative subjunctive form is used in a future context, then stress is preferably next to the negation prefix. In contrast, if the verb is part of a conditional sentence, then stress is on the theme vowel.

- (35) a. bidi tʃ-ad-e-Ø-r / tʃ-ad-e-ji-n  
FUT NEG-hate-TH-PST-3SG / NEG-hate-TH-PST-3PL  
'He was/They were going to not hate (it).'  
Պիտի չատէր/չատէին:
- b. jet<sup>h</sup>e tʃ-a'd-e-Ø-r / tʃ-a'd-e-ji-n  
if NEG-hate-TH-PST-3SG / NEG-hate-TH-PST-3PL  
'If he/they didn't hate (it).'  
Եթէ չատէր/չատէին:

It is possible that speakers choose which vowel to stress based on choosing which of the two meanings (negative vs. subjunctive) they want to stress. This type of variability seems appropriate for a larger-scale experiment.

For V-initial verbs like ‘to hate’, the negative subj. past impf. 3SG [tʃ-ɑ'd-e-Ø-r] is segmentally homophonous with the negative indicative homophonous with the negative ind. present 3SG [tʃ-ɑd-e-r]. The two forms differ however in stress (Table 5.36) (cf. Ավետիսյան 2011: 67). The subjunctive imperfective can variably place stress on the theme vowel, while the indicative negative places stress on the first root vowel.

Table 5.36: Segmental homophony but prosodic difference for negative subjunctive and negative indicative

	‘to hate’	
Infinitive	ɑ'd-e-l <adel>	√-TH-INF աւտել
Neg. Indc. Pres. 3SG	tʃ-ɑd-e-r <tʃ'ader>	NEG-√-TH-CN չ'աւտեր
Neg. Subj. Past Impf. 3SG	tʃ-ɑd-e-Ø-r tʃ-'d-e-r <tʃ'ader>	NEG-√-TH-PST-3SG չաւտեր

These forms are likewise distinguished orthographically. In the indicative 3SG, the negation prefix precedes an apostrophe. In the negative subjunctive, there is no apostrophe.

The indicative form was discussed in §5.4.1. The two types of verbs can be elicited in separate types of sentences (36). The indicative version is quite easy to elicit; essentially any sentence like ‘He doesn’t X’. The subjunctive is more subtle to elicit. We illustrate below. For illustration, we also provide forms with the 3PL where there is no homophony.

(36) a. Negative indicative

- i. mezi tʃ-ɑd-e-r / tʃ-e-n ɑd-e-r  
us.DAT NEG-hate-TH-CN / NEG-is-3PL hate-TH-CN  
‘He/They don’t hate us.’  
Մեզի չ'աւտեր/չեն աւտեր:

b. Contexts for negative subjunctive

- i. g-uz-e-ji vor tʃ-ɑ'd-e-Ø-r / tʃ-ɑ'd-e-ji-n  
g-uz-e-ji vor tʃ-ɑd-e-Ø-r / tʃ-ɑd-e-ji-n  
IND-want-TH-PST that NEG-hate-TH-PST-3SG / NEG-hate-TH-PST-3PL

‘I wanted him/they to not hate (it).’

Կ'ուզէի որ չատէր/չատէին:

- ii. t<sup>h</sup>oʁ tʃ-ɑ'd-e-ø-r / tʃ-ɑ'd-e-ji-n  
 t<sup>h</sup>oʁ tʃ-ɑd-e-r / tʃ-ɑd-e-ji-n  
 let NEG-hate-TH-PST-3SG / NEG-hate-TH-PST-3PL

‘Let him/them not hate (it).’

Թող չատէր/չատէին:

#### 5.4.4.3 Theme vowel stress and cliticization

The past imperfective has a rule of assigning irregular stress to the theme vowel. When these imperfective forms are cliticized, we can see subtle variations in stress placement.

Various clitics can be added after the past imperfective form (37). These clitics don't trigger stress shift, meaning that stress stays on the irregular theme vowel. As surveyed in §5.2, these clitics include the word ‘also’ =*al*, the conjunction =*u*, the question particle =*mə*, the progressive =*gor*, and the subjunctive clitic =*ne*.

- (37) a. g-ɑ'd-e-ø-r=al / g-ɑ'd-e-ji-n=al  
 IND-hate-TH-PST-3SG=also / IND-hate-TH-PST-3PL=also  
 ‘He was/They would also hate it.’  
 Կ'ատէր ալ: Կ'ատէին ալ:
- b. g-ɑ'd-e-ø-r=u gu-l-ɑ-ø-r  
 IND-hate-TH-PST-3SG=and IND-cry-TH-PST-3SG  
 ‘He would hate it and cry.’  
 Կ'ատէր ու կու լար:
- c. g-ɑ'd-e-ø-r=mə / g-ɑ'd-e-ji-n=mə  
 IND-hate-TH-PST-3SG=Q / IND-hate-TH-PST-3PL=Q  
 ‘Would he/they hate it?’  
 Կ'ատէ՞ր մը: Կ'ատէ՞ին մը:
- d. g-ɑ'd-e-ø-r=gor / g-ɑ'd-e-ji-n=gor  
 IND-hate-TH-PST-3SG=PROG / IND-hate-TH-PST-3PL=PROG  
 ‘He was/They were hating it.’  
 Կ'ատէր կոր: Կ'ատէին կոր:

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- e. jet<sup>h</sup>e a'd-e-Ø-r=ne / a'd-e-ji-n=ne  
 if hate-TH-PST-3SG=SBJV / hate-TH-PST-3PL=SBJV  
 'If he/they would hate it.'  
 Եթէ աստէր նէ: Եթէ աստէին նէ:

### double check if khanjian had ne trigger stress shift

With two clitic clusters (38), we don't see stress shift for 'also' + Q, progressive + 'also', progressive + Q, and subjunctive + 'also'. The lack of stress shift is found both for the past imperfective and for elsewhere in the language §5.2.2

- (38) a. g-a'd-e-Ø-r=al=mə / g-a'd-e-ji-n=al=mə  
 IND-hate-TH-PST-3SG=also=Q / IND-hate-TH-PST-3PL=also=Q  
 'Would he/they also hate it?'  
 Կ'աստէ՞ր ալ մը: Կ'աստէ՞ին ալ մը:
- b. g-a'd-e-Ø-r=gor=al / g-a'd-e-ji-n=gor=al  
 IND-hate-TH-PST-3SG=PROG=also / IND-hate-TH-PST-3PL=PROG=also  
 'He was/They were also hating it.'  
 Կ'աստէր կոր ալ: Կ'աստէին կոր ալ:
- c. g-a'd-e-Ø-r=gor=mə / g-a'd-e-ji-n=gor=mə  
 IND-hate-TH-PST-3SG=PROG=Q / IND-hate-TH-PST-3PL=PROG=Q  
 'Was he/Were they also hating it?'  
 Կ'աստէ՞ր կոր մը: Կ'աստէ՞ին կոր մը:
- d. jet<sup>h</sup>e a'd-e-Ø-r=ne=al / a'd-e-ji-n=ne=al  
 if hate-TH-PST-3SG=SBJV=also / hate-TH-PST-3PL=SBJV=also  
 'If he/they would also hate it.'  
 Եթէ աստէր նէ ալ: Եթէ աստէին նէ ալ:

For the progressive + subjunctive cluster (39), stress shifts to the progressive. Secondary stress is perceived on the theme vowel. The subjunctive particle is special in being able to shift stress. Note the presence of the indicative prefix, whose meaning is overridden by the subjunctive clitic.

- (39) jet<sup>h</sup>e g-ad-e-Ø-r='gor=ne /  
 if IND-hate-TH-PST-3SG=PROG=SBJV /  
 g-ad-e-ji-n='gor=ne  
 IND-hate-TH-PST-3PL=PROG=SBJV  
 'If he/they were hating it.'  
 Եթէ կ'աստէր/կ'աստէին կոր նէ:

## 5.5 Words with irregular stress

The previous sections looked at words which had irregular stress because of specific morphological factors. Specifically, these words had irregular stress because they contained a special type of derivational suffix, inflectional feature, or clitic. Their irregularity was thus systematic and consistent.

Alongside the above systematic types of irregular stress, there's also a handful of words which have irregular stress for purely arbitrary reasons, such as the monomorphemic word ['manavant<sup>h</sup>] 'especially'. These are irregular words include interrogative pronouns, common particles, and some common adverbs. There is no synchronic reason or rule behind why these words have irregular stress. Speakers simply have to memorize that these words have irregular stress.

We provide a list of such words in Table fill. These words are taken from diverse sources.

get words from sources:

- from wiktionary, just use wikipron to find stress and then check the sources
- Gharagulyan 1974:221: irregular stressed words list
- Irregular stress-ed function words (Vaux 1998:133, Syoukyasyan 2004:29, Margaryan 1997:75) with some variation (Margaryan 1997:76)
- **Emphatic adverbs:** Certain words always get or are adjacent to sentential stress (Աբեղյան 1933: 23). They sound as if they get narrow focus.
- (Abeghyan 1933:23 - Prosody) Միայն մինչեւ անգամ անգամ լոյսիսկ իսկ մանավանդ

For some of these words, there is likely a diachronic reason as to why the word has irregular stress. For example, some of the words above are morphologically compounds: ['nujn-bes] 'in the same way'. In an earlier stage of the language, they might've been two separate words that were often said together as part of some phrase or collocation: ['nujn + bes] 'same + way'. In their modern form, they act as one word but the irregular stress is a residue of this older syntactic structure.

Note also that there are some words that are recent borrowings from Romance, English, or Russian. These words generally keep their original stress location (Ղարազյույան 1974: 223). get examples from book

## 5.6 Secondary stress

Whereas Armenian has relatively clear rules for primary stress, secondary stress is quite unclear. We catalog the following types of secondary stress: alleged initial secondary stress, prefix-based secondary stress, length-induced secondary stress, and demoted secondary stress.

Initial secondary stress is often reported in grammars, but there's little to no phonological or phonetic evidence for it; it is likewise difficult to perceive at all. Prefix-based secondary stress is when stress is on special prefixes. Length-induced secondary stress is perceived prominences in substantially long words, such as long compounds. Demoted secondary stress is when secondary stress is on the final syllable or some other syllable which *should* have gotten primary stress, but then some other morpheme (like negation) got primary stress.

### 5.6.1 Alleged initial secondary stress

Most published grammars report that words have initial secondary stress on the first syllable (Table 5.37). This creates a hammock pattern because primary stress is on the final syllable (Gordon 2002). However, some of these grammars also report that initial secondary stress is very difficult to perceive (Աբեղյան 1933: 20).

Table 5.37: Alleged initial secondary stress

<sup>h</sup> ak <sup>h</sup>	‘city’	քաղաք
aha <sup>h</sup> na	‘priest’	քահանայ
badas <sup>h</sup> an	‘answer’	պատասխան
badas <sup>h</sup> an-a <sup>h</sup> vor	‘responsible’	պատասխանատու
badas <sup>h</sup> an-avor- <sup>h</sup> ner	‘responsible-PL’	պատասխանատուներ
badas <sup>h</sup> an-avor-ne <sup>h</sup> r-ov	‘responsible-PL-INS’	պատասխանատուներով

As a native-speaking phonologist of Armenian, HD could never hear initial secondary stress on non-prefixed words. HD suspects that reports of initial secondary stress are actually just epiphenomenal. Cross-linguistically, the word-initial syllable is important for psychological processing of words (Becker et al. 2012). The initial syllable can likewise affect the phonological form of later syllables, such as in terms of vowel harmony (Beckman 1997). For Armenian, we suspect that various grammarians impressionistically argue that there is initial secondary stress because the first syllable is psycholinguistically important.



For un-prefixed words, there is evidence that initial secondary stress is just an illusion, perhaps an illusion from phrasal prosody. The evidence is that there is widespread disagreement among grammarians on diverse issues (Fairbanks 1948, Johnson 1954, Ղարազյուլյան 1974, Մարգարյան 1997, Սուքիասյան 2004, Թոխմախյան 1971, 1975, 1983). For example, there's disagreement on whether i) secondary stress can only appear in large words, ii) it can appear on the second syllable instead of the first, and iii) it can appear on schwas. However, these reports are largely impressionistic, with little known acoustic support.

In terms of word size and schwas (Table 5.38), Fairbanks (1948: 12) reports secondary stress only appear on the first syllable in 3-syllable and 5-syllable words, even if the syllable has a schwa. For 4-syllable words, he documents secondary stress on the first syllable if it has a full vowel, otherwise on the second syllable if the first has a schwa. Kassabian (1971) agrees with his reports. We convert his data to IPA and to our segmentation for inflection.<sup>9</sup>

Table 5.38: Alleged secondary stress in Fairbanks (1948)'s Western data

3 and 5 syllable words		4 syllable words	
ənda'nik <sup>h</sup>	'family'	ən,dani'k <sup>h</sup> -i-n	'family-GEN-DEF'
desa'ran	ընտանիք 'view'	sagargu't <sup>h</sup> jyn	ընտանիքին 'bargaining'
are'vod	սոսարան 'sunny'	jegeʁe'tsi	սակարկութիւն 'church'
hedak <sup>h</sup> ər <sup>h</sup> ra'gan	արեւոտ 'interesting'	k <sup>h</sup> ə,rase'ran	եկեղեցի 'writing desk'
medzamasnu't <sup>h</sup> jyn	հետաքրքրական 'majority'	χə,more'ben	գրասեղան 'pastry'
	մեծամասնութիւն	zovatsu'tsitʃ	խմորեղէն 'refreshing'
			զովացուցիչ
make sure had all the words			

But in contrast, Johnson (1954: 11,18) documents secondary only on words with at least 4 syllables in her Eastern Armenian consultants (Table 5.39). She reports that secondary stress falls on the first syllable, even if it has a schwa. She reports that schwas with secondary stress are slightly lengthened and backed (Johnson

<sup>9</sup>Fairbanks translated the word [k<sup>h</sup>əraseʁan] as 'typewriter', but a more accurate translation is 'writing desk'.

1954: 18).<sup>10</sup>

Table 5.39: Alleged secondary stress in Johnson (1954)’s Eastern data

‘majr amu’sin	‘mother ‘husband’	մայր ամուսին
,amusin-’ner	‘husband-PL’	ամուսիններ
,amusin-ne’r-i	‘husband-PL-GEN’	ամուսինների
,usumnasira’kan	‘lovers of education’ <b>check</b>	ուսումնասիրական
,usumnasirakan-ne’r-i	‘lover of education (-PL-GEN)’	ուսումնասիրականների
tʰəʃnami-’ner	‘enemy-PL’	թշնամիներ
<b>make sure had all the words</b>		

**get stress data from other grammars**

Throughout this grammar we do not annotate alleged initial secondary stress simply because we can’t even hear it. There is no phonological process that references alleged initial secondary stress. The closest example of such a phonological process is how syncope is blocked in word-initial secondary stress, but as discussed in **cite chapter on syncope**, syncope can just reference word-medial syllables. The second closest example is how stressed prefixes can block some allophonic rules. But these cases belong to prefix-based secondary stress, not alleged initial secondary stress.

**5.6.2 Prefix-based secondary stress**

Prefix-based secondary stress is when there is secondary stress on some special morpheme. These special morphemes are the negative prefix *an-* (§5.6.2.1) and reduplication prefixes (§5.6.2.2). Secondary stress on these morphemes is significantly more perceivable than alleged secondary stress. For example, HD can hear prefix-based secondary stress, while he cannot hear alleged initial secondary stress.

**5.6.2.1 Negative prefix**

For the negative prefix *an-*, this prefix is added to nouns and adjectives (X) to create a new word that can mean ‘not X’ or ‘without X’ (Table 5.40). This prefix is analogous to the English prefix *un-* and the English suffix *-less*. Secondary

<sup>10</sup>Johnson transcribes underlying /nn/ sequences as [n] via a rule of degemination in her consultant. We don’t transcribe this degemination.

stress is on this prefix Թոխսխիյան 1975: 179. Secondary stress on this prefix can affect other segmental rules like nasal place assimilation (§3.4).

Table 5.40: Secondary stress on the negative prefix *an-*

'χid	'dense'	խիտ	,an-χid	'scarce'	անխիտ
'dzuχ	'smoke'	ծուխ	,an-dzuχ	'smokeless'	անծուխ
t <sup>h</sup> e't <sup>h</sup> ev	'light'	դեղեւ	,an-t <sup>h</sup> et <sup>h</sup> ev	'firm'	անդեղեւ
le'zu	'tongue'	լեզու	,an-le'zu	'tongue-less'	անլեզու
hadʒe'li	'pleasant'	հաճելի	,an-hadʒe'li	'unpleasant'	անհաճելի
zama'nag	'time'	Ժամանակ	,an-zama'zu	'inopportune'	անԺամանակ

Ղարազյույան (1974: 133) reports that the secondary stress of this prefix is not weak. In my intuition, the perceptibility of this prefix's stress is clear and robust. To illustrate, the following bisyllabic words act as near-minimal pairs (Table 5.41). The initial syllable sounds more stressed when that syllable is the negative prefix.

Table 5.41: Near-minimal pairs for secondary stress of the negative prefix *an-*

,an-t <sup>h</sup> as	'irregular'	անդաս	t <sup>h</sup> as	'class'	դաս
an-t <sup>h</sup> am	'member'	անդամ			
,an-daf	'rough'	անտաշ	da'f-e-l	'to chip'	տաշել
an'dar	'forest'	անտառ			
,aŋ-gaχ	'independent'	անկախ	'gaχ	'hung up'	կախ
aŋk <sup>h</sup> am	'time'	անգամ			

### 5.6.2.2 Secondary stress in reduplication

Reduplication is when part of a word is repeated to add an additional meaning. Reduplication creates secondary stress. The relevant reduplicative processes include root reduplication, emphatic reduplication, and word reduplication.

For root reduplication (Table 5.42), but there are words which are made up of a reduplicated or repeated root. The root is monosyllabic. Many of these words are verbs. In such words, primary stress is on the final syllable. The first syllable (the first copy of the root) has a perceptible secondary stress. The second syllable can either have the original non-schwa vowel, or a reduced schwa.

## 5 Suprasegmental phonology of word stress

Table 5.42: Initial secondary stress in root reduplication with the gloss ‘√-√-TH-INF’

ˌkʰɑj-kʰɑj-e-l	‘to dissolve’	քայքայել
ˌvɑʁ-vɑʁ-e-l	‘to hurry’	վաղվաղել
ˌtʃɑr-tʃɑr-e-l	‘to torture’	չարչարել
ˌvɑz-vɑz-e-l	‘to run around’	վազվազել
ˌdʒɑm-dʒɑm-e-l	‘to chew’	ծամծամել
ˌpʰɑl-pʰɑl-i-l	‘to sparkle’	փալփալիլ

Such reduplication can likewise place secondary stress on an initial schwa (Table 5.43).

Table 5.43: Initial secondary stress on schwas in root reduplication with the gloss ‘√-√-TH-INF’

ˌvəz-vəz-ɑ-l	‘to buzz’	վզվզալ
ˌχəl-χəl-e-l	‘to neglect’	խլխլել
ˌgəm-gəm-ɑ-l	‘to lisp’	կմկմալ
ˌdʒər-dʒər-ɑ-l	‘to creak’	ճռճռալ
ˌtʰər-tʰər-e-l	‘to fly about’	թռթռել
ˌfər-fər-e-l	‘to rustle’	ֆրֆրել

The morphology of this reduplication process is discussed more in **reduplication prefix chapter**. It is a type of derivational morphology that is used to derive new words, often with an intensity meaning.

For emphatic reduplication (Table 5.44), a small number of adjectives have a derived intensive form. In this form, the first CV-sequence of the root is repeated, and either *pʰ* or *s* is added as a coda. Secondary stress is perceivable on this repeated syllable. Note how voicing assimilation can apply across the prefix-root boundary.

Table 5.44: Secondary stress in emphatic reduplication

maˈkʰur	‘clean’	մաքոր	ˌmas-maˈkʰur	‘very clean’	մաս-մաքոր
ˈsev	‘black’	սե	ˌsep-ˈsev	‘very black’	սեփ-սե
tʰeˈɪn	‘yellow’	դեղին	ˌtʰep-tʰeˈɪn	‘very black’	դեփ-դեղին
garˈmir	‘red’	կարմիր	ˌgas-ˈkarmir	‘very red’	կաս-կարմիր

For word reduplication, monosyllabic or bisyllabic adjectives/nouns can be repeated to create an adverbial meaning. When these words are reduplicated, both

the first and second word have final stress. For Eastern Armenian, Մարգարյան (1997: 76) reports that the second word takes primary stress, while the first takes secondary stress. If each word is monosyllabic, he reports that the first word lacks any stress.

In contrast to those Eastern judgments (Table 5.45), HD reports that in his Western Armenian, the first word takes primary stress, while the second word takes secondary stress. The Eastern judgments below are from (Մարգարյան 1997: 76).

Table 5.45: Secondary stress in adverb-forming word reduplication

Unreduplicated		Reduplicated adverb		
		Eastern	Western	
ɑ'ɾak <sup>h</sup>	'fast'	ɑ,ɾag-ɑ'ɾag	ɑ'ɾak <sup>h</sup> -ɑ,ɾak <sup>h</sup>	արագ արագ
he'ru	'far'	he,ru-he'ru	he'ru-he,ru	հեռու հեռու
si'run	'pretty'	si,run-si'run	si'run-si,run	սիրուն սիրուն
ga'mats	'slow'	ka,mats <sup>h</sup> -ka'mats <sup>h</sup>	ga'mats-ga,mats	կամաց կամաց
jer'gu	'two'	jer,ku-jerku	jer'gu-jer,gu	երկու երկու
ga'bujd	'blue'	ka,pujt-ka'pujt	ga'bujd-ga,bujd	կապոյտ կապոյտ
'nor	'new'	nor-'nor	'nor-,nor	նոր նոր
'sud	'lie/false'	sut-'sut	'sud-,sud	սուտ սուտ
'meg	'one'	mek-'mek	'meg-,meg	մէկ մէկ
'k <sup>h</sup> itʃ	'few'	k <sup>h</sup> itʃ <sup>h</sup> -k <sup>h</sup> itʃ <sup>h</sup>	'k <sup>h</sup> itʃ-,k <sup>h</sup> itʃ	քիչ քիչ

Prosodically, each copy of the word is likely its own prosodic word. HD reports that allophonic processes like voicing assimilation don't need to apply across the reduplication boundary. Although we're not sure, it is possible that some assimilation happens in fast speech.

### 5.6.3 Demoted primary stress

The last type of perceivable secondary stress is from demoted primary stress. As a general rule, the rightmost non-schwa vowel in the word gets primary stress. But in certain morphological constructions, primary stress is irregularly on some other element. When this irregularity happens, the syllable that previously had final primary stress now has final secondary stress.

One such example (Table 5.46) involves imperatives and negative imperatives (prohibitives). For all verbs, the imperative 2SG takes regular final stress. The prohibitive is formed by placing the particle *mi* before the verb. This particle takes primary stress. The verb's final syllable takes secondary stress.

Table 5.46: Demoted primary stress as secondary stress in prohibitives

Infinitive	ɑ'd-e-l	√-TH-INF	'to hate'	ատել
Imperative 2SG	ɑ'd-e	√-TH	'hate!'	ատէ
Prohibitive 2SG	'mi ɑ,d-e-r	√-TH-2SG	'Don't hate!'	մի ատեր

When forming the prohibitive, the final primary stress of the verb is demoted to secondary stress. As surveyed in §5.4, stress-attracting morphemes take primary stress, while the phonology places secondary stress on the final syllable.

#### 5.6.4 Length-induced secondary stress in compounds and prefixoids

Because Armenian has agglutinative morphology, it is quite easy to coin words with five or more syllables. This is quite common when creating compounds (§5.6.4.1) or words with prefixoids (§5.6.4.2). Because of how long these words are, some previous grammars report secondary stress on these words. We're not sure if what they report as secondary stress is genuine phonological prominence, vs. some type of rhythm-effect of putting small pauses in large words.

##### 5.6.4.1 Long compounds

Compounds are formed by concatenating stems with the linking vowel *-a-*. Some compounds idiosyncratically lack this vowel. Primary stress falls on the right-most full vowel of the compound (40).

- (40) a. 'don + 'd̥zar                      'holiday + tree'                      տօն, ծառ  
           don-a-'d̥zar                      'Christmas tree'                      տօնածառ  
       b. 'χat̪ + 'k<sup>h</sup>ar                      'cross + stone'                      խաչ, քար  
           χat̪-'kar                      'cross-stone'                      խաչքար

Compounds form a single prosodic word, as signalled by how they take final stress. However, it's unclear if there is any secondary stress inside a compound. Based on past grammars and our own impression, there is some degree of secondary stress for substantially long compounds.

For substantially long compounds (Table 5.47), Մարգարյան (1997: 76) reports that there is secondary stress on the linking vowel. Սուքիասյան (2004: 30) reports secondary stress on the first syllable and *only* for compounds with at least 3 syllables. More indeterminacy is documented elsewhere (Թոխմախյան 1971: 63; Ղարազյուլյան 1974: 22; Թոխմախյան 1983: 74). All of this work focuses on Eastern Armenian.

Table 5.47: Secondary stress in large compounds

	Morphemes	Source
E gi t-a-hetazot-a'kan	'research'	Մարգարյան 1997: 76
W k <sup>h</sup> i d-a-hedazod-a'gan	√-LV-√-NMLZ	գիտահետազոտական
E o,t <sup>h</sup> -a-naf-ka'jan	'airplane station'	Մարգարյան 1997: 76
W o,t <sup>h</sup> -a-nav-ga'jan	√-LV-√-√	օդանավայան
E gə,r-a-k <sup>h</sup> ənn-a-'dat	'literary critic'	Մարգարյան 1997: 76
W k <sup>h</sup> ə,r-a-k <sup>h</sup> ənn-a-'tad	√-LV-√-LV-√	օդաքննադատ
E aj,s-u-he'tev	'henceforth'	Մարգարյան 1997: 76
W aj,s-u-he'dev	√-LV-√	այսուհետեւ
E ajn-ù-amenaj'niv	'nevertheless'	Մարգարյան 1997: 76
W ajn-ù-amenaj'niv	√-LV-√	այնուամենայնիւ
E man,r-a-masn-o'ren	'detailed'	Մարգարյան 1997: 76
W man,r-a-'masn-oren	√-LV-√	մանրամասնօրէն
E usum,n-a-dastijarak-ts <sup>h</sup> -a'kan	'educational'	Մարգարյան 1993: 14
W usum,n-a-t <sup>h</sup> astijarak-ts-a'gan	√-LV-√-NMLZ-ADJZ	ուսումնադաստիարակցական
E dʒerm-a-elekt-r-a-kent'ron	'thermal power center'	Սուքիասյան 2004: 29
W tʃerm-a-elekt-r-a-gend'ron	√-LV-√-LV-√	ջերմաէլեկտրակէնտրոն
E ,ultr-a-manufak-a-'gujn	'ultra-violet-colored'	Սուքիասյան 2004: 29
W ,ultr-a-manufag-a-'k <sup>h</sup> ujn	√-LV-√-LV-√	ուլտրամանուշակագոյն
E ,hets-anv-a-vas-k <sup>h</sup>	'bicycle-ride'	Սուքիասյան 2004: 29
W ,hedz-anv-a-vas-k <sup>h</sup>	√-√-LV-√-NMLZ	հեծանուավազք
E ,huf-a-kərts <sup>h</sup> -k <sup>h</sup> -a-na'fan	'commemorative badge'	Սուքիասյան 2004: 29
W ,huf-a-gərts-k-a-na'fan	√-LV-√-NMLZ-LV-√	յուշակրօքանշան

For the above words, the reported secondary stresses are from the Eastern Armenian. The Western Armenian forms are from HD. We suspect that the above secondary stresses aren't genuine types of prosodic prominences. Instead, we highly suspect that these 'stresses' are caused by optional small pauses between the roots in these very large compounds.

#### 5.6.4.2 Prefixoids or compound-like prefixes

Armenian does have some other derivational prefixes. These prefixes are considered 'learned' prefixes because they're most often used to create words that are high-register, technical, or calques. These prefixes have very similar structure to compounds. They surface with the same linking vowel *-a-* that's used in compounds. These prefixes occupy a grey area between simple prefixes vs. compounds. So we call them prefixoids.

Սուքիասյան (2004: 29) reports secondary stress on the initial syllable of these prefixoids in Eastern Armenian (Table 5.48). We think Western Armenian like-

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wise has secondary stress on these prefixes. We adapt his data to Western Armenian. Ղարազյույան (1974: 222) reports more cases of prefixoids taking secondary stress.

Table 5.48: Secondary stress on learned prefixes (adapted from Eastern from Սուքիասյան 2004: 29)

ˌver-jergər-ˈja	<i>up</i> -√world-ADJZ	‘above ground’	վերերկրյա
ˌver-amparts	<i>up</i> -√lift-ADJZ	‘lift’	վերաժբարձ
ˌhag-a-garavar-aˈgan	<i>anti</i> -LV-√govern-ADJZ	‘anti-governmental’	հակակառավարական
kʰer-hokʰn-adz-uˈtʰjɛn	<i>supra</i> -LV-√tire-RPTCP-NMLZ	‘over-tiredness’	գերյօզնածուլթիւն
ˌmag-əntʰats-uˈtʰun	‘tide’	<i>sub</i> -√course-NMLZ	‘tide’

## 5.7 Orthographic encoding of stress

This chapter went over the location of primary and secondary stress in words. The location was determined based just on the perception of stress by native and non-native speakers of Armenian. Interestingly, the Armenian orthography provides independent evidence for the location of stress. This comes from infixal punctuation symbols.

As surveyed in §2.3, some punctuation symbols are placed inside the word on the stressed syllable. For example in questions, the question marker ‘<’> is placed on the vowel which carries the strongest stress in the sentence. In a simple yes-no question or polar question, this stress is on the verb (41a). If some other constituent is the strongest word (=is questioned), then the symbol is on that word (41b). In this section, we place the ‘<’> symbol on the stressed vowel in both the transcription and transliteration lines

- (41) a. iren      deˈs-ɑˈr  
him.DAT see-PST-2SG  
‘Did you see him?’  
իրեն տեսա՞ր:  
<iren desaˈr.>
- b. iˈreˈn      des-ɑ-r  
him.DAT see-PST-2SG  
‘Did you see HIM? (and not someone else)’  
իրե՞ն տեսար:  
<iˈreˈn desar.>

As we shall see, native speaker-authors of Armenian can detect the location of primary stress in words, and then encode this knowledge in the orthography.



This primary stress can be regularly or irregularly derived. For the rest of this section, we illustrate with example sentences from the Western Armenian translation of the Bible.<sup>11</sup> We're not sure when is the exact age of this translation, but some online sources suggest it's from the 19th century.<sup>12</sup> English translations are taken from the New International Version.

First, as stated, regular primary stress is on the rightmost non-schwa vowel of the word. In the examples below, stress is the plural suffix *-ner*. The orthography places the question symbol on it. In (42a), this suffix is final and takes stress. In (42b), this suffix is before a schwa and takes stress.

- (42) a. amɛŋk<sup>h</sup>-ət<sup>h</sup> al hazarabed-**ne**<sup>ʔ</sup>r bidi ən-e-Ø  
 all-poss.2SG also chiliarch-PL and centurion-PL FUT do-TH-3SG  
 '... Will he make all of you commanders of thousands and  
 commanders of hundreds?' (1 Samuel 22:7)  
 Literally: 'Will he make all of you chiliarchs and centurions?'  
 ... ամէնքդ ալ հազարապետներ ու հարիւրապետներ պիտի ընէ,  
 <amɛn<sup>ʔ</sup>k<sup>ʔ</sup> t al hazarabedner ow hariwrabed**ne**<sup>ʔ</sup>r bidi ənɛ,>
- b. gam t<sup>h</sup>e jerginj<sup>h</sup>-**ne**<sup>ʔ</sup>r-ə gu-d-a-n antsev-ə  
 or that sky-PL-DEF IND-give-TH-3PL rain-DEF  
 '... Do the skies themselves send down showers?' (Jeremiah 14:22)  
 Literally: 'Or that the skies give rain?'  
 Կամ թէ երկինքները կու տան անձրեւը:  
 <Gam t<sup>ʔ</sup>ɛ ergink<sup>ʔ</sup> **ne**<sup>ʔ</sup>r ə gow dan antsevə.>

Thus phonological primary stress is easily reflected in the orthography. For negation-induced irregular primary stress, the orthography likewise marks this. Recall from §5.4.1 that in the negative indicative, the non-finite verb takes secondary stress while a negated auxiliary takes primary stress. This rule is reflected in the orthography. In 43a, the negated auxiliary is spelled as a separate word, takes stress, and takes the question marker. In 43b, the negated auxiliary is procliticized into the vowel-initial verb. Stress is on the initial vowel.

- (43) a. gə-gardz-e-s t<sup>h</sup>e tʃ-**e**<sup>ʔ</sup>-m gərn-a-r hima im  
 IND-think-TH-2SG that NEG-is-1SG can-TH-CN now my.GEN  
 hor-əs aɣatʃ-e-l  
 father.OBL-POSS.1SG beseech-TH-INF  
 'Do you think I cannot call on my Father,' (Matthew 26:53)

<sup>11</sup><https://hycatholic.ru/biblia/>  
<https://wol.jw.org/hyw/wol/binav/r487/lp-r/sbil>

<sup>12</sup><http://armenianbible.org/>

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Կը կարծես թէ չմ'ի կրնար հիմա իմ Զօրս աղաչել, Literally: ‘Do you think that I cannot now beseech my father?’

<Gə gardzes t'ë tʃ'e'm grnar hima im hōrs aʔatʃ'el,>

- b. u anor ah-ə tser vərə tʃ-i'jn-a-r  
and his.GEN dread-DEF your.GEN.PL on NEG-fall-TH-CN

‘Would not the dread of him fall on you?’ (Job 13:11)

Literally: ‘And doesn’t his dread fall on you?’

Ու անոր ահը ձեր վրայ չ'ի յնար:

<Ow anor ahə tser vraj tʃ'i'jnar.>

Although the orthography does encode irregular stress in the above cases, there are exceptions. For example in the past perfective, the negation prefix is added to the verb and attracts stress. If the root is vowel-initial, then the first vowel takes stress (44a). If the root is consonant-initial, then a schwa is epenthesized and this schwa takes stress (44b). In both cases, the verb-final syllable takes secondary stress. But in the orthography, the question marker is added to the verb-final syllable, and not the initial syllable.

- (44) a. jes tsesz dasnəjerguk<sup>h</sup>-ət<sup>h</sup> tʃ-əndr-e-ts-i'-Ø,  
I.NOM you.PL.ACC twelve-POSS.2SG NEG-choose-TH-AOR-PST-1SG  
‘Have I not chosen you, the Twelve?’ (John 6:70)  
Ես ձեզ տասներկուք չընտրեցի՞,  
<es tsez dasnergowk't' tʃ'əndrets'i',>
- b. jes kezi rak<sup>h</sup>el-i-n hamar tʃə-dzaraj-e-ts-i'-Ø  
I.NOM you.SG.DAT Rachel-DAT-DEF for NEG-serve-TH-AOR-PST-1SG  
‘I served you for Rachel, didn’t I?’ (Genesis 29:25)  
Literally: ‘Didn’t I serve you for Rachael?’ Ես քեզի Ռաքէլին համար չծառայեցի՞.  
<es kezi Ėak'ëlin hamar tʃ'dzarayets'i',>

We don’t know why the orthography doesn’t place the question marker on the first vowel of the past perfective. It’s possible that perhaps that when these orthographic rules were established for Armenian, primary stress was not on the first syllable in the past perfective.

Despite the exceptionality of punctuation with the past perfective, question punctuation is useful to find variation in the placement of irregular stress. For example, for the interrogative pronoun ‘how much’, stress is irregularly on the first syllable in general: [vortʃap<sup>h</sup>]. In the Bible, there were 6 instances of this word with a question marker on the first syllable (45a). However, there were 2

instances where the question marker was on the second syllable (45b), indicating that this word should be read with final stress in these sentences.

- (45) a. 'vo'rtʃap<sup>h</sup> e-n k<sup>h</sup>u dʒaraj-i-t<sup>h</sup> or-er-ə,  
 how.much is-3PL your.SG.GEN servant-GEN-POSS.2SG day-PL-DEF,  
 'How long must your servant wait?' (Psalm 119:84)  
 Literally: 'How many are the days of your servant?'  
 Ո՞րչափ են քու ծառայիդ օրերը,  
 <O'rtʃ'ap' en k'ow dʒarajit ōr-er-ə,>
- b. vor'tʃa'p<sup>h</sup> e-n im anorenut<sup>h</sup>jʏn-ner-əs u meχk-er-əs  
 how.much is-3PL my.GEN iniquity-PL-POSS.1SG and sin-PL-POSS.1SG  
 'How many wrongs and sins have I committed?' (Job 13:23)  
 Literally: 'How many are my iniquities and sins?'  
 Որչափ են իմ անօրէնութիւններս ու մեղքերս:  
 <Or'tʃ'a'p' en im anōrēnowt'iwnners ow meyk'ers.>

We don't know why there is the above variation. It could be that the use of final stress was judged as more stylistically or rhythmically 'nicer' for the translator who was translating the verse in (45b). To HD's ears, the use of final stress in (45b) sounds very emphatic and poetic.

Besides stylistic variation, the question marker can likewise indicate possible language change. For the past imperfective, early grammars imply that this inflection had regular final stress. But the modern Lebanese community has irregular theme vowel stress. In the Bible, we find the question mark on the final syllable, indicating that the final syllable was stressed for the translator.

- (46) art<sup>h</sup>jok<sup>h</sup> menk<sup>h</sup> gər'n-α-ji'-ŋk<sup>h</sup> k<sup>h</sup>id-n-α-l t<sup>h</sup>e aniga bidi  
 perhaps we.NOM can-TH-PST-1PL know-INCH-TH-INF that that FUT  
 əs-e-Ø  
 say-TH-3SG  
 'How were we to know he would say...?' (Genesis 43:7)  
 Literally: 'Perhaps we could have known that he will say...?'  
 արդեօք մենք կրնայի՞նք գիտնալ թէ անիկա պիտի ըսէ...  
 <arteōk' menk' grnayi'nk' kidnal t'e aniga bidi əse...>

Thus, written corpora can be quite useful for finding diachronic and synchronic variation in stress.

## 5.8 Phonetics of stress and feet

This chapter focuses on the phonology of stress assignment. For the phonetics, there's very little information on the acoustic cues or effects of either primary or secondary stress. For an overview of the latest work on Armenian stress, see [Seyfarth et al. \(review\)](#).

For Eastern Armenian, there are some phonetic studies of stress from Soviet Armenia ([Խաչատրյան 1988](#), [Թոխմախյան 1983](#)). But these studies have various methodological issues that makes it difficult to accurately interpret their stress results. Some modern studies exist ([Haghverdi 2016](#)).

For Western Armenian, there are some studies ([Gordon et al. 2012](#), [Athanasopoulou et al. 2017](#)). These studies suggest that main acoustic cue for stress is just pitch or f0. Other factors like duration don't significantly mark stress.

Besides phonetics, there is little to no phonological evidence for the metrical foot in Armenian ([DeLisi 2015](#): 42ff, [2018](#): 115). It's possible that because pitch is the main cue for stress, that stress does not utilize feet ([Özçelik 2019](#)).

add phonetics

## 6 Prosodic phonology and intonation

pics, check out lena borise work

This chapter looks at the phonology of phrases and sentences. As descriptive tools, we use basic tree structures from prosodic phonology (Selkirk 1986, Nespor & Vogel 1986) and basic autosegmental-metrical ToBI annotation (Pierrehumbert 1980, Ladd 2008, Jun 2005).

For prosodic phonology, the main idea is when syntactic structures (words, phrases, clauses) are pronounced, their pronunciation forms specific groupings called prosodic constituents. Such constituents are demarcated by various prosodic or intonational cues like stress, pause, final duration, and pitch. For example, a sentence like (1a) is made up of four words, which are each pronounced as a separate prosodic word (with stress). The two syntactic phrases form two prosodic phrases  $\phi$ , each with phrasal stress (bold). The sentence is one intonational phrase and the most prominent word (underlined) carries nuclear stress. The sentence ends in a falling pitch  $\searrow$ .

- (1) a. (Adj N) $\phi$  (N O) $\phi$   $\searrow$   
gar'mir ga'du-n **ba'nir** ge'r-a-v  $\searrow$   
red cat-DEF cheese eat.AOR-PST-3SG  
'The red cat ate cheese.'  
Կարմիր կատուն պանիր կերաւ:

In the above sentence, there is a clear isomorphism or match between the syntactic structure and the prosodic/phonological structure. But mismatches can occur in special circumstances. The formation of prosodic words was discussed in more depth in §5.1.4 in the context of lexical stress. But some words like the copula =e 'is' (2) are clitics because the syntax treats them as words, but the phonology treats them similarly to unstressed suffixes. As detailed in §6.1, such clitics are pronounced with the preceding word into a single larger prosodic word as demonstrated by their unambiguous resyllabification: [u'ra.xe].<sup>1</sup>

<sup>1</sup>Soviet Armenian literature generally doesn't designate any special category of clitics. Some grammars even seem to treat particles, pronouns, and clitics as being prosodic words (Սոփաբախյան 2004: 25). re-read to check wich clitics he means

- (2) (N)<sub>ϕ</sub> (Adj Cop)<sub>ϕ</sub> ↘  
ga'du-n u'raχ =e ↘  
cat-DEF happy =is  
'The cat is happy.'  
Կատուն ուրախ է:

For clitics, resyllabification is quite unambiguous. In contrast, it seems there's no resyllabification across lexical words like [ga.dun.u.ra...] from (2). Section §6.2 goes over the resyllabification, with caveats on contradictory evidence.

Moving to larger structures, Section §6.3 discusses the formation of prosodic phrases from syntactic phrases. Usually an entire syntactic phrase forms a single prosodic phrase, but sometimes a large syntactic phrase is broken up into smaller prosodic phrases. An interesting phenomenon is the location of phrasal stress in prosodic phrases (cf. 1a). Noun phrases and adpositional phrases have phrasal stress on their last word (the noun or postposition), while verb phrases have stress on the preverbal word. Complications arise when verb phrases and noun phrases are combined together.

The remaining sections look at the phonology of sentences. Section §6.4 looks at the assignment of nuclear stress in typical broad-focus sentences. These are sentences where no individual word is more semantically important than the other. Briefly, nuclear stress is on the last prosodic phrase of the sentence. The last prosodic phrase is typically the verb phrase, and then nuclear stress is on the preverbal word. This word is often a direct object or indirect object.

Section §6.5 looks at the intonational of sentences. We look at declaratives, interrogatives, sentences with focused words, and negation. The different syntactic structures utilize different locations of nuclear stress, post-focal deaccenting, and different distributions of sentence-final pitches.

Section §6.6 looks at other types of sentences that don't easily fit into the previous classification. Such sentences are subjunctive clauses, relative clauses with extraposition, imperatives, and vocatives. Each type of syntax has its own special phonological rules.

## 6.1 Clitics and particles

There are many morphemes that can be (lazily) categorized as particles, as an umbrella term for anything that's not a noun, verb, adjective, adverb, or pronoun. These particles are rather small in size (one syllable), and usually unstressed. Some of these can be easily classified as phonological clitics (§6.1.1), while some

seem to not be clitics (§6.1.2); another set of words seem to have been clitics in an earlier stage of the language but are no longer clitics now (§6.1.3). The stress behavior of such clitics was described earlier in §5.2. This section focuses on the more general prosodic structure of clitics. Note that we use underlining in this section for illustration/contrast, and not to mark nuclear stress.

**TODO:** Lists of such unstressable clitics can be found in Մարգարյան (1997: 78) and Khanjian (2013: 72).

### 6.1.1 Particles that are clitics

Armenian has a small set of clitics. Cross-linguistically, a clitic is a word that displays paradoxical behavior between the morphosyntax and the phonology (Inkelas 1989, Anderson 2005). For the morphosyntax, a clitic is word-like in that it has some level of meaning that is word-like. But for the phonology, a clitic is suffix-like because it is pronounced as part of a larger word-like unit with an adjacent word.

For example, when the English verb ‘is’ is pronounced as [ɪz] and written as ‘is’, then the verb acts as a non-clitic word. But when the verb is contracted as ‘s’ [z], then the verb is now a clitic. The morphosyntax treats the verb as a word in both cases, but the phonology treats ‘is’ as a suffix-like element when contracted.

For Armenian, a small set of words are unambiguously treated as clitics. These elements or words are clitics because the morphosyntax treats them as having enough semantic content. They are spelled as separate words with a space, and speakers simply ‘feel’ that these are words. But the phonology treats them as suffix-like. The phonological properties are summarized in Table 6.1.

Table 6.1: Phonological properties of clitics

	Copula [e] է	‘also’ [ɑl] ալ	‘and’ [u] ու	Q [mə] մը	Prog. [gor] կոր	Subj. [ne] նէ
Unstressed?	✓	✓	✓	✓	✓	✓
Resyllabified?	✓	✓	✓/X			
Affects the definite?	✓	✓	✓/X			
Can devoice?				✓		
Can be initial?	X	X	✓	X	X	X

Note that copula can range from being just a single vowel as in the present 3SG [e], to having a coda [en] (present 3PL) or being bisyllabic [ejin] (past 3PL). All

these inflected forms of the copula behave the same and are clitics. See **auxiliary chapter** for full paradigms of the copula/auxiliary.

The first property is stress. In a typical situation, these elements are not stressed. They lean onto the preceding word which has stress. We show only one example here with the progressive [gor] (3a), but we went through the stress properties of each of the above morphemes in §5.2.1. Note that in some clitic combinations, we can get stress on one of the clitics (3b) (§5.2.2.2). Stress is in bold. We underline the relevant clitic.

- (3) a. ցə-lə's-e-n =gor  
 IND-listen-TH-3PL =PROG  
 'They are listening.'  
 Կը լսեն կոր:
- b. jet<sup>h</sup>e ցə-ləs-e-n ='gor =ne  
 if IND-listen-TH-3PL =PROG =SBJV  
 'If they are listening.'  
 Եթէ կը լսեն կոր նէ:

The second property is resyllabification. If clitic is vowel-initial, then it is syllabified with the preceding word. If the preceding word ends in a consonant (4a), then this consonant is pronounced as an onset.<sup>2</sup> If the preceding word ends in a vowel like [t<sup>h</sup>azə] 'fresh' or [axi] 'salty', then we get glide epenthesis (4b); see more in §4.7.6).

- (4) a. mart<sup>h</sup>-ə u'raχ =e, p<sup>h</sup>ajts də'χur =al =e  
 [mar.t<sup>h</sup>ə u.'ra. χe, p<sup>h</sup>ajts. də.'χu. ra. le]  
 man-DEF happy =is, but sad =also =is  
 'The man is happy, but he is also sad.'  
 Մարդը ուրախ է, բայց տխուր ալ է:
- b. biber-ə t<sup>h</sup>aza =je, p<sup>h</sup>ajts a'xi =jal =e  
 [bi.be.rə t<sup>h</sup>a.'za. je, p<sup>h</sup>ajts. a.'xi. ja .le]  
 man-DEF happy =is, but sad =also =is  
 'The pepper is fresh, but it is also salty.'  
 Պիպերը թազա է, բայց աղի ալ է:

<sup>2</sup>In a clitic cluster however like in [də'χur =al =e] 'he is also sad', it is possible that the clitic consonant is ambisyllabic: [də.'χu.ral.le].



The exception is the word ‘and’, which can syllabify either with the preceding word (5a) or on its own (5b). In the latter case, the word is no longer acting as a clitic.

- (5) a. **mart**<sup>h</sup> =u gin, də'**χa** =ju aχtʃig  
 ['**mar**. t<sup>h</sup>u. gin, də.'**χa**. ju. aχ.tʃig]
- b. **mart**<sup>h</sup> =u gin, də'**χa** =u aχtʃig  
 ['**mart**<sup>h</sup>. u. gin, də.'**χa**. u. aχ.tʃig]  
 man and woman, boy and girl  
 ‘man and woman, boy and girl’  
 մարդ ու կին, տղայ ու աղջիկ

The third property on definite allomorphy correlates with resyllabification. The definite suffix is *-n* after vowels, and *-n* after consonants (6a). But between a C-final word and V-initial clitic, the suffix is *-n* instead of *-ə* (6b, 6c). See **definite allomorphy chapter**.

- (6) a. ga'du-**n** jev 'mug-ə  
 [ga.dun. jev. mu.gə]  
 cat-DEF and mouse-DEF  
 ‘the cat and the mouse’  
 կատուն և մուկը
- b. asiga 'mug-n =e  
 [a.si.ga. 'mug. ne]  
 this mouse-DEF =is  
 ‘This is the mouse.’  
 Ասիկա մուկն է:
- c. 'mug-n =a des-a-Ø  
 ['mug. na de.sa]  
 mouse-DEF =also see-PST-1SG  
 ‘I also saw the mouse.’  
 Մուկն ալ տեսայ:

The conjunction [u] is variably a clitic, as shown by how it can either syllabify with the preceding word (7a) or not (7b). When syllabified, it affects the definite suffix.

- (7) a. 'mug-n =u gadu-n  
 ['mug. nu. ga.dun]  
 mouse-DEF and cat-DEF  
 'the cat and the mouse'  
 մուկն ու կատուն
- b. 'mug-ə =u gadu-n  
 ['mu.gə. u. ga.dun]  
 mouse-DEF and cat-DEF  
 'the cat and the mouse'  
 մուկը ու կատուն

The fourth property is devoicing. The only relevant clitic is the progressive [gor] because it starts with an obstruent (8a). This obstruent can optionally devoice after a voiceless obstruent (8b); suffixes seem to always devoice however (§3.3.7.1). We're not sure how often the clitic devoices though.

- (8) a. gə-lə's-e-s =gor  
 IND-listen-TH-2SG =PROG
- b. gə-lə's-e-s =kor  
 IND-listen-TH-2SG =PROG  
 'You are listening.'  
 Կը լսես կոր:

The fifth final property is being able to stand alone. In general, these clitics cannot start a sentence. They are always pronounced after some word. The preceding word and the clitic are pronounced together. The exception is the word 'and' [u] (9) which can start its own sentence or its own phrase after a pause. In this case, it is no longer acting as a clitic.

- (9) u jerrort<sup>h</sup> k<sup>h</sup>ed-i-n anun-ə digris e  
and third river-GEN-DEF name-DEF Tigris is  
 Genesis 2:14 – 'The name of the third river is the Tigris' (NIV)  
 Literally: 'And the name of the third river is Tigris.'  
 Ու երրորդ գետին անունը Տիգրիս է.

Structurally, we treat clitics as somehow incorporating into the prosodic word of the preceding word (Representation 4). A suffix like ablative -e takes stress and forms the last syllable of a prosodic word. In contrast, an unstressed clitic =e is adjoined to the preceding word. The adjunction structure is arguably either

a clitic group (CG: (Nespor & Vogel 1986, Vogel 2009) or a recursive prosodic word (Itô 1989, Selkirk 1996, Booij 1996). Both options have been proposed in the literature **cite vaux dolatian macak maybe khanjian**

Representation 4. Prosodic structure of suffixes vs. clitics

IPA: Gloss: Translation: Orthography:	suffix bani'r-e cheese-ABL 'From cheese.' Պանիրէ:	clitic ba'n che 'It is Պաւ
Structure	<div>PWord σ σ σ       ba ni 're</div>	<div>PW σ   ba</div>

On a last note, we briefly mention the indefinite morpheme [-mə] (10). This morpheme has been called a clitic in the past because a) it is unstressed, b) it is spelled with a space **cite sigler**. But, its phonological behavior can also be explained if we treat this morpheme as a suffix. HD’s speaker intuition is that this morpheme is more likely analyzable as just a suffix with a schwa.

- (10) Clitic: 'mart<sup>h</sup>=mə  
Suffix: mart<sup>h</sup>-mə  
man-INDF  
'a man'  
մարդ մը

6.1.2 Particles that don’t seem to be clitics

The previous section looked at morphemes that seem always be clitics (like the copula) or which by default act like clitics (the conjunction [u]). There are however some consonant-initial morphemes which seem to not be clitics, but we’re unsure.

There are some particles that are monosyllabic and unstressed (11). Because they are consonant-initial, they cannot syllabify with the preceding word. But, they don’t seem to lean onto the preceding word (11a-i). And they can be as starting their sentence or phrase (11a-ii), with an optional pause.

- (11) a. Complementizer [vor] ‘that’
- i. kʰid-e-m vor dəχa-n urax e  
know-TH-1SG that boy-DEF happy is  
‘I know that the boy is happy.’  
Գիտեմ որ տղան ուրախ է:
- ii. intʃ g-uz-e-m, vor urax əll-a-m  
what IND-want-TH-1SG, that happy be-TH-1SG  
‘What do I want? To be happy.’  
Ի՞նչ կ’ուզեմ: Որ ուրախ ըլլամ:
- b. Conjunction [gam] ‘or’
- i. tʃur gam tʰej  
water or tea  
‘water or tea’  
Զուր կամ թէյ:
- ii. gam tʃur, gam tʰej  
or water or tea  
‘Either water or tea.’  
Կամ ջուր կամ թէյ:

Other such particles of Armenian are listed in [chapter for particle lists](#).

It's not clear to us what phonological evidence can be used to treat the above morphemes as either always clitics, sometimes clitics, or never clitics.

### 6.1.3 Particles that used to be clitics

write with those stuff like i-ver from the grammars, to show how theyre no longer clitics

## 6.2 Resyllabification across words

Within a word, a consonant-vowel sequence is always syllabified as part of the same syllable. Their syllabification is likewise perceptually unambiguous. Similar unambiguity is found when a word-final consonant is syllabified with a following clitic. But across words, HD does not perceive resyllabification, but we're not sure what acoustic evidence is being used to create this perception.

First consider suffixes and clitics. The segment [e] is either the stressed ablative suffix *-e* (12a), or an unstressed copula clitic *=e* (12b). After a C-final word, both

types of [e] take an onset. The forms are homophonous except for a difference in stress.

- (12) a.  $\text{ʃu}^{\text{'}}\text{n-e}$   
            $[\text{ʃu}^{\text{'}}\text{.ne}]$   
           dog-ABL  
           ‘from a dog’  
            $\text{ʒnɪl}^{\text{t}}$   
           < $\text{ʃown}\bar{\text{e}}$ >
- b.  $\text{ʃun} = \text{e}$   
            $[\text{ʃu}^{\text{'}}\text{. ne}]$   
           dog =is  
           ‘It is a dog.’  
            $\text{ʒnɪl}^{\text{t}}$   
           < $\text{ʃown } \bar{\text{e}}$ >

In contrast, across words, our intuition is that there is no resyllabification, but we cannot find significant acoustic evidence against resyllabification. There likewise seems to be correlations with focus and stress. Note that after this point, we systematically use underlining for nuclear stress, and boldface for phrasal stress.

Consider the following two-word sentences. Nuclear stress is on the first word. The consonant in the [isu] sequence is either morphologically part of the first word /is#u/ (13a), morphologically part of the second word /i#su/ (13b).

- (13) a. **mis**  $\text{u}^{\text{'}}\text{n-e-}\emptyset\text{-r}$   
           meat have-TH-PST-3SG  
           ‘He had meat.’  
            $\text{ʃh u nɪl}^{\text{t}}\text{r}$
- b. **mi**  $\text{su}^{\text{'}}\text{l-e-r}$   
           PROH whistle-TH-2SG  
           ‘Don’t whistle!’  
            $\text{ʃh u nɪl}^{\text{t}}\text{r}$

There are two pieces of evidence against resyllabification (holistic perception and articulation), and two pieces of evidence for resyllabification (no length differences and non-holistic perception).

For holistic perception, when these sentences are uttered as a whole, HD perceives that the /s/ in (13a) is a coda, while the /s/ in (13b) is an onset. In terms of

articulation, he likewise ‘feels’ that the /s/ in /is#u/ is being articulated at the same time as /i/; while the /s/ in /i#su/ is not articulated at the same time as /i/.

However, when we examine the sound wave, we don’t see a significant difference in the length of either the first vowel /i/ or the consonant /s/. Furthermore, when only the substring [isu] is played back to HD, he cannot hear the difference between /i#su/ and /is#u/.

Given this contradictory evidence, it’s unclear if there is genuine phonetic resyllabification across words. If it exists, then perhaps HD’s holistic perception data is because he is psychologically perceiving the word-initial boundary of the second word, thus creating the illusion of no resyllabification. If resyllabification does not exist, then perhaps the relevant acoustic cues are too subtle to easily find without doing a large sample of data and with more refined measurements.

Similar contradiction is found for the sequence [ət<sup>h</sup>ə] below. Holistically, HD perceives no resyllabification. He feels that the /t<sup>h</sup>/ in /ət<sup>h</sup>#ə/ (14a) is articulated as a coda with a weaker release than the onset /t<sup>h</sup>/ in /ə#t<sup>h</sup>ə/ (14b). But then we find no acoustic length difference, and the substring is perceived as homophonous when the substring is played back.

- (14) a. k<sup>h</sup>irk<sup>h</sup>-ət<sup>h</sup>      əɾ-i-Ø  
           book-POSS.2SG do.AOR-PST-1SG  
           ‘I did your book.’  
           Գիրքդ ըրի:  
       b. k<sup>h</sup>irk<sup>h</sup>-ə    t<sup>h</sup>əɾ-i-Ø  
           book-DEF put.AOR-PST-1SG  
           ‘I put the book.’  
           Գիրքը դրի:

For the two-words sentences above, stress was on the first word. When stress is on the second word, there is clearer evidence against resyllabification.

Consider the [əsʊ] sequence below where focus on the second word. When /s/ is part of the unfocused first word /əs#u/ (15a), it is perceived as a coda, not loud, and there is a slight glottal stop after it. In contrast, when /s/ is part of the focused second word /ə#su/ (15b), the /s/ is an onset, louder (higher amplitude), and there’s no glottal stop.

- (15) a. dɑ<sup>h</sup>nɑg-əs      ur=e  
           knife-POSS.1SG where=is  
           ‘Where is my knife?’  
           Դանալկս ո՞ր է:

- b. dɑ'nɑg-ə 'sur=e  
 knife-DEF sharp=is  
 'Is the knife sharp?  
 Դանակը սրո՞ր է:

Similarly for [ə<sup>h</sup>ə], when the /t<sup>h</sup>/ is part of the first unfocused word (16a), the aspiration is quite short and there's again a slight glottal stop. But when /t<sup>h</sup>/ is part of the second focused word (16b), the /t<sup>h</sup>/ is an onset with a longer aspiration and no glottal stop.

- (16) a. k<sup>h</sup>irk<sup>h</sup>-ət<sup>h</sup> 'ər-i-Ø  
 book-POSS.2SG do.AOR-PST-1SG  
 'I DID your book.'  
 Գիրքդ ըրի՞:  
 b. k<sup>h</sup>irk<sup>h</sup>-ə t<sup>h</sup>ər-i-Ø  
 book-DEF put.AOR-PST-1SG  
 'I PUT the book.'  
 Գիրքը դրի՞:

Given all this evidence, it seems that when given a C-V sequence across two words, if Word2 is focused, then there is unambiguously no resyllabification. But if Word2 is not focused, holistic perception and articulation suggests there is no resyllabification, but we haven't been able to find concrete acoustic evidence.

Further, there is also morphological evidence against resyllabification. As explained earlier in (§6.1.1), the definite suffix is -ə after consonants (17a), but -n between a C-final word and V-initial clitic (17b). V-initial clitics trigger the -n form and this -n is the onset of the clitic. But when this suffix precedes a V-initial word, the definite suffix doesn't change from -ə to -n (17c).

- (17) a. 'mug-ə  
 ['mu.gə]  
 mouse-DEF  
 'the mouse'  
 մուկը  
 b. 'mug-n =al  
 ['mug. nal]  
 mouse-DEF =also  
 'also the mouse'  
 մուկն ալ

- c. 'mug-ə      ar-i-n  
 ['mu.gə.      a.ri]  
 mouse-DEF take.AOR-PST-3PL  
 'They took the mouse.'  
 Մուկը առին:

The allomorphy thus suggests that words generally don't syllabify with the preceding word. Diachronically and cross-dialectally however, the definite suffix can be sensitive to the subsequent word. But this is not the case for the typical Western Armenian sentence. See [cite definite allomorphy chapter](#)

### 6.3 Prosodic phrases and phrasal stress

Having established the formation of prosodic words, this section looks at the formation of prosodic phrases. In general, a syntactic phrase is changed into a prosodic phrase. Within a phrase, one element is perceived as more prominent than the others. This element is said to have phrasal stress. The word stress of other words in the phrase are said to have been demoted, such as via stress clash resolutions (Աբեղյան 1933: 28; Fairbanks 1948: 24-7; [vaux](#)). This section focuses more on the following questions:

- Is the prosodic phrase always the same size as the original syntactic phrase?
- Where is the location of phrasal stress?

For the first question, it seems that syntactic phrases are almost always mapped to single prosodic phrases, with minor complications in long noun phrases (§6.3.1 and in long verb phrases (§6.3.3.3, §6.3.4).

For the second question, noun phrases assign stress on the last word (§6.3.1). The same is for adpositional phrases (§6.3.2). Such prosodic phrases are thus right-headed. In contrast, verb phrases in an SOV sentence assign phrasal stress on the preverbal word, usually the object (§6.3.3). Such non-final placement may be due to recursive prosodic phrasing. The interaction between noun-phrase final-stress and verb-phrase pre-final stress is quite complex (§6.3.4). Some other types of syntactic phrases have their own unique stress rules (§6.3.5: adverbs (§6.3.5.1), compound-like collocations (§6.3.5.2), and reduplication (§6.3.5.3).

Note that throughout this section, we generally only mark phrasal stress (bold-face), and not nuclear stress. This is most of the examples in this section are fragments and not complete sentences. Furthermore, marking nuclear stress in this section would be redundant because the last prosodic phrase has nuclear stress.



## 6.3.1 Phrasal stress in noun phrases

For a noun phrase, the most typical pronunciation is to turn a noun phrase (NP) into a single prosodic phrase. The most perceptually prominent syllable is on the stressed syllable of the last word in the phrase (Աբեղյան 1933: 24-5). This means that phrasal stress is on the final prosodic word of the prosodic phrase. Thus prosodic phrases are right-headed. Long noun phrases with multiple nouns can however be broken up in speech.

First consider the basic order of the noun phrase. Left to right, we can have a genitive possessive pronoun, demonstrative, a numeral, an adjective, and then the noun. Other permutations of the possessive pronoun and demonstrative are possible, usually with a sense of emphasis on the demonstrative. The noun can end in either final lexical stress (18a) or penultimate lexical stress (18b). Each non-pronominal word has some perceptible word stress (=lexical stress), but the final noun has the strongest stress in bold. We use parentheses  $()_\phi$  to mark the edges of the prosodic phrase

- (18) a. (Poss Dem Num Adj N) $_\phi$   
 im 'ajs jer'gu ga'bujd dup<sup>h</sup>-e'f-e-n  
 I.GEN this two blue box-PL-ABL-DEF  
 'from my two blue boxes'  
 իմ այս երկու կապոյտ տուփերէն
- b. (Poss Dem Num Adj N) $_\phi$   
 mer 'ajt 'hiŋk<sup>h</sup> ga'nantʃ du'p<sup>h</sup>-e'f-ə  
 we.GEN that five green box-PL-DEF  
 'our five green boxes'  
 մեր այդ հինգ կանանց տուփերը

The above noun phrase is obviously rather long. In HD's impression, the default pronunciation is to make this noun phrase be a single prosodic phrase without a phrase-internal pause. But one can also add a brief pause in the middle of the noun phrase (19), so that we get two prosodic phrases of almost equal length. Both phrases have phrasal stress on the last word.

- (19) (Poss Dem Num) $_\phi$  (Adj N) $_\phi$   
 im 'ajs jer'gu $_\phi$  (ga'bujd dup<sup>h</sup>-e'f-e-n)  
 I.GEN this two blue box-PL-ABL-DEF  
 'from my two blue boxes'  
 իմ այս երկու կապոյտ տուփերէն

We similar prosodic phrasings for smaller noun phrases. For two-word phrases (6.2), we get a single prosodic phrase with stress on the final noun. The type of pre-nominal modifier does not matter.

Table 6.2: Right-headed prosodic phrasing of two-word noun phrases

(Adj N) <sub>φ</sub>	(Num N) <sub>φ</sub>	(Dem N) <sub>φ</sub>	(Poss N) <sub>φ</sub>
ɑɾ'dod dob'rag dirty bag 'dirty bag' աղտոտ տոպրակ	je'rek <sup>h</sup> mur'dʒ-er three hammer-PL 'three hammers' երեք մորճ	as 'mart <sup>h</sup> -ə this man-DEF 'this man' աս մարդը	(i'rents ga'du-n) they.GEN cat-DEF 'their cat' իրենց կատուն

A pre-nominal modifier can also be a quantifier (20). In general, quantifiers are treated like normal modifiers; the noun gets phrasal stress.

- (20) a. (Quant N)<sub>φ</sub>  
ɑ'men ɑr'du)  
every morning  
'every morning'  
ամէն առտու
- b. (Quant Adj N)<sub>φ</sub>  
p<sup>h</sup>o'lor hi'vant<sup>h</sup> ɑfagerd-'ner-ə  
all sick student-PL-DEF  
'all the sick students'  
բոլոր հիւանդ աշակերտները

However, quantifiers can easily attract stress to themselves because, pragmatically, quantifiers introduce nuanced contextual information, such as the need to emphasize a certain number. Stress on the quantifier (21) is however perceived more as sentential-stress (focus) rather than phrasal-stress

- (21) (Quant N)<sub>φ</sub>  
p<sup>h</sup>o'lor ɑfagerd-'ner-ə  
all student-PL-DEF  
'ALL the students'  
Բոլոր հիւանդ աշակերտները:

Within a noun phrase, the pre-nominal modifier can be another noun phrase, such as a genitive-marked possessor (22a). Both the possessor noun and the head noun can have their own other modifiers (22b,22c).

- (22) a. (N-Gen        N)<sub>φ</sub>  
           go'v-i-n        ag'ra-n  
           COW-GEN-DEF tooth-DEF  
           'the cow's tooth'  
           կովին ական
- b. (N-Gen        Adj    N)<sub>φ</sub>  
           go'v-i-n        χo'for ag'ra-n  
           COW-GEN-DEF huge tooth-DEF  
           'the cow's huge tooth'  
           կովին խոշոր ական
- c. (Adj        N-Gen        N)<sub>φ</sub>  
           dzer'mag go'v-i-n        ag'ra-n  
           white        COW-GEN-DEF tooth-DEF  
           'the white cow's tooth'  
           ճերմակ կովին ական

When the entire phrase is small (two or three words), HD feels that the entire noun phrase can be a single prosodic phrase. But when the noun phrase is large because both nouns have a modifier (23), then HD feels that it is more natural to break up the entire noun phrase into two prosodic phrases, one for each noun. Phrasal stress is on the nouns, and there can be a pause between the phrases.

- (23) (Adj        N-Gen)<sub>φ</sub>        (Adj    N)<sub>φ</sub>  
           (dzer'mag go'v-i-n)<sub>φ</sub>        (χo'for ag'ra-n)<sub>φ</sub>  
           white        COW-GEN-DEF huge tooth-DEF  
           'the white cow's huge tooth'  
           ճերմակ կովին խոշոր ական

For the above phrasing in (23), HD feels that two prosodic phrases are used but not because of phonological length, but because of semantic content. It is more accommodating for the speaker's and listener's perception to break this noun phrase into two phonological phrases, one per noun. The two nouns both have their own modifiers. By putting a pause between the noun phrases, it's easier for the speaker and hearer to mentally create an image of these two nouns and to then modify both. In contrast, if only one noun is modified, then it feels 'easier' for the speaker and listener to mentally entertain the image of both nouns.

Besides genitive possessors, a pre-nominal NP can also be an instrumental-marked noun phrase (24a). Such a phrase is translated to an English 'with X' construction. Like genitive possessors, an instrumental noun and the head noun are

by default phrased together (24a). Either of them can have their own modifiers (24c, 24c). But if both nouns have modifiers (24d), then the default pronunciation is to create two prosodic phrases, one per noun.

- (24) a. (N-Ins            N)<sub>φ</sub>  
           zəbi'd-ov        də'ʁɑ-n  
           smile-INS-DEF boy-DEF  
           'the boy with the smile'  
           ժպիտով տղան
- b. (N-Ins            Adj    N)<sub>φ</sub>  
           zəbi'd-ov        u'ɾɑχ    də'ʁɑ-n  
           smile-INS-DEF happy boy-DEF  
           'the happy boy with the smile'  
           ժպիտով ուրախ տղան
- c. (Adj    N-Ins            N)<sub>φ</sub>  
           gɑr'mir zəbi'd-ov        də'ʁɑ-n  
           red        smile-INS-DEF boy-DEF  
           'the boy with the red smile'  
           կարմիր ժպիտով տղան
- d. (Adj    N-Ins)<sub>φ</sub>            (Adj    N)<sub>φ</sub>  
           gɑr'mir zəbi'd-ov        u'ɾɑχ    də'ʁɑ-n  
           red        smile-INS-DEF happy boy-DEF  
           'the happy boy with the red smile'  
           կարմիր ժպիտով ուրախ տղան

In sum, noun phrases are most typically pronounced as a single prosodic phrase with stress on the final noun. Deviations exist in special circumstances (pre-nominal nouns, focus-sensitive quantifiers).

### 6.3.2 Phrasal stress in adpositional phrases

An adpositional phrase (AP) is a phrase made up of an adposition and a noun. The adposition can be a preposition or a postposition. There are significantly more postpositions in the language, rather than prepositions. Prepositions lack case-marking, while most postpositions act like their own nouns and take case-suffixes. In both types of adpositional phrases, we generally have final stress (Աբեղյան 1933: 26-7).

First consider postpositional phrases (25). The postposition selects a noun phrase; the noun phrase often bears some case suffix. That noun phrase can have

its own modifiers. The entire AP is a single prosodic phrase with stress on the final adposition.

- (25) a. (Adj N Post)<sub>φ</sub>  
 k<sup>h</sup>e'rug də'x-u-n k<sup>h</sup>o'v-e-n  
 chubby boy-GEN-DEF next-ABL-DEF  
 'from next to the chubby boy'  
 գէրուկ տղուն քովէն
- b. (Adj N Post)<sub>φ</sub>  
 k<sup>h</sup>e'rug də'x-u-n k<sup>h</sup>o'v-ə)  
 chubby boy-GEN-DEF next-DEF  
 'next to the chubby boy'  
 գէրուկ տղուն քովը

Although postpositions are function words, they are stressed because they're very noun-like. The morphosyntax places case-markers and other nominal inflectional suffixes for some but not all postpositions. The lexical phonology treats postpositions as simple prosodic words with their own lexical stress. Thus the phrasal phonology also treats postpositional phrases as noun phrases, with final stress.

There are dozens of postpositions in the language, and they all behave the same with regard to taking phrasal stress. Below, we go through some of the more common postpositions that can take inflectional suffixes.

- (26) (N Post)<sub>φ</sub>
- a. k<sup>h</sup>evor'k<sup>h</sup>-i-n 'mod  
 Kevork-GEN-DEF near  
 'near Kevork'  
 Գեորգիւն մօտ
- b. ʃak<sup>h</sup>a'r-e-n 'zad  
 sugar-ABL-DEF besides  
 'besides sugar'  
 շաքարէն զատ
- c. barde'z-e-n an't<sup>h</sup>in  
 garden-ABL-DEF beyond  
 'beyond the garden'  
 պարտէզէն անդին

- d.  $\text{fer}^h\text{'k}^h\text{-i-n}$        $\text{'t}^h\text{em-ə}$   
 building-GEN-DEF facing-DEF  
 ‘facing the building’  
 շէնքին դէմը
- e.  $\text{se}^h\text{a}^h\text{'n-i-n}$        $\text{da}^h\text{g-e-n}$   
 table-GEN-DEF under-ABL-DEF  
 ‘from under the table’  
 սեղանին տակէն

Although there are many postpositions, there are very few prepositions. None of them can take case suffixes. A typical prepositional phrase has final stress on the noun.

- (27) a. (Pre      Adj      N) $_{\phi}$   
 $\text{min}^h\text{t}^h\text{jev}$   $\text{ga}^h\text{'bujd}$   $\text{'bad-ə}$   
 until      blue      wall-DEF  
 ‘until the blue wall’  
 մինչեւ կապոյտ պատը
- b. (Pre      N-Gen      N) $_{\phi}$   
 $\text{t}^h\text{'e}^h\text{bi}$        $\text{ma}^h\text{ro}^h\text{'j-i-n}$        $\text{fu}^h\text{'ga-n}$   
 towards Maro-GEN-DEF store-DEF  
 ‘towards Maro’s store’  
 դէպի Մարոյին շուկան

For most prepositions like ‘until’ [ $\text{mint}^h\text{jev}$ ], the prepositional phrase takes final stress, on the noun. However, there are some prepositions like ‘without’ [ $\text{arants}^h$ ] that take stress.

- (28) a. (Pre      N) $_{\phi}$   
 $\text{a}^h\text{'rants}^h$   $\text{ba}^h\text{'nir}$   
 without cheese  
 ‘without cheese’  
 առանց պանիր

It seems that the preposition [ $\text{arants}^h$ ] ‘without’ is unique in being able to take stress, and it seems to require stress. The exceptionality of this preposition is likely because of semantics. Negation and negation-like meanings often cause special intonational or prosodic effects.

In sum, postpositional phrases place phrasal stress on the final postpositions. Most prepositional phrases place phrasal stress on the final noun.

### 6.3.3 Phrasal stress in verb phrases

Noun phrases (NPs) and adpositional phrases (APs) have phrasal stress on the final word. But in verb phrases (VPs), the verb is final but avoids stress. Instead, phrasal stress is on the pre-verbal item. We establish this generalization by going through simple cases of verb phrases with only two words (§6.3.3.1), verb phrases with clitics and periphrasis (§6.3.3.2), and recursively large verb phrases (§6.3.3.3). Note that the phrasal stress of verb phrases is closely tied with the nuclear stress of the sentence. The behavior of definite objects, ditransitives, and intransitives is discussed under nuclear stress in Section §6.4.

#### 6.3.3.1 Verb phrases with two words

Although Armenian is an SOV sentence, it is common to omit the subject, thus creating rather small sentences (29). We establish the basics of verb-phrase stress with these smaller examples. Briefly, verbs avoid stress; phrasal stress is on the preverbal word, usually the object.

- (29) a. (N            V)<sub>φ</sub>  
           aɣra-**'ner** u'n-i-∅  
           tooth-PL have-TH-3SG  
           ‘He has teeth.’  
           Ակռաներ ունի:
- b. (N            V)<sub>φ</sub>  
           aɣ'**ra**-mə u'n-i-∅  
           tooth-INDF have-TH-3SG  
           ‘He has a tooth.’  
           Ակռայ մը ունի:

To reduce clutter, this section only marks phrasal stresses (boldface). We don't mark nuclear stress, which is essentially the last phrasal stress of the sentence.

We know that phrasal stress is on the pre-verbal item because of two reasons. First, perceptually we can hear prominence on the pre-verbal item. Second, acoustically, the verb is deaccented or has lost its own lexical stress. Such deaccenting is called post-focal deaccenting or post-focal compression.

#### wav form

The preverbal item is usually a noun object, but it can range over other arguments or syntactic categories, such as locational nouns (30a), adjectives (30b), or adverbs (30c).

- (30) a. (Loc V)<sub>φ</sub>  
ameri'ga g-ab'r-i-n  
America IND-live-TH-3PL  
'They live in America.'  
Ամերիկա կ'ապրին:
- b. (Adj V)<sub>φ</sub>  
dzer'mag je'k-a-n  
white become.AOR-TH-3PL  
'They became white.'  
ճերմակ եղան:
- c. (Adv V)<sub>φ</sub>  
a'rak<sup>h</sup> g-e'p<sup>h</sup>-e-n  
fast IND-cook-TH-3PL  
'They cook (things) quickly.'  
Արագ կ'եփեն:

### 6.3.3.2 Verb phrases with clitics or periphrasis

Some verb tenses use an unstressed proclitic. If no object is present, then stress is on the verb (31a). If there is an object, then the object takes stress (31b).

- (31) a. (Pro V)<sub>φ</sub>  
bidi u'd-e-m  
FUT eat-TH-1SG  
'I will eat.'  
Պիտի ուտեմ:
- b. (N Pro V)<sub>φ</sub>  
ba'nir bidi u'd-e-m  
cheese FUT eat-TH-1SG  
'I will eat cheese.'  
Պապկիր պիտի ուտեմ:

Some verb tenses are periphrastic. The verb is a participle, while inflection is on an enclitic auxiliary. The verb takes stress when no object is present (32a). If an object is present, stress can shift to the object (32b). However, these tenses often easily allow stress on the verb (32c); the object is then deaccented as some type of given information. cite nakipoglu



- (32) a. (V            Aux)<sub>φ</sub>  
           ge'r-**adz** =e-m  
           eat-RPTCP =is-1SG  
           'I have eaten.'  
           Կերած եմ:
- b. (N    V            Aux)<sub>φ</sub>  
           ba'nir ge'r-**adz** =e-m  
           cheese FUT        eat-TH-1SG  
           'I have eaten cheese.'  
           Պանիր կերած եմ:
- c. (N)    (V            Aux)<sub>φ</sub>  
           ba'nir ge'r-**adz** =e-m  
           cheese FUT        eat-TH-1SG  
           'I have eaten cheese.'  
           Պանիր կերած եմ:

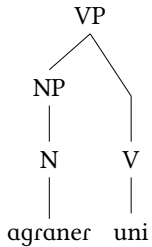
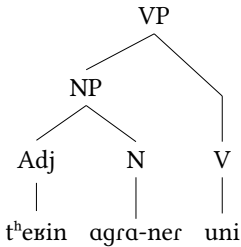
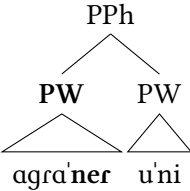
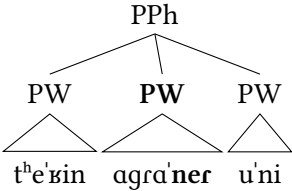
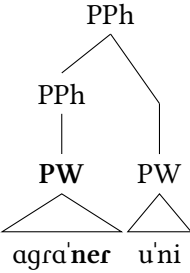
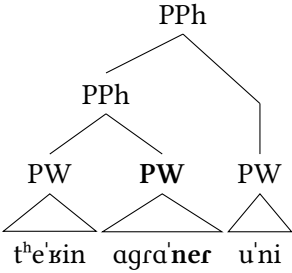
### 6.3.3.3 Recursive layering in verb phrases

It is rather paradoxical that when a noun phrase is pronounced, the phrasal stress is on the final element; whereas in a verb phrase, the phrasal stress is not on the final verb. We see this paradox clearly for larger verb phrases. The above verb phrases were all two-word phrases, but the pre-verbal argument can of course take modifiers (33). In such cases, phrasal stress stays on the pre-verbal item.

- (33) a. (Adj    N            V)<sub>φ</sub>  
           t<sup>h</sup>e'xin agrɑ-'**ner** u'n-i-∅  
           yellow tooth-PL have-TH-3SG  
           'He has yellow teeth.'  
           Դեղին ականեր ունի:
- b. (Adj    N            V)<sub>φ</sub>  
           t<sup>h</sup>e'xin ag'**ra**-mə u'n-i-∅  
           t<sup>h</sup>e'xin tooth-INDF have-TH-3SG  
           'He has a yellow tooth.'  
           Դեղին ական մը ունի:

Syntactically, the above sentences consist of a noun phrase object inside a verb phrase; we use relatively simple trees and glosses for illustration. Prosodically, it is tempting to argue that such a sentence consists of actually two recursive layers of prosodic phrases (PPh), as in Representation 5. One small prosodic phrase is created from the NP; this small prosodic phrase is contained in a larger prosodic phrase that is created from the VP. Note that PW is a prosodic word. The PW with phrasal stress is in bold.

**Representation 5.** Hypothetical flat vs. recursive prosodic structure in a verb phrase

	N + V (29a)	Adj + N + V (33a)
Syntax		
Flat prosody		
Recursive prosody		
	[agra'ner u'ni] teeth has 'He has teeth'	[tʰeʔin agra'ner u'ni] yellow teeth has 'He has yellow teeth'

Conceptually, the recursive structure is more appealing because it provides a more unified representation of prosodic phrases. If phrasal stress is present in a prosodic phrase, then it is always at the right edge of the phrase. But empirically, it is an open question if there is acoustic evidence for or against this recursive structure. The two structures are distinguished by the presence of a phrase right-boundary  $)_\phi$  between the noun and verb. Future acoustic evidence can be used to see if such a boundary truly exists.

The use of recursive structure is appealing for verb phrases, because here we see that phrasal stress is not at the right edge. Similar behavior is found with complex predicates that are made up of a word + a light verb like ‘to do’; these are also discussed in §6.4.2.

This preverbal item can be a meaningless word like [mədig]. This preverbal item gets stress if no object is present (34a). Adding an object shifts stress to the object (34b). This object can have its own modifiers, and again we see stress on the object (34c).

- (34) a. (X      V)<sub>φ</sub>  
           mə'dig g-ə'n-e-m  
           X          IND-do-TH-1SG  
           ‘I listen.’  
           Մտիկ կ'ընեմ:
- b. (N                      X      V)<sub>φ</sub>  
           jerk<sup>h</sup>-e'ru      mədig g-ə'n-e-m  
           song-PL-DAT X          IND-do-TH-1SG  
           ‘I listen to songs.’  
           Երգերու մտիկ կ'ընեմ:
- c. (Adj N                      X      V)<sub>φ</sub>  
           'hin jerk<sup>h</sup>-e'r-u      mədig g-ə'n-e-m  
           old song-PL-DAT X          IND-do-TH-1SG  
           ‘I listen to old songs.’  
           Հին երգերու մտիկ կ'ընեմ:

Note that in the rather large verb phrase in (34c), HD perceives some level of prominence on the preverb [mə'dig], but the stress on the object is still stronger.

As the size of the verb phrase goes from 2 to 4, we see that phrasal stress keeps shifting leftwards until it reaches the noun, and doesn't move further. Such iterative changes make sense if we again assumed that the syntax treated a complex predicate as some XP + V, and if the prosody created a recursive prosodic structure (Representation 6).

**Representation 6.** Hypothetical flat vs. recursive prosodic structure in a verb phrase with a complex predicate

## 6 Prosodic phonology and intonation

	X + V (34a)	N + X + V (34b)	Adj + N + X + V (34c)
Syntax	<pre> graph TD     VP --&gt; XP     VP --&gt; V[V]     XP --&gt; X[X]     XP --&gt; V2[V]     X --&gt; m[dig]     V --&gt; g[nem]           </pre>	<pre> graph TD     VP --&gt; XP     VP --&gt; V[V]     XP --&gt; NP[NP]     XP --&gt; V2[V]     NP --&gt; N[N]     NP --&gt; X[X]     N --&gt; j[er]     N --&gt; k[be]     N --&gt; r[ru]     X --&gt; m[dig]     V --&gt; g[nem]           </pre>	<pre> graph TD     VP --&gt; XP     VP --&gt; V[V]     XP --&gt; NP[NP]     XP --&gt; V2[V]     NP --&gt; Adj[Adj]     NP --&gt; N[N]     NP --&gt; X[X]     Adj --&gt; h[in]     N --&gt; j[er]     N --&gt; k[be]     N --&gt; r[ru]     X --&gt; m[dig]     V --&gt; g[nem]           </pre>
Flat prosody	<pre> graph TD     PPh --&gt; PW1[PW]     PPh --&gt; PW2[PW]     PW1 --&gt; m[dig]     PW2 --&gt; g[nem]           </pre>	<pre> graph TD     PPh --&gt; PW1[PW]     PPh --&gt; PW2[PW]     PPh --&gt; PW3[PW]     PW1 --&gt; j[er]     PW1 --&gt; k[be]     PW1 --&gt; r[ru]     PW2 --&gt; m[dig]     PW3 --&gt; g[nem]           </pre>	<pre> graph TD     PPh --&gt; PW1[PW]     PPh --&gt; PW2[PW]     PPh --&gt; PW3[PW]     PPh --&gt; PW4[PW]     PW1 --&gt; h[in]     PW2 --&gt; j[er]     PW2 --&gt; k[be]     PW2 --&gt; r[ru]     PW3 --&gt; m[dig]     PW4 --&gt; g[nem]           </pre>
Recur. pros.	<pre> graph TD     PPh --&gt; PPh1[PPh]     PPh --&gt; PW[PW]     PPh1 --&gt; PW1[PW]     PPh1 --&gt; PW2[PW]     PW1 --&gt; m[dig]     PW2 --&gt; g[nem]           </pre>	<pre> graph TD     PPh --&gt; PPh1[PPh]     PPh --&gt; PW[PW]     PPh1 --&gt; PPh2[PPh]     PPh1 --&gt; PW2[PW]     PPh2 --&gt; PW3[PW]     PPh2 --&gt; PW4[PW]     PW3 --&gt; j[er]     PW3 --&gt; k[be]     PW3 --&gt; r[ru]     PW4 --&gt; m[dig]     PW --&gt; g[nem]           </pre>	<pre> graph TD     PPh --&gt; PPh1[PPh]     PPh --&gt; PW[PW]     PPh1 --&gt; PPh2[PPh]     PPh1 --&gt; PW2[PW]     PPh2 --&gt; PW3[PW]     PPh2 --&gt; PW4[PW]     PW3 --&gt; h[in]     PW4 --&gt; j[er]     PW4 --&gt; k[be]     PW4 --&gt; r[ru]     PW2 --&gt; m[dig]     PW --&gt; g[nem]           </pre>
	[mə'dig gənem] X do 'I listen'	[jerk'be'ru mə'dig gənem] songs X do 'I listen to songs'	[hin jerk'be'ru mə'dig gənem] old songs X do 'I listen to old songs'

Similar evidence for recursive structuring is found in some periphrastic tenses. In some tenses, the verb is a participle, while inflection is on some light verb (35a). Some tenses combine proclitics, participles, and light verbs (35b). When no object is present, stress is on the first verb (the participle).

- (35) a. (V)<sub>φ</sub> (Comp V lightV)<sub>φ</sub>  
 g-u'z-e-m vor ge'r-**aďz** əl'l-a-m  
 IND-want<sub>TH</sub>-1SG that eat.AOR-RPTCP be-<sub>TH</sub>-1SG  
 'I want to have eaten.'  
 Կ'ուզեմ որ կերած ըլլամ:
- b. (Pro V lightV)<sub>φ</sub>  
 bidi ge'r-**aďz** əl'l-a-m  
 FUT eat.AOR-RPTCP be-<sub>TH</sub>-1SG  
 'I will have eaten.'  
 Դիտի կերած ըլլամ:

If an object is present, this object is usually in a separate prosodic phrase (36); the semantics of these complex tenses often imply that the object is some type of given information.

- (36) a. (V)<sub>φ</sub>                      Comp N)<sub>φ</sub>                      (V                      lightV)<sub>φ</sub>  
           g-u'z-e-m                      vor    bɑ'nir-ə                      ge'r-ɑdz                      ə'l-l-ɑ-m  
           IND-wantTH-1SG that    cheese-DEF eat.AOR-RPTCP be-TH-1SG  
           'I want to have eaten eaten.'  
           Կուզեմ որ պանիրը կերած ըլլամ:  
       b. (N)<sub>φ</sub>                      (Pro V                      lightV)<sub>φ</sub>  
           bɑ'nir-ə                      bidi ge'r-ɑdz                      ə'l-l-ɑ-m  
           cheese-DEF FUT eat.AOR-RPTCP be-TH-1SG  
           'I will have eaten the cheese.'  
           Պանիրը պիտի կերած ըլլամ:

The participle data would make sense if we treat the Verb-Verb sequences as a verb phrase inside a verb phrase. The variable deaccenting of the object is due to the pragmatics on how such complex tenses are used.

In sum, verb phrases place phrasal stress on the argument of the verb. This means that the prosodic phrase of a verb phrase does not have final stress; instead stress is on the preverbal item in most cases. Complex predicates can push this preverbal stress further leftwards. Such leftward shifting makes sense if we use recursive prosodic structures; but acoustic data is needed to verify such recursive structures. We stay agnostic for now.

#### 6.3.4 Phrasal stress when noun phrases and verb phrases combine

The previous sections established the prosodic phrase of a noun phrase is right-head (final stress), while the prosodic phrase of a verb phrase has stress on the non-final word. This section looks at how two types of phrases can be combined together. Different combinations cause different locations of phrasal stress. These combinations are subject-object clashes (§6.3.4.1), nominalized infinitives (§6.3.4.2), nominalized participles (§6.3.4.3), and combinations of infinitives with finite verbs (§6.3.4.4).

##### 6.3.4.1 Stress clash between subjects and objects

When a sentence has both a subject NP and a transitive verb phrase (37), the two phrases are each turned into their own prosodic phrase. The phrasal stress of the

verb phrase is perceived as the strongest stress of the sentence, i.e., as sentence stress or nuclear stress. Note that for simplicity, we use flat prosodic phrases for the verb phrases in this section.

- (37) a. (S)<sub>φ</sub> (N V)<sub>φ</sub>  
ga'du-n mu'g-er g-u'd-e-Ø  
cat-DEF mouse-PL IND-eat-TH-3SG  
'The cat eats mice.'  
Կատուն մուկեր կ'ուտէ:
- b. (Adj S)<sub>φ</sub> (N V)<sub>φ</sub>  
ano't<sup>h</sup>i ga'du-n mu'g-er g-u'd-e-Ø  
hungry cat-DEF mouse-PL IND-eat-TH-3SG  
'The hungry cat eats mice.'  
Անօթի կատուն մուկեր կ'ուտէ:

A slight pause is perceptible between the subject and the verb phrase. If the object has no modifier (37), then we see a stress clash between the subject and the object. If the object has a modifier (38), then there is no stress clash.

- (38) a. (S)<sub>φ</sub> (Adj N V)<sub>φ</sub>  
ga'du-n dʒer'mag mu'g-er g-u'd-e-Ø  
cat-DEF white mouse-PL IND-eat-TH-3SG  
'The cat eats white mice.'  
Կատուն ճերմակ մուկեր կ'ուտէ:
- b. (Adj S)<sub>φ</sub> (Adj N V)<sub>φ</sub>  
ano't<sup>h</sup>i ga'du-n dʒer'mag mu'g-er g-u'd-e-Ø  
hungry cat-DEF white mouse-PL IND-eat-TH-3SG  
'The hungry cat eats white mice.'  
Անօթի կատուն ճերմակ մուկեր կ'ուտէ:

#### 6.3.4.2 Noun-based vs. verb-based stress in infinitival phrases

Verb phrases avoid placing stress on the verb. The cases so far focused on finite verb phrases (39a), meaning verb phrases which had some subject agreement or tense marking. Armenian likewise allows a verb phrase to lack any inflection, such as an infinitival phrase (39b). Such infinitival phrases can be used as the complement of a verb like 'to like'. Such uses of infinitival phrases are analogous to English gerunds, as the translations show.

- (39) a. (N)<sub>φ</sub> (N V)<sub>φ</sub>  
 də'ʁa-k<sup>h</sup>-ə bə'nag gə-lə'v-a-n  
 boy-PL-DEF plate IND-wash-TH-3PL  
 'The boys wash dishes.'  
 Տղաքը բնակ կը լուան:
- b. (V)<sub>φ</sub> (N V-INF)<sub>φ</sub>  
 gə-si'r-e-m bə'nag lə'v-a-l  
 IND-like-TH-1SG plate wash-TH-INF  
 'I like washing dishes.'  
 Կը սիրեմ բնակ լուալ:

Note that when the infinitival phrase is selected by a verb like 'to like' (39b), the verb forms one prosodic phrase while the infinitival forms another.

Verb phrases and infinitival phrases have analogous prosodic phrases. Both place stress on the non-verbal element by default (39a). However, infinitives can take nominal inflection, such as the definite suffix (40a) or case suffixes (40b). When they do, the infinitival phrase acts like a noun phrase, and its prosodic phrase places stress on the inflected infinitive.

- (40) a. (N V-INF-Infl)<sub>φ</sub>  
 bə'nag lə'v-a-l-ə  
 plate wash-TH-INF-DEF  
 'the washing of plates'  
 բնակ լուալը
- b. (N V-INF-Infl)<sub>φ</sub>  
 bə'nag ləv-a-l-e-n  
 plate wash-TH-INF-ABL-DEF  
 'from the washing of plates'  
 բնակ լուալէն

Such inflected infinitival phrases are noun-like for both the prosody and the syntax. Such phrases can be used as subjects (41a) or other arguments/adjuncts (41b).

- (41) a. (N V-INF-Infl)<sub>φ</sub> (Adj V)<sub>φ</sub>  
 bə'nag lə'v-a-l-ə gare'vor =e  
 plate wash-TH-INF-DEF important =is  
 'Washing plates is important.'  
 Բնակ լուալը կարեւոր է:

- b. (N V-INF-Infl)<sub>φ</sub> (Adv V)<sub>φ</sub>  
 bə'nag ləv-a'l-e-n a'ra<sup>h</sup> gə-zəz'v-i-m  
 plate wash-TH-INF-ABL-DEF fast IND-sick.of-TH-1SG  
 'I quickly get sick of washing dishes.  
 Բնակ լուալէն արագ կը զգուիմ:

To summarize, when an infinitival phrase lacks any nominal inflection on the infinitive, then the phrase is pronounced as if it were a verb phrase. Phrasal stress is on the object, not the verb. But if the infinitival phrase gets nominal inflection on the infinitive, then the phonology treats this phrase like a noun phrase. Phrasal stress is on the verb.

#### 6.3.4.3 Variable retention of preverbal stress in participle clauses

Armenian syntax allows turning verb phrases into participle phrases, whether subject participles with *-oḅ* or resultative participles with *-adz*. Such participle phrases sometimes maintain the stress patterns of the original verb phrase, but not always.

Consider the finite verb phrase in (42a) where the verb has a stressed direct object. In (42b), the verb is turned into a subject participle with *-oḅ*, and the participle then acts as a pre-nominal modifier. The original subject becomes the head noun, while the participle acts like an adjective and does not get phrasal stress.

- (42) a. (S)<sub>φ</sub> (O V)<sub>φ</sub>  
 dʒa'ra-n bə'nag gə-mak<sup>h</sup>r-e-Ø  
 servant-DEF plate IND-clean-TH-3SG  
 'The servant washes plates.'  
 Ծառան պնակ կը մաքրէ:  
 b. (V-SPTCP N)<sub>φ</sub>  
 mak<sup>h</sup>r-oḅ dʒa'ra-n  
 clean-SPTCP servant-DEF  
 'The cleaning servant (the servant who cleans).'  
 մաքրող ծառան

If the participle retains its direct object (43), the direct object can optionally have its own phrasal stress too.

- (43) a. (N)<sub>φ</sub> (V-SPTCP N)<sub>φ</sub> plate clean-SPTCP servant-DEF  
 bə'nag mak<sup>h</sup>r-oḅ dʒa'ra-n



- b. (N V-SPTCP N)<sub>φ</sub>  
 bə'nag mak<sup>h</sup>r-ox dʒara-n  
 plate clean-SPTCP servant-DEF  
 'The plate-cleaning servant (the servant who cleans plates).'  
 պնակ մաքրող ծառան

If the head noun is deleted (44), then the participle carries nominal inflection such as the definite suffix. The entire construction is again treated as a noun phrase with final stress.

- (44) (N V-SPTCP-Infl)<sub>φ</sub>  
 bə'nag mak<sup>h</sup>r-ox-ə  
 plate clean-SPTCP-DEF  
 'The plate-cleaner (the person who cleans plates).'  
 պնակ մաքրողը

In contrast, the resultative participle uses the suffix *-adz* (45a). The original object becomes the head noun, while the original subject is a genitive possessor. The prosody of such constructions seems identical to normal noun phrases. If the genitive subject is unmodified (45a), then we have one prosodic phrase; else we have two phrases (45b).

- (45) a. (N-GEN V-RPTCP N)<sub>φ</sub>  
 dʒaraʃ-i-n mak<sup>h</sup>r-adz bə'nag-ə  
 servant-GEN-DEF clean-RPTCP plate-DEF  
 'the plate that the servant cleaned'  
 Literary: 'the servant's cleaned plate'  
 ծառային մաքրած պնակը
- b. (A N-GEN)<sub>φ</sub> (V-RPTCP N)<sub>φ</sub>  
 tʃə'xajn dʒaraʃ-i-n mak<sup>h</sup>r-adz bə'nag-ə  
 angry servant-GEN-DEF clean-RPTCP plate-DEF  
 'the plate that the angry servant cleaned'  
 Literary: 'the angry servant's cleaned plate'  
 զղայն ծառային մաքրած պնակը

The head noun can be deleted (46), with nominal inflection on the participle. The construction gets final stress again.

- (46) a. (N-GEN                      V-RPTCP-Inf)<sub>ϕ</sub>  
 dzarɑj-i-n                      mak<sup>h</sup>r-ɑdz-ə  
 servant-GEN-DEF clean-RPTCP-DEF  
 ‘the thing that the servant cleaned’  
 Literary: ‘the servant’s cleaned one’  
 ծառային մաքրածը
- b. (A                      N-GEN                      (V-RPTCP-Inf)<sub>ϕ</sub>)  
 tʃəʔɑjn dzarɑj-i-n                      mak<sup>h</sup>r-ɑdz-ə  
 angry servant-GEN-DEF clean-RPTCP-DEF  
 ‘the thing that the angry servant cleaned’  
 Literary: ‘the angry servant’s cleaned one’  
 ջղայն ծառային մաքրածը

It would be useful in the future to contrast the prosody of such structures against Turkish. Turkish likewise has participle clauses with subtle pronunciation rules **check** **gunes** **i** **think**.

#### 6.3.4.4 Stress on verbs in verb-verb sequences

Simple verb phrases are generally pronounced with stress on the preverbal object. But certain sentence structures can combine an infinitive with a finite verb (analytical causatives and control verbs). In these cases, this simple generalization breaks down and we see stress on the embedded verb.

Consider the basic transitive sentence in (47a) with one subject and one object. To create a causative meaning (47b), Armenian uses an analytical construction where the subject is turned dative, the verb is replaced by an infinitive, and then the verb ‘give’ is added.

- (47) a. (S)<sub>ϕ</sub>                      (O                      V)<sub>ϕ</sub>  
 marja-n    na'mag    gə-gar't<sup>h</sup>-ɑ-∅  
 Maria-DEF letter    IND-read-TH-3SG  
 ‘Maria reads letters.’  
 Մարիան նամակ կը կարդայ:
- b. (S)<sub>ϕ</sub>                      (IO)<sub>ϕ</sub>                      (O                      V-INF                      V)<sub>ϕ</sub>  
 ara-n    marja-'ji-n    na'mag    gar't<sup>h</sup>-ɑ-I    gu-'d-ɑ-∅  
 Ara-DEF Maria-DAT-DEF letter    read-TH-INF IND-give-TH-3SG  
 ‘Ara makes Maria read letters.’  
 Արան Մարիային նամակ կարդալ կու տայ:

The object + infinitive sequence acts as an argument of ‘give’. Thus the the OVV sequence is parsed (OVV) with stress on the embedded verb. One could hypothesize that such a sequence involves a recursive prosodic structure: ((OV)V). In HD’s judgment, if the object has more inflectional material, then it feels common to parse the object as a separate phrase (48).

- (48) a. (S)<sub>φ</sub> (IO)<sub>φ</sub> (O V-INF V)<sub>φ</sub>  
 ara-n marja-’ji-n namag-’ner gar’t<sup>h</sup>-a-l gu-’d-a-∅  
 Ara-DEF Maria-DAT-DEF letter-PL read-TH-INF IND-give-TH-3SG  
 b. (S)<sub>φ</sub> (IO)<sub>φ</sub> (O)<sub>φ</sub> (V-INF V)<sub>φ</sub>  
 ara-n marja-’ji-n namag-’ner gar’t<sup>h</sup>-a-l gu-’d-a-∅  
 Ara-DEF Maria-DAT-DEF letter-PL read-TH-INF IND-give-TH-3SG  
 ‘Ara makes Maria read letters.’  
 Արան Մարիային նամակներ կարդալ կու տայ:

Thus, causativization turns the prosody of embedded verb phrases into something similar to the prosody of noun phrases.

Similar transformations are found for sentences where a verb is a control verb like ‘want’ and it selects an infinitival phrase. The basic order is finite-object-infinitive (49a) with stress on the object. But other attested orders are object-finite-infinitive (49b) and object-infinitive-finite (49c). In these latter cases, stress is on the pre-finite word.

- (49) a. (V-fin)<sub>φ</sub> (O V-inf)<sub>φ</sub>  
 g-u’z-e-m na’mag gar’t<sup>h</sup>-a-l  
 IND-want-TH-1SG letter read-TH-INF  
 ‘I want to read letters.’  
 Կ’ուզեմ նամակ կարդալ:  
 b. (O V-fin V-inf)<sub>φ</sub> Նամակ կ’ուզեմ կարդալ:  
 na’mag g-u’z-e-m gar’t<sup>h</sup>-a-l  
 letter IND-want-TH-1SG read-TH-INF  
 c. (O V-inf V-fin)<sub>φ</sub> Նամակ կարդալ կ’ուզեմ:  
 na’mag gar’t<sup>h</sup>-a-l g-u’z-e-m  
 letter read-TH-INF IND-want-TH-1SG

### 6.3.5 Phrasal stress in other constructions

The previous section looked at the core types of syntactic phrases: noun phrases, adpositional phrases, verb phrases, and their combinations. This sections looks

at other types of syntactic phrases and their prosodic structure: adverbs (6.3.5.1), compound-like collocations (6.3.5.2), and reduplication (6.3.5.3). Such phrases don't fit neatly into the previous categories in terms of their syntax or stress.

### 6.3.5.1 Stress in adverbs

Adverbs can cause peculiar changes to prosodic phrases. It is rather difficult to make consistent generalizations on stress across all types of adverbs. Some adverbs induce their own special prosody because of their morphological or semantic properties.

Some adverbs are generally pronounced as separate prosodic phrases (50). Such adverbs include time adverbs whose meaning affects the general meaning of the verb.

- (50) a. (Adv)<sub>φ</sub> (V)<sub>φ</sub>  
 qj'sor k<sup>h</sup>ər-e-t̂s-i-Ø  
 today write-TH-AOR-PST-1SG  
 'Today, I wrote (stuff).'
- Այսօր գրեցի:
- b. (Adv)<sub>φ</sub> (O V)<sub>φ</sub>  
 qj'sor na'mag k<sup>h</sup>ər-e-t̂s-i-Ø  
 today letter write-TH-AOR-PST-1SG  
 'Today, I wrote letters.'
- Այսօր նամակ գրեցի:

Manner adverbs come in two basic morphological types: simplex and complex. Simplex manner adverbs are just a root (51). They generally are found preverbally, or before a bare object or locative. They attract phrasal stress away from the verb.

- (51) a. (Adv V)<sub>φ</sub>  
 ʔrak<sup>h</sup> je'g-a-Ø  
 quick come.AOR-PST-1SG  
 'I quickly came.'
- Արագ եկայ:
- b. (Adv Loc V)<sub>φ</sub>  
 ʔrak<sup>h</sup> 'dun je'g-a-Ø  
 quick home come.AOR-PST-1SG  
 'I quickly came home.'
- Արագ տուն եկայ:

- c. (Adv O V)<sub>φ</sub>  
 arak<sup>h</sup> k<sup>h</sup>irk<sup>h</sup> gə-gar<sup>t<sup>h</sup></sup>-a-m  
 quick book IND-read-TH-1SG  
 ‘I can quickly read books.’  
 Արագ գիրք կը կարդամ:

In contrast, morphologically complex adverbs are instead parsed as their own separate prosodic phrase (52).

- (52) a. (Adv)<sub>φ</sub> (V)<sub>φ</sub>  
 a'rak-oren k<sup>h</sup>ər-e-ts-i-Ø  
 quick-ADVZ write-TH-AOR-PST-1SG  
 ‘Quickly, I wrote (stuff).’  
 Արագօրէն գրեցի:
- b. (Adv)<sub>φ</sub> (O V)<sub>φ</sub>  
 a'rak-oren na'mag k<sup>h</sup>ər-e-ts-i-Ø  
 quick-ADVZ letter write-TH-AOR-PST-1SG  
 ‘Quickly, I wrote letters.’  
 Արագօրէն նամակ գրեցի:

Some adverbs like [ʃad] ‘many, very’ induce special emphatic stress and naturally attract stress (53). This adverb can attract stress away from nouns, adjectives, and verbs. The special prosody of [ʃad] is likely because of its special semantics.

- (53) Stress shift to the adverb [ʃad]
- a. From nouns
- i. (O V)<sub>φ</sub>  
 namag-**ner** u'n-i-m  
 letter-PL have-TH-1SG  
 ‘I have letters.’  
 Նամակներ ունիմ:
- ii. (Adv O V)<sub>φ</sub>  
**ʃad** namag-ner u'n-i-m  
 many letter-PL have-TH-1SG  
 ‘I have many letters.’  
 Շատ նամակներ ունիմ:
- b. From adjectives

- i. (Adj V)<sub>φ</sub>  
 'hin =e-n  
 old =is-3PL  
 'They are old.'  
 Զիկն են:
- ii. (Adv Adj V)<sub>φ</sub>  
 'jad 'hin =e-n  
 very old is-3PL  
 'They are very old.'  
 Շատ հիկն են:
- c. From verbs
  - i. (V)<sub>φ</sub>  
 gu-'l-a-m  
 IND-cry-TH-1SG  
 'I cry.'  
 Կու լամ:
  - ii. (Adv V)<sub>φ</sub>  
 'jad gu-'l-a-m  
 very IND-cry-TH-1SG  
 'I cry a lot.'  
 Շատ կու լամ:

#### 6.3.5.2 Compound-like phrases

This section discusses collocational compounds (54). What we call a collocational compound is when two words are said together as a type of phrase, usually a common saying. These phrases often have some sort of 'serial' meaning. Such phrases typically consist of two words with identical syntactic category, such as both being adjectives/adverbs. Each word has a perceivable stress (Ղարազյուլյան 1974: 222); the two stresses are equivalent in prominence. We suspect that each word is parsed as its own prosodic phrase.

- (54) (Adv)<sub>φ</sub> (Adv V)<sub>φ</sub>  
 jer'gar p<sup>h</sup>a'rag ցə-χo's-i-n  
 long thing IND-speak-TH-3PL  
 'They talk too much about nothing.'  
 Երկար-բարակ կը խօսին:

Such collocations can likewise be two verbs, whether as infinitives (55a) or finite verbs (55b).

- (55) a.  $\widehat{\text{tʃ-e-m}}$      $\text{si'r-e-r}$      $(\text{V})_\phi$   $\text{jert}^{\text{h}}\text{-a-l}$      $(\text{V})_\phi$   $\text{'k}^{\text{h}}\text{-a-l}$   
 NEG-is-1SG like-TH-CN go-TH-INF come-TH-INF  
 ‘I don’t like coming and going (= moving around).’  
 Չեմ սիրեր երթալ գալ:
- b.  $\text{a'men}$  ‘or  $\text{g-ert}^{\text{h}}\text{-a-n}$      $(\text{V})_\phi$   $\text{gu-'k}^{\text{h}}\text{-a-n}$   
 every day IND-go-TH-3PL IND-come-TH-3PL  
 ‘They’re coming and going (= visiting) every day.’  
 Ամէն օր կ’երթան կու գան:

### 6.3.5.3 Reduplication

Similar to collocations, echo reduplication creates two stress domains (56) (Մարգարյան 1997: 14). A word or phrase can be repeated, and the prefix *m-* replaces the word-initial onset of the second copy. Both copies have a perceivable primary stress; the two sound equivalent in prominence. We suspect that each copy is its own prosodic phrase.

- (56) a.  $(\text{Adj})_\phi$   $\text{haŋ'k}^{\text{h}}\text{ist}$      $(\text{Adj})_\phi$   $\text{maŋ'k}^{\text{h}}\text{ist}$      $\widehat{\text{tʃ-e-s}}$      $\text{ba'r-g-i-r}$     =gor  
 comfortable RED NEG-is-2SG sleep-TH-CN =PROG  
 ‘You are not sleeping comfortably or whatever.’  
 Հանգիստ մանգիստ չես պարկիր կոր:
- b.  $(\text{Adj})_\phi$   $\text{a't}^{\text{h}}\text{or}$      $(\text{Adj})_\phi$   $\text{ma't}^{\text{h}}\text{or}$      $\text{'betk}$      $\text{u'n-i-m}$   
 chair RED exist-TH-3SG need have-TH-1SG  
 ‘I need chairs and whatever.’  
 Աթոռ մաթոռ պէտք ունիմ:

## 6.4 Sentential stress in broad-focus contexts

The previous section cataloged phrasal stress: the strongest stress within a phrases Building off of Dolatian (2022). This section catalogs nuclear stress or sentential stress: the strongest stress within a sentence. We concentrate on broad-focus

contexts, meaning contexts where no single word is more semantically important than another.

This section catalogues the different types of sentences, and how nuclear stress is assigned. We go over complex predicates (§6.4.2), ditransitives (§6.4.4), and definite direct objects (§6.4.3). These are all unified in terms of how stress is on the last prosodic phrase. Typically the last phrase is the verb phrase, and nuclear stress is either on the verb or a preverbal item within the verb phrase. Variations are attested for other transitive orders like OVS (§6.4.5) and across classes of intransitives (§6.4.6).

### 6.4.1 Overview of nuclear stress

When describing nuclear stress, we must be careful with the semantics or information structure of the sentence. This section describes nuclear stress in broad-focus or all-focus contexts. This is a context where all the information in a sentence is new, and none is more semantically salient than another. Such contexts arise in out-of-the-blue contexts, such as in the following dialogue (57). Syllables with phrasal stress are in boldface; underlining is for the word with perceived nuclear stress.

(57) Broad-focus context

- a. **'intʃ** jɛʁ-ɑ-v  
 what happen.AOR-PST-3SG  
 'What happened?'  
 Ի՞նչ եղաւ:
- b. (Adv)<sub>ϕ</sub>, (S)<sub>ϕ</sub> (O V)<sub>ϕ</sub>  
**hetʃ**, dɔʁɑ-kʰ-ə bənaɡ-'ner-ə ləv-ɑ-tʰ-i-n  
 nothing, boy-PL-DEF plate-PL-DEF wash-TH-AOR-PST-3PL  
 'Nothing, the boys washed the dishes.'  
 Յէշ, տղաքը պնակները լուացին:

In the broad-focus context in (57b), nuclear stress is on the preverbal object. In general, nuclear stress is on the rightmost phrasal stress in the sentence. Thus for all the sentences in Section §6.3, nuclear stress was on the last prosodic phrase. Native grammars generally never discuss broad-focus nuclear stress, just focus-induced nuclear stress (Աբեղյան 1933: 23-4) which we postpone to Section §6.5.

In simple transitive sentences, stress is by default on the object. The object can be a bare singular (58a) or plural (58b), indefinite (58c) or definite (58d). The stressability of definite objects is discussed more in §6.4.3.



- (58) a. (S)<sub>φ</sub>      (O)      V)<sub>φ</sub>  
 mar'ja-n    na'mag    k'hə'r-e-ts-Ø-Ø  
 Maria-DEF letter    write-TH-AOR-PST-3SG  
 'Maria wrote letters.'  
 Մարիան նամակ գրեց:
- b. (S)<sub>φ</sub>      (O-PL)      V)<sub>φ</sub>  
 mar'ja-n    namag-'ner    k'hə'r-e-ts-Ø-Ø  
 Maria-DEF letter-PL    write-TH-AOR-PST-3SG  
 'Maria wrote letters.'  
 Մարիան նամակներ գրեց:
- c. (S)<sub>φ</sub>      (O-INDF)      V)<sub>φ</sub>  
 mar'ja-n    na'mag-mə    k'hə'r-e-ts-Ø-Ø  
 Maria-DEF letter-PL    write-TH-AOR-PST-3SG  
 'Maria wrote a letter.'  
 Մարիան նամակ մը գրեց:
- d. (S)<sub>φ</sub>      (O-DEF)      V)<sub>φ</sub>  
 mar'ja-n    na'mag-ə    k'hə'r-e-ts-Ø-Ø  
 Maria-DEF letter-DEF    write-TH-AOR-PST-3SG  
 'Maria wrote the letter.'  
 Մարիան նամակը գրեց:

Acoustically, for a simple SOV sentence with nuclear stress on the object, we find that the verb is deaccented and lacks any prominence. This means that we have post-focal compression or post-focal deaccenting. Such acoustic data is discussed in §6.5.1 in the general context of intonation.

### 6.4.2 Complex predicate

A special type of verb phrase is complex predicates. Such constructions consist of a verb that doesn't carry much lexical meaning like 'to do'. The verb is preceded by a noun. The noun+verb combination semantically carries the verbal action. This construction can then take its own object. Stress is on the (indirect) object if present (59a); else on the preverbal word (59b). Their prosody was further likewise earlier discussed in §6.3.3.3.

- (59) a. (S)<sub>φ</sub>      (O                      X                      V)<sub>φ</sub>  
 mar'ja-n    ara-'ji-n                      mə'dig    ə'r-a-v  
 Maria-DEF Ara-DAT-DEF X                      do.AOR-PST-3PST  
 'Maria listened to Ara.'

Մարիան Արային մտիկ ըրաւ:

- b. (S)<sub>φ</sub>            (X        V)<sub>φ</sub>  
 mar'ja-n    mə'dig ə'r-a-v  
 Maria-DEF X        do.AOR-PST-3PST  
 'Maria listened.'  
 Մարիան մտիկ ըրաւ:

The preverbal item can range from being a meaningless word (59b), a borrowed word (60a), a noun (60b), among other options.

- (60) a. (S)<sub>φ</sub>            (O                    X        V)<sub>φ</sub>  
 mar'ja-n    t<sup>h</sup>ux't-er-ə    'print<sup>h</sup> ə'r-a-v  
 Maria-DEF paper-PL-DEF X        do.AOR-PST-3PST  
 'Maria printed the papers.'  
 Մարիան թուղթերը 'print' ըրաւ:  
 b. (S)<sub>φ</sub>            (N        V)<sub>φ</sub>                            (    Adj        V)<sub>φ</sub>  
 k<sup>h</sup>ujn-əs    tsujts    gu-'d-a-Ø                    vor    hi'vant<sup>h</sup> =e-m  
 color-POSS.1SG sign    IND-give-TH-3PST that sick        =is-1SG  
 'My color shows that I am sick.'  
 Գոյնս ցոյց կու տայ որ հիւանդ եմ:

Native grammars provide more lists of such constructions, mostly from Eastern Armenian (Աբեղյան 1933: 20; Մարգարյան 1997: 75; Սևակ 2009: 153). But these are often also found in Western Armenian.

### 6.4.3 Stressability of objects

Section §6.4.1 included examples of nuclear stress on definite direct objects. Within the literature on prosody of Armenian and other related languages, it is often argued definite objects avoid getting nuclear stress unless they are focused (Dolatian 2022). Such a generalization is reported in Eastern Armenian (Kahnemuyipour & Megerdooimian 2011), Persian, Turkish, and even Western Armenian *cite persian/turkish stress from my paper*

For Turkish, the ban on stressed definitie objects was reported in earlier work by *cite persian/turkish stress from my paper*. But more recent work by Nakipoğlu (2009) discovered that most contexts that linguists use to elicit definite objects often treat the object as given information. By being given information, the object is then predictably deaccented. This section replicates Nakipoğlu (2009)'s work

but with Western Armenian. We again find that definite objects can carry nuclear stress without being focused.

First, consider the dialogue below. The question A (61a) and the answer B1 (61b) set up the context of noise and snow. Sentence B2 (61c) then introduces a definite object ‘the road’ which is new information. The object is new information and takes nuclear stress; stress is not on the verb. Nakipoğlu (2009) page number discusses the pragmatics of this sentence in depth. Basically, the object is new and stressed because the question in A didn’t presuppose the existence of roads. Stressing the verb is infelicitous (61d).

- (61) a. A: intʃ g-əlʹ-a-Ø =gor? intʃ =e ajs aʃmug-ə?  
 what IND-be-TH-3SG =PROG? what =is this noise-DEF?  
 ‘What is happening? What is this noise?’  
 Ի՞նչ կ’ըլլայ կոր: Ի՞նչ է այս աղմուկը:
- b. B1: je’reɡ kʰiʃer-ə ʃad ʔsujn je’g-er =e-Ø-r  
 last night-DEF many snow come.AOR-EPTCP =is-PST-3SG  
 ‘Last night it snowed a lot.’  
 Երէկ գիշերը շատ ծիւն եկեր էր:
- c. B2: (S)<sub>ϕ</sub> (O-DEF) (V)<sub>ϕ</sub>  
 garavaruʔtʰjɹn-ə dʒamʰa-n gə-makʰr-e-Ø=gor  
 government-DEF road-DEF IND-clean-TH-3SG=PROG  
 ‘The government is cleaning the road.’  
 Կառավարութիւնը ճամբան կը մաքրէ կոր:
- d. #B2: (S)<sub>ϕ</sub> (O-DEF)<sub>ϕ</sub> (V)<sub>ϕ</sub>  
 garavaruʔtʰjɹn-ə dʒamʰa-n gə-makʰr-e-Ø=gor

In contrast consider the dialogue below. Sentence A (62a) presupposes the existence of roads where people drive cars. Sentence B1 (62b) explicitly introduces the definite object ‘the road’ but it does not get nuclear stress. The object is treated as given information, because it is implied from sentence A. Stressing the object is infelicitous (62c).

- (62) a. A: jereg kʰiʃer-ə ʃad ʔsujn jeg-er =e-Ø-r. tʰerevəs  
 last night-DEF many snow come.AOR-EPTCP =is-PST-3SG. perhaps  
tʃ-em gərʹn-a-r oʔo-ʹjov kʰorʹdʒ-i jerʹtʰ-a-l  
 NEG-is-1SG can-TH-CN car-INS work-DAT go-TH-INF  
 ‘Last night it snowed a lot. Perhaps I can’t go to work by car.’  
 Երէկ գիշերը շատ ծիւն եկեր էր: Թերեւս չեմ կրնար օթոյով գործի երթալ:

- b. B1: (S)<sub>φ</sub> (O-DEF)<sub>φ</sub> (V)<sub>φ</sub>  
garavaru't<sup>h</sup>j<sup>h</sup>yn-ə dʒam'p<sup>h</sup>a-n gə-mak<sup>h</sup>r-e-Ø=gor  
government-DEF road-DEF IND-clean-TH-3SG=PROG  
'The government is cleaning the road.'  
Կառավարութիւնը ճամբան կը մաքրէ կոր:
- c. #B1 (S)<sub>φ</sub> (O-DEF V)<sub>φ</sub>  
garavaru't<sup>h</sup>j<sup>h</sup>un-ə dʒam'p<sup>h</sup>a-n gə-mak<sup>h</sup>r-e-Ø=gor
- d. B2: gər'n-a-s ot<sup>h</sup>o-'jov jer't<sup>h</sup>-a-l  
can-TH-2SG car-INS go-TH-INF  
'You can go by car.'  
Կրնաս օթօյով երթալ:

Thus, when special contexts permit, a definite object can be introduced as new information. When new, the object gets phrasal stress and nuclear stress. Another type of context that allows stressed definite objects is narratives. In the narrative below (63), the speaker is narrating events as they happen. The subject Ara is doing actions in a sequence; each actions introduces a definite object and it gets stressed.

(63) Stress on definite objects in narratives (adapted from nakipoluge source)

- a. (S)<sub>φ</sub> (Loc V)<sub>φ</sub>  
a'ra-n 'dun je'g-a-v  
Ara house come.AOR-PST-3SG  
'Ara came home.'  
Արան տուն եկաւ:
- b. (N)<sub>φ</sub> (O V)<sub>φ</sub>  
bajsa'g-e-n p<sup>h</sup>ana'li-n ha'n-e-ts-Ø-Ø  
bag-ABL-DEF key-DEF take-TH-AOR-PST-3SG  
'He took the key out of his bag.'  
Պայսակէն բանալին հանեց:
- c. (O V)<sub>φ</sub>  
't<sup>h</sup>ur-ə p<sup>h</sup>a'ts-a-v  
door-DEF open.AOR-PST-3SG  
'He opened the door.'  
Դուռը բացաւ:

- d. (Loc)<sub>φ</sub>      (Adj V)<sub>φ</sub>,      (O      V)<sub>φ</sub>  
'ners-ə      'bax =e-Ø-r,      badu'han-ə      k<sup>h</sup>o'ts-e-ts-Ø-Ø  
 inside-DEF cold =is-PST-3SG, window-DEF close-TH-AOR-PST-3SG  
 'It was cold inside, He closed the window.'  
 Ներսը պաղ էր. պատուհանը գոցեց:
- e. (O      V)<sub>φ</sub>  
vara'k<sup>h</sup>ujr-ə      k<sup>h</sup>o'ts-e-ts-Ø-Ø  
 curtain-DEF close-TH-AOR-PST-3SG  
 'He drew the curtain.'  
 Վարագոյրը գոցեց:
- f. (Loc      V)<sub>φ</sub>,      (O      V)<sub>φ</sub>  
p<sup>h</sup>ax'nik<sup>h</sup>      k<sup>h</sup>ə'n-a-ts-Ø-Ø,      'lujs-ə      p<sup>h</sup>a'ts-a-v  
 bathroom go.AOR-TH-AOR-PST-3SG, light-DEF open.AOR-PST-3SG  
 'He went to the bathroom; he turned on the lights.'  
 Բաղնիք գնաց, լոյսը բացաւ:
- g. (O      V)<sub>φ</sub>  
o'dʒar-ə      p<sup>h</sup>ənd'r-e-ts-Ø-Ø  
 soap-DEF look.for-TH-AOR-PST-3SG  
 'He looked for the soap.'  
 Օճառը փնտռեց:
- h. (O      V)<sub>φ</sub>  
'tserk<sup>h</sup>-ə      lə'v-a-ts-Ø-Ø  
 hand-def wash-TH-AOR-PST-3SG  
 'He washed his hands.'  
 Ձեռքը լուաց:
- i. (C      V)<sub>φ</sub>,      (O      V)<sub>φ</sub>  
 vorbe'si lok<sup>h</sup>'n-a-Ø,      lok<sup>h</sup>a'ran-ə      le-'tsu-ts-Ø-Ø  
 for bathe-TH-3SG, bathtub-DEF fill-CAUS-AOR-PST-3SG  
 'He filled the bathtub to take a bath.'  
 Որպէսզի լոզնայ, լոզարանը լեցուց:

Thus, definite objects can get nuclear stress without needing focus. This is contrast to Eastern Armenian and Persian, where definite objects are reported to get stress only if focused. *ea persian literature*.

#### 6.4.4 Ditransitive

In a ditransitive sentence, the verb has two objects: a direct object (DO) and an indirect object (IO). The verb forms a prosodic phrase with the rightmost object (the preverbal object), and stress is on this object. The linear order between DOs and IOs is quite variable. See **ditransitive order** for their syntax. This section focuses on their prosody.

First, consider the order IO+DO. The DO can be bare singular (64a) or plural (64b), indefinite (64c) or definite (64d). The DO is phrased with the verb and takes stress.

- (64) a. (S)<sub>φ</sub> (IO)<sub>φ</sub> (DO V)<sub>φ</sub>  
 ɑ'ra-n gadu-'ji-n ba'nir də'v-a-v  
 Ara-DEF cat-DAT-DEF cheese give.AOR-PST-3SG  
 'Ara gave some cheese to the cat.'  
 Արան կատուին պանիր տուաւ:
- b. ɑ'ra-n gadu-'ji-n mu'g-er də'v-a-v  
 Ara-DEF cat-DAT-DEF mouse-PL give.AOR-PST-3SG  
 'Ara gave some mice to the cat.'  
 Արան կատուին մուկեր տուաւ:
- c. ɑ'ra-n gadu-'ji-n 'mug-mə də'v-a-v  
 Ara-DEF cat-DAT-DEF mouse-INDF give.AOR-PST-3SG  
 'Ara gave a mouse to the cat.'  
 Արան կատուին մուկ մը տուաւ:
- d. ɑ'ra-n gadu-'ji-n ba'nir-ə də'v-a-v  
 Ara-DEF cat-DAT-DEF cheese-DEF give.AOR-PST-3SG  
 'Ara gave the cheese to the cat.'  
 Արան կատուին պանիրը տուաւ:

The difference in perception between the IO and DO is stronger when the IO has a modifier (65). The larger prosodic phrase of the IO causes a longer pause before the DO.

- (65) a. (Adj IO)<sub>φ</sub> (DO V)<sub>φ</sub>  
 ɑno'tʰi gadu-'ji-n ba'nir də'v-a-v  
 hungry cat-DAT-DEF cheese give.AOR-PST-3SG  
 'He gave some cheese to the hungry cat.'  
 Անօթի կատուին պանիր տուաւ:

- b.  $\text{ano't'i}$   $\text{gadu-'ji-n}$   $\text{mu'g-er}$   $\text{də'v-a-v}$   
 hungry cat-DAT-DEF mouse-PL give.AOR-PST-3SG  
 ‘He gave some mice to the hungry cat.’  
 Անօթի կատուին մուկեր տուաւ:
- c.  $\text{ano't'i}$   $\text{gadu-'ji-n}$   $\text{'mug-mə}$   $\text{də'v-a-v}$   
 hungry cat-DAT-DEF mouse-INDF give.AOR-PST-3SG  
 ‘He gave a mouse to the hungry cat.’  
 Անօթի կատուին մուկ մը տուաւ:
- d.  $\text{ano't'i}$   $\text{gadu-'ji-n}$   $\text{ba'nir-ə}$   $\text{də'v-a-v}$   
 hungry cat-DAT-DEF cheese-DEF give.AOR-PST-3SG  
 ‘He gave the cheese to the hungry cat.’  
 Անօթի կատուին պանիրը տուաւ:

For the DO+IO order (66), the IO is phrased with the verb and gets stressed.

- (66) a.  $(S)_\phi$   $(DO)_\phi$   $(IO$   $V)_\phi$   
 $\text{a'ra-n}$   $\text{ba'nir-ə}$   $\text{gadu-'ji-mə}$   $\text{də'v-a-v}$   
 Ara-DEF cheese-DEF cat-DAT-INDF give.AOR-PST-3SG  
 ‘Ara gave the cheese to a cat.’  
 Արան պանիրը կատուի մը տուաւ:
- b.  $\text{a'ra-n}$   $\text{ba'nir-ə}$   $\text{gadu-ne'r-u}$   $\text{də'v-a-v}$   
 Ara-DEF cheese-DEF cat-PL-DAT give.AOR-PST-3SG  
 ‘Ara gave the cheese to some cats.’  
 Արան պանիրը կատուներու տուաւ:
- c.  $\text{a'ra-n}$   $\text{ba'nir-ə}$   $\text{gadu-'ji-n}$   $\text{də'v-a-v}$   
 Ara-DEF cheese-DEF cat-DAT-DEF give.AOR-PST-3SG  
 ‘Ara gave the cheese to the cat.’  
 Արան պանիրը կատուին տուաւ:

Again, if the DO is bigger 67, we find a longer pause between the DO and IO.

- (67) a.  $(\text{Adj } DO)_\phi$   $(IO$   $V)_\phi$   
 $\text{t'e'xin}$   $\text{ba'nir-ə}$   $\text{gadu-'ji-mə}$   $\text{də'v-a-v}$   
 yellow cheese-DEF cat-DAT-INDF give.AOR-PST-3SG  
 ‘He gave the yellow cheese to a cat.’  
 Դեղինդեղին պանիրը կատուի մը տուաւ:

- b. t<sup>h</sup>e'xin ba'nir-ə gadu-ne'r-u də'v-a-v  
 yellow cheese-DEF cat-PL-DAT give.AOR-PST-3SG  
 'He gave the yellow cheese to some cats.'  
 Դեղինեղին պանիրը կատուներու տուաւ:
- c. t<sup>h</sup>e'xin ba'nir-ə gadu-'ji-n də'v-a-v  
 yellow cheese-DEF cat-DAT-DEF give.AOR-PST-3SG  
 'He gave the yellow cheese to the cat.'  
 Դեղինեղին պանիրը կատուին տուաւ:

In the above sentences, the first object was definite and could thus be placed earlier in the sentence. If the first object is indefinite, we still find that only the second object gets stress, whether for IO+DO (68) or DO+IO (69).

- (68) a. (S)<sub>φ</sub> (IO)<sub>φ</sub> (DO V)<sub>φ</sub>  
 a'ra-n gadu-'ji-mə ba'nir də'v-a-v  
 Ara-DEF cat-DAT-INDF cheese give.AOR-PST-3SG  
 'Ara gave some cheese to a cat.'  
 Արան կատուի մը պանիր տուաւ:
- b. a'ra-n gadu-'ji-mə mu'g-er də'v-a-v  
 Ara-DEF cat-DAT-INDF mouse-PL give.AOR-PST-3SG  
 'Ara gave some mice to a cat.'  
 Արան կատուի մը մուկեր տուաւ:
- c. a'ra-n gadu-'ji-mə 'mug-mə də'v-a-v  
 Ara-DEF cat-DAT-INDF mouse-INDF give.AOR-PST-3SG  
 'Ara gave a mouse to a cat.'  
 Արան կատուի մը մուկ մը տուաւ:
- d. a'ra-n gadu-'ji-mə ba'nir-ə də'v-a-v  
 Ara-DEF cat-DAT-INDF cheese-DEF give.AOR-PST-3SG  
 'Ara gave the cheese to a cat.'  
 Արան կատուի մը պանիրը տուաւ:
- (69) a. (S)<sub>φ</sub> (DO)<sub>φ</sub> (IO V)<sub>φ</sub>  
 a'ra-n 'mug-mə gadu-'ji-mə də'v-a-v  
 Ara-DEF mouse-INDF cat-DAT-INDF give.AOR-PST-3SG  
 'Ara gave a mouse to a cat.'  
 Արան մուկ մը կատուի մը տուաւ:



- b.  $\alpha'ra-n$  'mug-mə gadu-ne'r-u dəv-α-v  
 Ara-DEF mouse-INDF cat-PL-DAT give.AOR-PST-3SG

‘Ara gave a mouse to some cats.’

Արան մուկ մը կատուներու տուաւ:

- c.  $\alpha'ra-n$  'mug-mə gadu-'ji-n dəv-α-v  
 Ara-DEF mouse-INDF cat-DAT-DEF give.AOR-PST-3SG

‘Ara gave a mouse to the cat.’

Արան մուկ մը կատուին տուաւ:

The difference in prominence is again clearer if the first object is bigger (70).

- (70) a. (Adj IO)<sub>φ</sub> (DO V)<sub>φ</sub>  
 ano't'i gadu-'ji-mə ba'nir dəv-α-v  
 hungry cat-DAT-INDF cheese give.AOR-PST-3SG  
 ‘He gave some cheese to a hungry cat.’  
 Անօթի կատուի մը պանիր տուաւ:
- b. ano't'i gadu-'ji-mə mu'g-er dəv-α-v  
 hungry cat-DAT-INDF mouse-PL give.AOR-PST-3SG  
 ‘He gave some mice to a cat.’  
 Անօթի կատուի մը մուկեր տուաւ:
- c. ano't'i gadu-'ji-mə 'mug-mə dəv-α-v  
 hungry cat-DAT-INDF mouse-INDF give.AOR-PST-3SG  
 ‘He gave a mouse to a hungry cat.’  
 Անօթի կատուի մը մուկ մը տուաւ:
- d. ano't'i gadu-'ji-mə ba'nir-ə dəv-α-v  
 hungry cat-DAT-INDF cheese-DEF give.AOR-PST-3SG  
 ‘He gave the cheese to a hungry cat.’  
 Անօթի կատուի մը պանիրը տուաւ:
- (71) a. (Adj DO)<sub>φ</sub> (IO V)<sub>φ</sub>  
 bəz'dig 'mug-mə gadu-'ji-mə dəv-α-v  
 small mouse-INDF cat-DAT-INDF give.AOR-PST-3SG  
 ‘He gave a small mouse to a cat.’  
 Պզտիկ մուկ մը կատուի մը տուաւ:
- b. bəz'dig 'mug-mə gadu-ne'r-u dəv-α-v  
 small mouse-INDF cat-PL-DAT give.AOR-PST-3SG  
 ‘He gave a small mouse to some cats.’  
 Պզտիկ մուկ մը կատուներու տուաւ:

- c. bəz'dig 'mug-mə      gadu-'ji-n      də'v-a-v  
 small mouse-INDF cat-DAT-DEF give.AOR-PST-3SG  
 'He gave a small mouse to the cat.'  
 Պզտիկ մուկ մը կատուին տուաւ:

In sum, in a ditransitive sentence, the second preverbal object is phrased with the verb and takes stress.

#### 6.4.5 Other transitive word orders

In all the above sentences, the basic sentence structure is SOV with stress on the preverbal item. If the object of a transitive verb is omitted (SV) as in (72), then stress is on the verb. The transitive subject stays in a separate prosodic phrase

- (72) (S)<sub>φ</sub>      (V)<sub>φ</sub>  
 mar'ja-n      k'hər-e-t s-Ø-Ø  
 Maria-DEF write-TH-AOR-PST-3SG  
 'Maria wrote (stuff).'  
 Մարիան գրեց:

SOV is the default order (73a), but other word orders are logically possible, such as OVS (73b) or SVO (73c), but they each entail some type of shift in emphasis or deaccenting. For example, an OVS sentence implies that the subject is an afterthought. Here, nuclear stress is on the last phonological phrase (the subject). In SVO, each word is its own prosodic phrase, and stress is on the last one.

- (73) a. (S)<sub>φ</sub>      (O      V)<sub>φ</sub>  
 mar'ja-n      namag-'ner u'n-i-Ø  
 Maria-DEF letter-PL have-TH-3SG  
 'Maria has letters.' (default order)  
 Մարիան նամակներ ունի:
- b. (O      V)<sub>φ</sub>      (S)<sub>φ</sub>  
 namag-'ner u'n-i-Ø      mar'ja-n  
 letter-PL have-TH-3SG Maria-DEF  
 'Maria has letters.' ('Maria' is an afterthought)  
 Նամակներ ունի Մարիան:

- c. (S)<sub>φ</sub>            (V)<sub>φ</sub>            (O)<sub>φ</sub>  
 mar'ja-n    u'n-i-∅        namag-'ner  
 Maria-DEF have-TH-3SG letter-PL  
 'Maria has letters.' ('Maria' and 'has' are treated as given)  
 Մարիան ունի նամակներ:

### 6.4.6 Intransitives and passives

The previous sections focused on (di)transitive sentences, where the verb placed stress on a preceding object. All types of objects received nuclear stress, whether bare or definite. For other types of valency or voices, we find variation in stress placement. We focus on unaccusatives (6.4.6.1), unergatives (6.4.6.2), and passives (6.4.6.3).

When the pre-verbal noun is indefinite, this noun gets nuclear stress regardless if it a transitive object, unaccusative subject, unergative subject, or passivized object. However, verbs vary in whether definite noun phrases get stressed. A definite transitive object or definite unaccusative subject gets nuclear stress, while a definite unergative subject or definite passivized object does not get stress.

#### 6.4.6.1 Unaccusative verbs

First consider unaccusative verbs. These are intransitive verbs where the subject semantically acts more as the undergoer of the verbal action, rather than the doer of the verbal action; the verbal action essentially happens. For example, the subject of 'to come' happens to arrive. Other verbs like 'to die' or 'to fall' are also unaccusative.

For transitive verbs, the object can be morphologically bare singular or plural, indefinite or definite; and it takes stress. Similarly, the subject of an unaccusative verb can be morphologically bare singular (74a) vs. plural (74b), indefinite (74c) vs. or definite (74d). In all cases, stress is on the subject.

- (74) a. (S            V)<sub>φ</sub>  
           na'mag je'g-a-v  
           letter    come.AOR-PST-3SG  
           'Some letters came.'  
           Նամակ եկաւ:
- b. (S-PL            V)<sub>φ</sub>  
           namag-'ner je'g-a-n  
           letter-PL    come.AOR-PST-3PL

‘Some letters came.’

Նամակներ եկան:

- c. (S-INDF V)<sub>φ</sub>  
 na'mag-mə je'g-a-v  
 letter-INDF come.AOR-PST-3SG

‘A letter came.’

Նամակ մը եկաւ:

- d. (S-DEF V)<sub>φ</sub>  
 na'mag-ə je'g-a-v  
 letter-DEF come.AOR-PST-3SG

‘The letter came.’

Նամակը եկաւ:

The above sentences used the verb ‘to come’. The same judgments are found for other unnaccusative verbs like ‘to fall’ (75a) and ‘to die’ (75b).

- (75) a. i. (S V)<sub>φ</sub>  
 bə'nag inj'g-a-v  
 plate fall.AOR-PST-3SG  
 ‘Some plates fell.’  
 Բնակ ինկաւ:
- ii. (S-PL V)<sub>φ</sub>  
 bə'nag-'ner inj'g-a-n  
 plate-PL fall.AOR-PST-3PL  
 ‘Some plates fell.’  
 Բնակներ ինկան:
- iii. (S-INDF V)<sub>φ</sub>  
 bə'nag-mə inj'g-a-v  
 plate-INDF fall.AOR-PST-3SG  
 ‘A plate fell.’  
 Բնակ մը ինկաւ:
- iv. (S-DEF V)<sub>φ</sub>  
 bə'nag-ə inj'g-a-v  
 plate-DEF fall.AOR-PST-3SG  
 ‘The plate fell.’  
 Բնակը ինկաւ:

- b. i. (S V)<sub>φ</sub>  
ga'du me'r-a-v  
 cat die-PST-3SG  
 'Some cats died.'  
 Կատու մեռաւ:
- ii. (S-PL V)<sub>φ</sub>  
gadu-'ner me'r-a-n  
 cat-PL die-PST-3PL  
 'Some cats died.'  
 Կատուներ մեռան:
- iii. (S-INDF V)<sub>φ</sub>  
ga'du-mə me'r-a-v  
 cat-INDF die-PST-3SG  
 'A cat died.'  
 Կատու մը մեռաւ:
- iv. (S-DEF V)<sub>φ</sub>  
ga'du-n me'r-a-v  
 cat-DEF die-PST-3SG  
 'The cat died.'  
 Կատուն մեռաւ:

A special type of unaccusative verb is the verb 'to exist' or [ga] (76). Stress is again on the subject.

- (76) a. (S V)<sub>φ</sub>  
bad'dʒar 'g-a-∅  
 reason exist-TH-3SG  
 'There's a reason.'  
 Պատճառ կայ:
- b. (S-PL V)<sub>φ</sub>  
baddʒar-'ner 'g-a-n  
 reason-PL exist-TH-3PL  
 'There are reasons.'  
 Պատճառներ կան:
- c. (S-INDF V)<sub>φ</sub>  
bad'dʒar-mə 'g-a-∅  
 reason-INDF exist-TH-3SG

‘There’s a reason.’

Պատճառ մը կայ:

- d. (S-DEF V)<sub>φ</sub>  
 bað'dʒaɾ-ə 'g-a-Ø  
 reason-DEF exist-TH-3SG

‘There’s the reason.’

Պատճառը կայ:

In sum, an unaccusative subject gets stress like a transitive object.

#### 6.4.6.2 Unergative verbs

In contrast to unaccusative verbs, an unergative verb is an intransitive verb where the subject is the doer of the verbal action. An example is the verb ‘to run’. A morphosyntactic contrast between unaccusative and unergative verbs is that the subject of an accusative can be morphologically bare (77a), but the subject of an unergative is generally not (77b).

- (77) a. (S V)<sub>φ</sub>  
 gəɾ'ja me'r-a-v  
 tortoise die-PST-3SG  
 ‘Some tortoise died.’  
 Կրիայ մեռաւ:
- b. \*?gəɾ'ja va'z-e-ts-Ø-Ø  
 tortoise run-TH-AOR-PST-3SG  
 ‘Some tortoise ran.’  
 Կրիայ վազեց:

The subject of an unergative must have some type of inflectional suffix, such as a plural suffix (78a), indefinite suffix (78b), or the definite suffix (78c). A bare plural and indefinite subject is stressed, but the definite subject is not stressed.

- (78) a. (S-PL V)<sub>φ</sub>  
 gəɾja-'neɾ va'z-e-ts-i-n  
 tortoise-PL run-TH-AOR-PST-3PL  
 ‘Some tortoises ran.’  
 Կրիաներ վազեցին:

- b. (S-INDF      V)<sub>φ</sub>  
gər'jɑ-mə      vɑ'z-e-ts-Ø-Ø  
 tortoise-INDF run-TH-AOR-PST-3SG  
 'A tortoise ran.'  
 Կրիայ մը վազեց:
- c. (S-DEF)<sub>φ</sub>      (V)<sub>φ</sub>  
gər'jɑ-n      vɑ'z-e-ts-Ø-Ø  
 tortoise-DEF run-TH-AOR-PST-3SG  
 'The tortoise ran.'  
 Կրիան վազեց:

A definite unergative subject is phrased separately from the verb. The same generalizations apply to other unergative verbs like 'to shout' (79a) or 'to laugh' (79b).

- (79) a. i. (S-PL      V)<sub>φ</sub>  
manug-'ner bo'r-a-ts-i-n  
 child-PL shout-TH-AOR-PST-3PL  
 'Some children shouted.'  
 Մանուկներ պոռաղին:
- ii. (S-INDF      V)<sub>φ</sub>  
ma'nug-mə bo'r-a-ts-Ø-Ø  
 child-INDF shout-TH-AOR-PST-3SG  
 'A child shouted.'  
 Մանուկ մը պոռաղ:
- iii. (S-DEF)<sub>φ</sub> (V)<sub>φ</sub>  
ma'nug-ə bo'r-a-ts-Ø-Ø  
 child-DEF shout-TH-AOR-PST-3SG  
 'The child shouted.'  
 Մանուկը պոռաղ:
- b. i. (S-PL      V)<sub>φ</sub>  
gabig-'ner χənt<sup>h</sup>-a-ts-i-n  
 monkey-PL laugh-TH-AOR-PST-3PL  
 'Some monkeys laughed.'  
 Կապիկներ խնդաղին:

- ii. (S-INDF      V)<sub>φ</sub>  
gɑ'big-mə      χən't<sup>h</sup>-ɑ-ts-∅-∅  
 monkey-INDF laugh-TH-AOR-PST-3SG  
 'A monkey laughed.'  
 Կապիկ մը խնդաց:
- iii. (S-DEF)<sub>φ</sub>      (V)<sub>φ</sub>  
 gɑ'big-ə      χən't<sup>h</sup>-ɑ-ts-∅-∅  
 monkey-DEF laugh-TH-AOR-PST-3SG  
 'The monkey laughed.'  
 Կապիկը խնդաց:

Thus, intransitives avoid stress on definite subjects. Corroborating data also comes from relative clause extraposition (§6.6.2).

#### 6.4.6.3 Passive verbs

A transitive active verb can be passivized by adding the passive suffix to the verb. The direct object gets promoted to the grammatical subject. The passivized object can be bare (80b), just like an active object (80a).

- (80) a. (S)<sub>φ</sub>      (O      V)<sub>φ</sub>  
 'mart<sup>h</sup>-ə      nɑ'mag      k<sup>h</sup>ər-e-ts-∅-∅  
 man-DEF letter write-TH-AOR-PST-3SG  
 'The man wrote letters.'  
 Մարդը նամակ գրեց:
- b. (S      V-PASS)<sub>φ</sub>  
 nɑ'mag      k<sup>h</sup>ər-v-e-ts-ɑ-v  
 letter write-PASS-TH-AOR-PST-3SG  
 'Some letter was written.'  
 Նամակ գրուեցաւ:

The passivized object can be bare singular (80b) or plural (81a), indefinite (81b) or definite (81c). The first three conditions place stress on the passivized object. But a definite passivized object (81c) prefers to be phrased separately from the verb, with stress on the verb.

- (81) a. (S-PL      V-PASS)<sub>φ</sub>  
 namag-'ner      k<sup>h</sup>ər-v-e-ts-ɑ-n  
 letter-PL write-PASS-TH-AOR-PST-3PL



‘Some letters were written.’

Նամակներ գրուեցան:

- b. (S-INDF V-PASS)<sub>φ</sub>  
 na'mag-mə kʰər-v-e-ts-a-v  
 letter-INDF write-PASS-TH-AOR-PST-3SG

‘A letter was written.’

Նամակ մը գրուեցաւ:

- c. (S-DEF)<sub>φ</sub> (V-PASS)<sub>φ</sub>  
 na'mag-ə kʰər-v-e-ts-a-v  
 letter-DEF write-PASS-TH-AOR-PST-3SG

‘The letter was written.’

Նամակը գրուեցաւ:

Some judgments seem constant for any passive verb, such as ‘to be killed’ (82).

- (82) a. (S V-PASS)<sub>φ</sub>  
 tʰəʃna'mi əspənnə-v-e-ts-a-v  
 enemy kill-PASS-TH-AOR-PST-3SG  
 ‘Some enemy was killed.’  
 Թշնամի սպաննուեցաւ:
- b. (S-PL V-PASS)<sub>φ</sub>  
 tʰəʃnami-'ner əspənnə-v-e-ts-a-n  
 enemy-PL kill-PASS-TH-AOR-PST-3PL  
 ‘Some enemies were killed.’  
 Թշնամիներ սպաննուեցան:
- c. (S-INDF V-PASS)<sub>φ</sub>  
 tʰəʃna'mi-mə əspənnə-v-e-ts-a-v  
 enemy-INDF kill-PASS-TH-AOR-PST-3SG  
 ‘An enemy was killed.’  
 Թշնամի մը սպաննուեցաւ:
- d. (S-DEF)<sub>φ</sub> (V-PASS)<sub>φ</sub>  
 tʰəʃna'mi-n əspənnə-v-e-ts-a-v  
 enemy-DEF kill-PASS-TH-AOR-PST-3SG  
 ‘The enemy was killed.’  
 Թշնամին սպաննուեցաւ:

Thus, intransitives and passives pattern together in avoiding stress on definite subjects. Corroborating data also comes from relative clause extraposition (§6.6.2).

## 6.5 Intonation of declaratives, questions, and focus

In contrast to a broad-focus context, a context is said to have narrow focus if some word has more semantic salience than others. In declarative sentences, this can be a word with negation or a word that is focused. In interrogatives or questions, this is the word that is being questioned. This section goes through the basic acoustics of declaratives in broad focus (§6.5.1), and then an in-depth catalog of intonational contours for narrow-focus contexts. These narrow-focus contexts involve negation (§6.5.1), polar questions and their answers (§6.5.2), and wh-questions and their answers (§6.5.3). We did not consider more complex types of questions such as choice questions or multiple-wh questions, but see Toparlak & Dolatian (2022) for preliminary results.

Throughout this section, we concentrate on marking the words which get nuclear stress (underlined) and on marking the sentence-final pitch (with arrows ↘, ↗). Building off of Toparlak & Dolatian (2022), we use simple autosegmental-metrical annotation for nuclear stress (H\*) and for sentence-final pitches (L%, H%).

Note that in many contexts, we find post-focal deaccenting after the focused or nuclear stress-bearing word. Impressionistically, we still perceive prosodic phrase boundaries and lexical stress, so we demarcate such phrases and lexical stresses. But such impressions are likely just a psycholinguistic illusions.

### 6.5.1 Declarative sentences with and without negation

This section goes over the intonation of basic declaratives. We find various general acoustic properties:

- Declination: The pitch of the sentence decreases as we go from left to right.
- Falling tone: Declarative sentences end in falling pitch L%.
- Nuclear stress: Nuclear stress is marked by a prominent high pitch H\*.
- Negation: Negated verbs attract nuclear stress.
- Post-focal deaccenting: After the word nuclear stress, lexical stresses are weakened.

We first go over basic SOV declaratives, in the positive and negative (§6.5.1.1). We then discuss the intonation of periphrastic or cliticized verb phrases (§6.5.1.2), and then other word orders like OVS (§6.5.1.3).

## 6.5.1.1 Basic SOV declarative sentences

A simple declarative sentence has positive polarity if there is no negation. For a simple SOV sentence (83), we find stress on the object (H\*), and then a sentence-final fall (L%).

- (83) (S)<sub>φ</sub>      (O)      (V)<sub>φ</sub>      ↘  
          mar'ja-n    na'mag    u'n-i-∅      ↘  
          Maria-DEF letter    have-TH-3SG  
          ‘Maria has some letters.’  
          Մարիան նամակ ունի:

The pitch track for this positive declarative is in (). Acoustically, the positive sentence has prominence H\* on the object, the verb is deaccented via post-focal compression, and then the sentence ends in final L%. The pitch of the subject seems higher than the pitch of the object. This suggests that Armenian has pitch downdrift or declension within a sentence.

[draw](#)

To create a negative sentence, the negation prefix *tj-* is added to the verb (84). Stress then shifts to this negated verb. Although we're not completely sure, we suspect that the object and negated verb are now separated into two separate prosodic phrases.

- (84) (S)<sub>φ</sub>      (O)<sub>φ</sub>      (NEG-V)<sub>φ</sub>      ↘  
          mar'ja-n    na'mag    tj-un-i-∅      ↘  
          Maria-DEF letter    NEG-have-TH-3SG  
          ‘Maria does not have letters.’  
          Մարիան նամակ չունի:

Note that lexical stress is on the first syllable of the negated verb. For more prosodic data on negation in words, see §5.4.1.

Acoustically for the negative version, stress H\* is on the negated verb (in its first syllable). The rest of the verb is deaccented and we again end in a final L%.

[draw](#)

## 6.5.1.2 SOV declarative sentences with complex verb phrases

There are other possible morphosyntactic permutations for declarative positive and negative sentences. These all show the same basic intonational shapes.

Consider cliticized verbs. In a predicate sentence (S-Adj-V), stress is on the adjective while the verb is a copular enclitic (85a). When the sentence is negated (85b), the negation prefix is placed on the copula, and the copula becomes its own standalone word (a prosodic word) with nuclear stress.

- (85) a. (S)<sub>φ</sub> (Adj) Cop)<sub>φ</sub> ↘  
mar'ja-n gar'mir =e  
Maria-DEF red =is  
'Maria is red.'  
Մարիան կարմիր է:
- b. (S)<sub>φ</sub> (Adj)<sub>φ</sub> (NEG-Cop)<sub>φ</sub> ↘  
mar'ja-n gar'mir tʃ-e ↘  
Maria-DEF red NEG-is  
'Maria is not red.'  
Մարիան կարմիր չէ:

We see pitch-tracks in (). Note how the negated copula has a perceivable rise at the beginning of its only syllable, and then falls due to the sentence-final fall L%.

draw

We can see the interaction between negation stress and the sentence-final fall when the copula is bisyllabic. In the positive (86a), the copula is unstressed, while the negative form (86b) has stress on the first syllable of the copula.

- (86) a. (S)<sub>φ</sub> (Adj) Cop)<sub>φ</sub> ↘  
də'χa-k<sup>h</sup>-ə gar'mir =e-ji-n ↘  
boy-PLDEF red =is-PST-3PL  
'The boys were red.'  
Տղաքը կարմիր էին:
- b. (S)<sub>φ</sub> (Adj)<sub>φ</sub> (NEG-Cop)<sub>φ</sub> ↘  
də'χa-k<sup>h</sup>-ə gar'mir tʃ-e-ji-n ↘  
boy-PL-DEF red NEG-is-PST-3PL  
'The boys were not red.'  
Տղաքը կարմիր չէին:

Notice how in the above constructions, the negated verb was the final word in the sentence. This is usually the case. But there are inflectional paradigms where the verb is periphrastic, and this creates sentences where the negated element is

earlier in the sentence. For example, consider the present perfect. This consists of a participle and the inflected auxiliary. In the positive (87a), stress is early in the sentence on the preverbal object. But in the negative (87b), the auxiliary is negated and placed before the verb. This negated auxiliary carries stress (§5.4.2).

- (87) a. (S)<sub>φ</sub>      (O)      V      Aux)<sub>φ</sub> ↘  
mar'ja-n    namag-'ner    k<sup>h</sup>ə'r-adz    =e ↘  
Maria-DEF letter-PL    write-RPTCP =is  
'Maria has written letters.'  
Մարիան նամակներ գրած է:
- b. (S)<sub>φ</sub>      (O)      (NEG-Aux V)<sub>φ</sub>      ↘  
mar'ja-n    namag-'ner    tʃ-e    k<sup>h</sup>ə'r-adz    ↘  
Maria-DEF letter-PL    NEG-is    write-RPTCP  
'Maria has not written letters.'  
Մարիան նամակներ չէ գրած:

Acoustically, the positive has stress H\* on the object, while the participle and auxiliary are deaccented. In the negative, the auxiliary has stress H\*, and causes deaccenting on the final participle.

draw

Other similarly long inflectional constructions include the simple future. The verb takes a future proclitic *bidi*. In the positive (88a), stress is on the preverbal object (here a locative noun). In the negative (88b), the negation prefix is placed on the verb, and stress is on the verb.

- (88) a. (S)<sub>φ</sub>      (O)      Pro V)<sub>φ</sub>      ↘  
mar'ja-n    'dun    bidi    jer't<sup>h</sup>-a-∅    ↘  
Maria-DEF home FUT go-TH-3SG  
'Maria will go home.'  
Մարիան տուն պիտի երթայ:
- b. (S)<sub>φ</sub>      (O)<sub>φ</sub>      (Pro NEG-V)<sub>φ</sub>      ↘  
mar'ja-n    dun    bidi    tʃ-ert<sup>h</sup>-a-∅    ↘  
Maria-DEF home FUT NEG-go-TH-3SG  
'Maria will not go home.'  
Մարիան տուն պիտի չերթայ:

Pitch-tracks confirm our impressions.

draw

Some periphrastic constructions combine the main verb (as a participle) with a light verb. In the positive (89a), the participle carries stress, while the light verb is deaccented. Note how the object usually does not carry nuclear stress for such complex tenses; this is because such tenses tend to imply that the object is given. In the negative (89b), the light verb takes negation and stress.

- (89) a. (S)<sub>φ</sub> (O)<sub>φ</sub> (Pro V lightV)<sub>φ</sub> ↘  
 mar'ja-n namag-'ner bidi k<sup>h</sup>ə'r-ad z əl'l-a-∅ ↘  
 Maria-DEF letter-PL FUT write-RPTCP be-TH-3SG  
 'Maria will have written some letters.'  
 Մարիան նամակներ պիտի գրած ըլլայ:
- b. (S)<sub>φ</sub> (O)<sub>φ</sub> (Pro V NEG-lightV)<sub>φ</sub> ↘  
 mar'ja-n namag-'ner bidi k<sup>h</sup>ə'r-adz tʃ-əll-a-∅ ↘  
 Maria-DEF letter-PL FUT write-RPTCP NEG-be-TH-3SG  
 'Maria will not have written some letters.'  
 Մարիան նամակներ պիտի գրած չըլլայ:

Pitch-tracks confirm our impressions.

[draw](#)

### 6.5.1.3 Other word orders and function words

The previous examples were mostly all SOV sentences. Other word orders are possible such as OVS. In such sentences however, the negative verb takes stress and causes post-focal deaccenting on all subsequent words. The sentence then ends in a fall.

To illustrate, the sentences below all postpone the subject till the end of the sentence (90). Stress is still on the negated verb. The subject is deaccented and no longer bears perceivable phrasal stress.

- (90) a. (O)<sub>φ</sub> (NEG-V)<sub>φ</sub> (S)<sub>φ</sub> ↘  
 namag-'ner tʃ-un-i-∅ mar'ja-n ↘  
 letter-PL NEG-have-TH-3SG Maria-DEF  
 'Maria does not have letters.'  
 նամակներ չունի Մարիան:
- b. (Adj)<sub>φ</sub> (NEG-Cop)<sub>φ</sub> (S)<sub>φ</sub> ↘  
 gar'mir tʃ-un-i-∅ mar'ja-n ↘  
 red NEG-have-TH-3SG Maria-DEF

‘Maria is not red.’

Կարմիր չունի Մարիան:

- c. (O) (NEG-Aux V)<sub>φ</sub> (S)<sub>φ</sub> ↘  
 namag-**ner** **tʃ-e** kʰəˈr-adz marˈja-n ↘  
 letter-PL NEG-is write-RPTCP Maria-DEF

‘Maria has not written letters.’

Նամակներ չէ գրած Մարիան:

The pitch tracks in () show that the subjects in the above sentences are all deaccented without any prominent pitch. HD however still perceives the lexical stress of these subjects. This perception is likely just a psycholinguistic illusion.

Finally, as a special category, consider negative sentences that include negation-related function words (negative polarity items or NPI) such as ‘any’ [hetʃ] (91). In such sentences, the negative word tends to also require negation on the verb. HD perceives almost equal levels of stress on both the NPI and the negated verb. The verb is higher, but the NPI is also quite high.

- (91) (S)<sub>φ</sub> (NPI O)<sub>φ</sub> (NEG-V)<sub>φ</sub> ↘  
 marˈja-n **hetʃ** naˈmag **tʃ-un-i-Ø** ↘  
 Maria-DEF any letter NEG-have-TH-3SG

‘Maria does not have any letters.’

Մարիան հէջ նամակ չունի:

Acoustically, we find prominence H\* on the NPI and the negated verb. The intervening object looks deaccented.

[draw](#)

### 6.5.2 Polar questions and their answers

The previous section looked at declarative sentences. This section looks at polar questions. Polar questions are also called yes-no questions or interrogatives. These are questions like “Did you read” where the answer is expected to be either a ‘yes’ or ‘no’. In Standard Armenian, a declarative and a polar question are distinguished only by intonation. Some morphological operations are attested in colloquial speech, but they are rather marginal in use; these are discussed in (§6.3.4.3).

Polar questions show the following general properties:

- Nuclear stress: the verb has nuclear stress H\*.
- Final rise: The sentence ends in a rising tone H%.

These properties are found in basic polar questions where the sentence ends in a verb (§6.5.2.1), verbal enclitic, or light verb (§6.5.2.2). Non-final verbs are also stressed and create a high plateau (§6.5.2.3). Negated verbs pattern the same as positives in polar questions (§6.5.2.4). Complications arise though for focused non-verbs (§6.5.2.5) and for questions with the stigmatized question particle (§6.5.2.6) ■

### 6.5.2.1 Basic polar questions with a final lexical verb

We treat a polar question as a ‘basic polar question’ if there’s no special emphasis on the non-verbal words. The question asks where some sentence is true or not. The most basic word order is to make the verb final.

First, consider the basic declarative and polar question below. The sentence is SOV. The declarative (92a) has stress H\* on the object, with a final fall. The polar question (92b) instead places stress H\* on the verb, with a strongly perceptible final rise H%. We use a ? in the top row of (92b) to explicitly represent questions.

- (92) a. (S)<sub>φ</sub>      (O)      (V)<sub>φ</sub>      ↘  
          mar'ja-n    namag-'ner u'n-i-Ø      ↘  
          Maria-DEF letter-PL    have-TH-3SG  
          ‘Maria has some letters.’  
          Մարիան նամակներ ունի:
- b. (S)<sub>φ</sub>      (O)<sub>φ</sub>      (V)<sub>φ</sub>      ? ↗  
          mar'ja-n    namag-'ner u'n-i-Ø      ? ↗  
          Maria-DEF letter-PL    have-TH-3SG  
          ‘Does Maria have some letters?’  
          Մարիան նամակներ ունի՞:

The pitch-tracks in () confirm the presence of the final rise in polar question.  
[draw](#)

For the above polar question (92b), there isn’t contrastive focus on the verb. The verb carries nuclear stress because we are questioning whether the sentence is true or not. To illustrate, a possible answer to this question is to say ‘no’ and then to use either a negated verb (93a) or even a different subject (93b), object (93c), or verb (93d). Nuclear stress is then on the new information (the focused word), and we get a sentence-final fall L%.

- (93) Negative answers to the polar question in (92b)



- a. (No)<sub>φ</sub> (S)<sub>φ</sub> (O)<sub>φ</sub> (NEG-V)<sub>φ</sub> ↘  
 'vot̩, mar'ja-n namag-'ner tʃ-un-i-Ø ↘  
 no, Maria-DEF letter-PL NEG-have-TH-3SG  
 'No, Maria does NOT have letters.'  
 Ոչ, Մարիան նամակներ չունի:
- b. (No)<sub>φ</sub> (S)<sub>φ</sub> (O V)<sub>φ</sub> ↘  
 'vot̩, ara-n namag-'ner u'n-i-Ø ↘  
 no, Ara-DEF letter-PL have-TH-3SG  
 'No, ARA has letters.'  
 Ոչ, Արան նամակներ ունի:
- c. (No)<sub>φ</sub> (S)<sub>φ</sub> (Q V)<sub>φ</sub> ↘  
 'vot̩, mar'ja-n sekan-'ner u'n-i-Ø ↘  
 no, Maria-DEF table-PL have-TH-3SG  
 'No, Maria has TABLES.'  
 Ոչ, Մարիան սեղաններ ունի:
- d. (No)<sub>φ</sub> (S)<sub>φ</sub> (O)<sub>φ</sub> (V)<sub>φ</sub> ↘  
 'vot̩, mar'ja-n namag-'ner dza'x-e-ts-Ø-Ø ↘  
 no, Maria-DEF letter-PL sell-TH-AOR-PST-SG  
 'No, Maria SOLD letters.'  
 Ոչ, Մարիան նամակներ ծախեց:

Acoustically, the pitch-tracks show the presence of a sentence-final L% for these negative answers. The focused word carries stress H\*, and subsequent words are deaccented. Word stress are however still perceivable, probably as an illusion.  
 draw

### 6.5.2.2 Basic polar questions with a final non-lexical verb

In the above sentences, the sentence ended in a simple lexical verb like 'to have'. We saw a perceivable rise H% on this final verb. Matters get more complicated when the final verb is a clitic copula or auxiliary.

First consider the copula cases. In a declarative S-Adj-V sentence (94a), there is stress on the adjective and then a final fall L%. The verb is a cliticized unstressed copula. In contrast in the polar question (94b), there is a sentence-final rise H%.

- (94) a. (S)<sub>φ</sub> (Adj Cop)<sub>φ</sub> ↘  
 mar'ja-n gar'mir =e ↘  
 Maria-DEF red =is

‘Maria is red.’

Մարիան կարմիր է:

- b. (S)<sub>φ</sub>            (Adj    Cop)<sub>φ</sub> ? ↗  
 mar'ja-n    gar'mir =e    ? ↗  
 Maria-DEF    red            =is

‘Is Maria red?’

Մարիան կարմիր ր է:

Impressionistically for the polar question (94b), nuclear stress is on the pre-copula adjective [gar'mir =e] ‘red =is’. This is reflected in the orthography because the question marker<sup>9</sup> is placed on the adjective: կարմիր է <gar'mi'r ē>. Acoustically however, it seems that the sentence-final rise starts in the stressed vowel of the verb [gar'mir] but then only reaches its limit in the final auxiliary. The pitch tracks show this complication.

draw

If the copula is larger, such as being bisyllabic, we again see the same pattern (95a). Impressionistically for the polar question (95b), nuclear stress is on the pre-copula adjective, while the sentence ends in a rise H%.

- (95) a. (S)<sub>φ</sub>            (Adj    Cop)<sub>φ</sub>            ↘  
 dəχak<sup>h</sup>-ə    gar'mir =e-ji-n            ↘  
 boy-PL-DEF    red            =is-PST-3PL

‘The boys were red.’

Տղաքը կարմիր էին:

- b. (S)<sub>φ</sub>            (Adj    Cop)<sub>φ</sub>            ? ↗  
 dəχak<sup>h</sup>-ə    gar'mir =e-ji-n            ? ↗  
 boy-PL-DEF    red            =is-PST-3PL

‘Were the boys red?’

Տղաքը կարմիր էին:

With a longer clitic, we find the same intonational contours. The sentence-final rise starts in the stressed syllable of the pre-copula word. The rise reaches its limit in the clitic.

draw

The same generalizations are again found with complex periphrastic tenses. In (96a), the main verb is a participle while inflection is on a light verb. In the declarative, stress is on the participle. In the polar question as well (96b), we perceive stress on the participle and then a sentence-final rise H%.

- (96) a. (S)<sub>φ</sub> (O)<sub>φ</sub> (Pro V lightV)<sub>φ</sub> ↘  
 mar'ja-n namag-'ner bidi k<sup>h</sup>ə'r-ad z ə'l-a-Ø ↘  
 Maria-DEF letter-PL FUT write-RPTCP be-TH-3SG  
 'Maria will have written some letters.'  
 Մարիան նամակներ պիտի գրած ըլլայ:
- b. (S)<sub>φ</sub> (O)<sub>φ</sub> (Pro V lightV)<sub>φ</sub> ?↗  
 mar'ja-n namag-'ner bidi k<sup>h</sup>ə'r-ad z ə'l-a-Ø ?↗  
 Maria-DEF letter-PL FUT write-RPTCP be-TH-3SG  
 'Will Maria have written some letters?'  
 Մարիան նամակներ պիտի գրած ըլլայ:

The acoustic patterns are again the same. The rise starts in the final syllable of the participle, reaches its peak during the light verb, and stays constant.

draw

### 6.5.2.3 Basic polar questions with a final non-verb

In the previous sentences, the polar question ended in either a verb or a verb-like element such as a copula or light verb. Such SOV constructions are the default ways to form polar questions. However, it is possible to have other word orders such as OVS. In such constructions, nuclear stress stays on the verb, but the sentence-final rise H% continues from the sentence-medial verb all the way to the end of the sentence.

To illustrate, consider the two polar questions below. The default word order (97a) is SOV with a rise on the verb. An alternative word order is OVS (97b). The subject is treated as some type of less important information, such as a afterthought or topic. The stress is still on the verb, and there is still a sentence-final rise.

- (97) a. (S)<sub>φ</sub> (O)<sub>φ</sub> (V)<sub>φ</sub> ?↗  
 mar'ja-n namag-'ner u'n-i-Ø ?↗  
 Maria-DEF letter-PL have-TH-3SG  
 'Does Maria have some letters?'  
 Մարիան նամակներ ունի:
- b. (O)<sub>φ</sub> (V)<sub>φ</sub> (S)<sub>φ</sub> ?↗  
 namag-'ner u'n-i-Ø mar'ja-n ?↗  
 letter-PL have-TH-3SG Maria-DEF  
 'Does Maria have some letters?'  
 Նամակներ ունի՞ Մարիան:

Acoustically, we find an interesting pattern for the OVS question (97b). The rise starts on the verb's final syllable. The pitch reaches its peak by the beginning of the post-verbal word. The pitch then stays high until the end of the sentence. Because of this high plateau, HD perceives that there is no phrasal stress after the focused word; lexical stress is recoverable via just knowing the word.

draw

The continuation of the rise from the verb till the end does not care about lexical stress. For example, in the polar questions below, the subject has penultimate lexical stress because it has a final schwa (98a). In the OVS polar question (98b), the rise continues from the verb till the end of the sentence, even into the schwa.

- (98) a. (S)<sub>φ</sub>            (O)<sub>φ</sub>            (V)<sub>φ</sub>            ?↗  
           mar'jam-ə    namag-'ner u'n-i-Ø        ?↗  
           Mariam-DEF letter-PL    have-TH-3SG  
           'Does Mariam have some letters?'  
           Մարիամը նամակներ ունի՞:
- b. (O)<sub>φ</sub>            (V)<sub>φ</sub>            (S)<sub>φ</sub>            ?↗  
           namag-'ner u'n-i-Ø        mar'jam-ə        ?↗  
           letter-PL    have-TH-3SG Mariam-DEF  
           'Does Mariam have some letters?'  
           Նամակներ ունի՞ Մարիամը:

The pitch-tracks again confirm this impression. For the OVS question (98b), the subject has perceived non-final lexical stress, but there are no pitch differences in the word at all. The perception of lexical stress is thus likely just an illusion.

draw

In the above sentences, the verb phrase consists of just an object and a lexical verb. If the verb is a clitic copula, we again find the same patterns. S-Adj-V is the typical order (99a), but Adj-V-S is possible. For the Adj-V-S order (99b), again stress is on the pre-copula word. The sentence-final rise starts from the final syllable of this word and continues to the final syllable.

- (99) a. (S)<sub>φ</sub>            (Adj    Cop)<sub>φ</sub> ?↗  
           mar'jam-ə    gar'mir =e        ?↗  
           Mariam-DEF red        =is  
           'Is Mariam red?'  
           Մարիամը կարմիր է:

- b. (Adj Cop)<sub>φ</sub> (S)<sub>φ</sub> ? ↗  
     gar'mir =e mar'jam-ə ? ↗  
     red =is Mariam-DEF  
     ‘Is Mariam red?’  
     Կարմիր է Մարիամը:

The pitch-tracks again confirm this impression.

[draw](#)

#### 6.5.2.4 Basic polar questions with negation

The previous polar questions all had the verb in the positive. When the verb is negative, we find similar patterns in terms of nuclear stress and final stress. Basically, the negated verb attracts nuclear stress, and the sentence-final rise starts in this negative verb and continues till the end of the sentence. However, sometimes we find that the negated verb severely weakens or deaccents the subsequent words.

First consider a basic SOV sentence with a negated verb. In both the declarative (100a) and polar question forms (100b), nuclear stress is on the negated verb. The declarative has a final fall, while the polar question has a final rise.

- (100) a. (S)<sub>φ</sub> (O)<sub>φ</sub> (NEG-V)<sub>φ</sub> ↘  
           mar'ja-n namag-'ner tʃ-un-i-Ø ↘  
           Maria-DEF letter-PL NEG-have-TH-3SG  
           ‘Maria does not have letters.’  
           Մարիան նամակներ չունի:
- b. (S)<sub>φ</sub> (O)<sub>φ</sub> (NEG-V)<sub>φ</sub> ? ↗  
           mar'ja-n namag-'ner tʃ-un-i-Ø ? ↗  
           Maria-DEF letter-PL NEG-have-TH-3SG  
           ‘Does Maria not have letters?’  
           Մարիան նամակներ չունի՞:

Impressionistically, the lexical stress of the negated verb is on the first syllable. But acoustically for the polar question, the final rise of the sentence is quite more significant than the prominence of the first syllable.

[draw](#)

The intonational contours are the same if we have a post-verbal element. In an OVS polar question (101), the negated verb still has nuclear stress with a significant rise, and we again have a sentence-final rise. Again, there is no prominent phrasal stress after the negated verb.

- (101) a. (O)<sub>φ</sub>                      (NEG-V)<sub>φ</sub>                      (S)<sub>φ</sub>                      ?↗  
 namag-'ner tʃ-un-i-Ø                      mar'ja-n                      ?↗  
 letter-PL                      NEG-have-TH-3SG Maria-DEF  
 'Does Maria not have letters?'  
 Նամակներ չունի՞ Մարիան:
- b. (O)<sub>φ</sub>                      (NEG-V)<sub>φ</sub>                      (S)<sub>φ</sub>                      ?↗  
 namag-'ner tʃ-un-i-Ø                      mar'jam-ə                      ?↗  
 letter-PL                      NEG-have-TH-3SG Mariam-DEF  
 'Does Mariam not have letters?'  
 Նամակներ չունի՞ Մարիամը:

The pitch-tracks illustrate this contour. The rise starts on the negated verb and continues till the end. However, HD perceives that the subject is rather quiet or low in amplitude. For polar questions, HD perceived that a post-verbal subject is quieter after a negative verb than after a positive verb. We call this quieting effect 'post-negative weakening'. It's unclear if this post-negative weakening is a true acoustic process (and a type of post-focal deaccenting), vs. just an illusion triggered by knowing the semantic significance of negation.

Similar contours are also found with non-lexical verbs. Consider S-Adj-V (102a) and Adj-V-S (102b) polar questions with a negated copula. We likewise include an Adj-V-S sentence with a final schwa (102c) for easier contrast later. All versions have stress on the negated copula, and a sentence-final rise.

- (102) a. (S)<sub>φ</sub>                      (Adj)<sub>φ</sub>                      (NEG-Cop)<sub>φ</sub>                      ?↗  
 mar'ja-n                      gar'mir tʃ-e                      ?↗  
 Maria-DEF red                      NEG-is  
 'Isn't Maria red?'  
 Մարիան կարմիր չէ՞:
- b. (Adj)<sub>φ</sub>                      (NEG-Cop)<sub>φ</sub>                      (S)<sub>φ</sub>                      ?↗  
 gar'mir tʃ-e                      mar'ja-n                      ?↗  
 red                      NEG-is                      Maria-DEF  
 'Isn't Maria red?'  
 Կարմիր չէ՞ Մարիան:
- c. (Adj)<sub>φ</sub>                      (NEG-Cop)<sub>φ</sub>                      (S)<sub>φ</sub>                      ?↗  
 gar'mir tʃ-e                      mar'jam-ə                      ?↗  
 red                      NEG-is                      Mariam-DEF  
 'Isn't Mariam red?'  
 Կարմիր չէ՞ Մարիամը:

The pitch-tracks in () show that this rise starts from the negated copula up until the end of the sentence. The continuous rise and high plateau cause the loss of phrasal stresses after the negated verb.

draw

Periphrastic tenses further show this consistent pattern. In (103a), the verb phrase is made up of a negated auxiliary and a participle. As a polar question, stress is on the negated auxiliary and there is a final rise. The final word is usually the participle, but we can also have a post-posed subject (103b).

- (103) a. (S)<sub>φ</sub> (O) (NEG-Aux V)<sub>φ</sub> ?↗  
 mar'ja-n namag-'ner tʃ-e kʰə'r-ɑdʒ ?↗  
 Maria-DEF letter-PL NEG-is write-RPTCP  
 'Hasn't Maria written letters?'  
 Մարիան նամակներ չէ գրած:
- b. (O) (NEG-Aux V)<sub>φ</sub> (S)<sub>φ</sub> ?↗  
 namag-'ner tʃ-e kʰə'r-ɑdʒ mar'ja-n ?↗  
 letter-PL NEG-is write-RPTCP Maria-DEF  
 'Hasn't Maria written letters?'  
 Նամակներ չէ գրած Մարիան:

The intonational of these sentences is the same as before. We see a rise from the auxiliary onto the final verb. The high plateau causes the loss of any subsequent phrasal prominence.

draw

### 6.5.2.5 Contrastive polar questions

The previous sections focused on polar questions where the entire sentence was being questioned. In contrast, what we call a 'contrastive polar question' is when some specific word in the sentence is being questioned. Such questions are like English 'Did you read the BOOK?' where we question whether a book was read vs. some other entity.

For Armenian, we can create a contrastive polar question by questioning any word, such as the subject or object. The questioned word gets a significant rise. After this word, the pitch continues to rise until the end of the sentence. Sometimes the final syllable of the sentence also has a rise, but sometimes the final syllable has a fall.

idk whats the most common term for this

First consider subject focus. The subject can have lexical stress on the last syllable (104a), or even on the penultimate syllable if the word ends in a schwa (104b). The polar question enhances the lexical stress of the subject, and we have a high rising plateau after this word.

- (104) a. (S)<sub>φ</sub> (O V)<sub>φ</sub> ?↗  
 mar'ja-n namag-'ner u'n-i-Ø ?↗  
 Maria-DEF letter-PL have-TH-3SG  
 'Does Maria have letters (as opposed to someone else).'  
 Մարիամն նամակներ ունի:
- b. (S)<sub>φ</sub> (O V)<sub>φ</sub> ?↗  
 mar'jam-ə namag-'ner u'n-i-Ø ?↗  
 Mariam-DEF letter-PL have-TH-3SG  
 'Does Mariam have letters (as opposed to someone else).'  
 Մարիամը նամակներ ունի:

The pitch-tracks confirm this impression. The rise starts rather late in the stressed syllable of the subject, before any schwa. The rise continues up until the end of the sentence. The post-subject sentences seem to have equivalent levels of prominence (a high plateau), thus we don't mark any phrasal stresses after the subject.

draw

Sometimes, HD would keep the rise on the final syllable, but he would also sometimes have a fall on the final syllable. Such a final fall was also attested in Toparlak & Dolatian (2022). For HD, the use of a final rise seems more common; in contrast, Toparlak & Dolatian (2022)'s consultants seem to prefer a final fall.

draw

Similar patterns arise for object focus. The object has lexical stress on the right-most non-schwa: final in (105a), non-final in (105b). When questioned, this syllable is enhanced and we hear rising intonation.

- (105) a. (S)<sub>φ</sub> (O V)<sub>φ</sub> ?↗  
 mar'ja-n namag-'ner u'n-i-Ø ?↗  
 Maria-DEF letter-PL have-TH-3SG  
 'Does Maria have letters (as opposed to something else).'  
 Մարիան նամակներ ունի:



- b. (S)<sub>φ</sub>      (O                      V)<sub>φ</sub>                      ? ↗  
          mar'ja-n    namag-'ner-ə    u'n-i-∅                      ? ↗  
          Maria-DEF   letter-PL-DEF   have-TH-3SG  
          'Does Maria have the letters (as opposed to something else).'

Մարիան նամակներ ըն ունի:

The pitch-tracks again confirm this impression.

[draw](#)

#### 6.5.2.6 Polar questions with the question particles

The previous examples were all polar questions as formed in standard speech. The most typical constructions are to simply modify the intonation of the sentence, without adding any new question morphemes. This section looks at some question morphemes that are sometimes used.

In standard speech, there are some words that function as question particles like [art<sup>h</sup>jok<sup>h</sup>] 'perhaps' (106). This particle often has irregular stress on the first syllable. This particle is generally restricted to the beginning of the sentence. But this particle is not often used. Furthermore, even when it is used, it does not change the intonational contour of the question.

- (106) (Q)<sub>φ</sub>    (S)<sub>φ</sub>                      (O)<sub>φ</sub>                      (V)<sub>φ</sub>                      ? ↗  
          'art<sup>h</sup>jok<sup>h</sup>   mar'ja-n    namag-'ner    u'n-i-∅                      ? ↗  
          perhaps   Maria-DEF   letter-PL                      have-TH-3SG  
          'Perhaps does Maria have letters?'

Արդեօք Մարիան նամակներ ունի:

The pitch tracks show that there is some rise on this sentence-initial particle, but then the sentence has the typical sentence-final rise.

[draw](#)

In colloquial speech, speakers sometimes use the question particle *ma*. This morpheme is quite stigmatized because it borrowed from Turkish. See §5.2 and §6.1.1 for data on how this morpheme is a clitic.

In polar questions, this particle tends to be restricted to the sentence-final position. In an SOV polar question, the absence of this particle triggers a sentence-final rise (107a). But in contrast, the presence of this particle greatly weakens this final rise (107b). This final rise is close to a sentence-final fall or perhaps just a level tone –. We're not sure.

- (107) a. (S)<sub>φ</sub> (O)<sub>φ</sub> (V)<sub>φ</sub> ?↗  
 mar'ja-n namag-'ner u'n-i-Ø ?↗  
 Maria-DEF letter-PL have-TH-3SG  
 'Does Maria have letters?'  
 Մարիան նամակներ ունի՞:
- b. (S)<sub>φ</sub> (O)<sub>φ</sub> (V) Q)<sub>φ</sub> ?-  
 mar'ja-n namag-'ner u'n-i-Ø =mə ?-  
 Maria-DEF letter-PL have-TH-3SG =Q  
 'Does Maria have letters?'  
 Մարիան նամակներ ունի՞ մը:

Nuclear stress is on the verb in both sentences above. But the pitch-tracks in () show that there is a stark difference in pitch levels based on the presence or absence of the question particle. Without the particle, the verb has a high rise, but the presence of the particle severely weakens this rise.

Similar weakening is found for SOV sentences with negation. The lack of a question particle triggers a perceptible sentence-final rise (108a). The presence of this particle severely weakens this rise (108b), into perhaps just a level tone.

- (108) a. (S)<sub>φ</sub> (O)<sub>φ</sub> (NEG-V)<sub>φ</sub> ?↗  
 mar'ja-n namag-'ner tʃ-un-i-Ø ?↗  
 Maria-DEF letter-PL NEG-have-TH-3SG  
 'Doesn't Maria have letters?'  
 Մարիան նամակներ չունի՞:
- b. (S)<sub>φ</sub> (O)<sub>φ</sub> (NEG-V) Q)<sub>φ</sub> ?-  
 mar'ja-n namag-'ner tʃ-un-i-Ø =mə ?-  
 Maria-DEF letter-PL NEG-have-TH-3SG Q  
 'Doesn't Maria have letters?'  
 Մարիան նամակներ չունի՞ մը:

The pitch-tracks in () again show that the presence of this question particle weakens the final pitch rise.

For space, we do not go through every possible syntactic construction that can use this question particle. Essentially any polar question can be modified to include this particle. Because this particle is stigmatized, it is difficult to know if HD's use of a weakened final rise is a general characteristic of this particle *across* speakers, or if there is significant inter-speaker variability. What makes matters more difficult is that speakers consciously avoid using this particle because of

social stigma. Such stigma would prevent eliciting the relevant data from speakers, and it likewise lowers the chance of finding this particle in recorded natural speech.

### 6.5.3 Wh-questions and focused answers

This section looks at wh-questions, which are questions that use wh-words or question words like ‘Who are you?’. These questions show the following properties:

- Nuclear stress: The wh-word gets nuclear stress H\*.
- Post-focal deaccenting: After the wh-word, all words lose their stress.
- Final rise: The sentence ends in a final rise H%.

The answer sentence to a wh-questions shows the first two properties (stress and post-focal deaccenting). The answers end in a final fall L%.

We go over subject wh-questions (§6.5.3.1) and object-questions (§6.5.3.2). However, we did find some possible length restrictions on the final rise (§6.5.3.3).

#### 6.5.3.1 Subject questions

In a subject wh-question (109), the subject of the sentence is an interrogative pronoun ‘who’ [ov]. The question places nuclear stress on the wh-word, and then we have a sentence-final rise.

- (109) (who)<sub>ϕ</sub> (O                      V)<sub>ϕ</sub>                      ?↗  
           ov        namag-**ner** u'n-i-∅                      ?↗  
           who     letter-PL     have-TH-3SG  
           ‘Who has letters?’  
           ո՞վ նամակներ ունի:

Acoustically, in the question, the stress on the wh-word causes the loss of stress in all subsequent words. This process of post-focal deaccenting is quite robust. The final syllable of the sentence is unstressed and gets a sentence-final rise H%.

[draw](#)

In the corresponding answer, stress is on the subject, and we end in a sentence-final fall. For contrast, we show two possible subjects: one with final stress (110a) and with penultimate stress (110b).

- (110) a. (S)<sub>φ</sub> (O V)<sub>φ</sub> ↘  
mar'ja-n namag-'ner u'n-i-∅ ↘  
 Maria-DEF letter-PL have-TH-3SG  
 'Maria has letters.'  
 Մարիան նամակներ ունի:
- b. (S)<sub>φ</sub> (O V)<sub>φ</sub> ↘  
mar'jam-ə namag-'ner u'n-i-∅ ↘  
 Mariam-DEF letter-PL have-TH-3SG  
 'Mariam has letters.'  
 Մարիամը նամակներ ունի:

In the answer to this question, post-focal deaccenting applies after the subject, and we get a final fall L%. Nuclear stress is on the stressed syllable of the subject, regardless of that syllable is final or non-final.

draw

The above wh-question shows three basic components for subject questions: stress on the subject, post-focal deaccenting, and a sentence-final rise. It seems these properties are consistent across all possible subject wh-questions.

For example, consider a subject wh-question that ends in a clitic verb (111a). Stress is on the subject as expected, and there is a sentence-final rise. This rise is on the clitic even though the clitic doesn't bear lexical stress.

- (111) a. (who)<sub>φ</sub> (Adj V)<sub>φ</sub> ? ↗  
'ov gar'mir =e ? ↗  
 who red =is  
 'Who is red?'  
 Ո՞վ կարմիր է:
- b. (S)<sub>φ</sub> (O V)<sub>φ</sub> ↘  
mar'ja-n gar'mir =e ↘  
 Maria-DEF red =is  
 'Maria is red.'  
 Մարիան կարմիր է:
- c. (S)<sub>φ</sub> (O V)<sub>φ</sub> ↘  
mar'jam-ə gar'mir =e ↘  
 Mariam-DEF red =is  
 'Mariam is red.'  
 Մարիամը կարմիր է:

The pitch-tracks show that the sentence-final rise of the question starts on the final syllable, even though it is a clitic without lexical stress. Both the question and answers (111b, 111c) have stress on the subject, followed by post-focal deaccenting.

draw

Periphrastic tenses show the same intonational contours (112). The sentence ends in a verb plus clitic, yet we see a sentence-final rise in the question (112a).

- (112) a. (who)<sub>φ</sub> (O                      V                      Aux)<sub>φ</sub> ? ↗  
           'ov      namag-'ner k<sup>h</sup>ə'r-əďz      =e      ? ↗  
           who    letter-PL    write-RPTCP =is  
           'Who has written letters?'  
           Ո՞վ նամակներ գրած է:
- b. (S)<sub>φ</sub>                      (O                      V                      Aux)<sub>φ</sub> ↘  
           mar'ja-n      namag-'ner k<sup>h</sup>ə'r-əďz      =e      ↘  
           Maria-DEF letter-PL    write-RPTCP =is  
           'Maria has written letters.'  
           Մարիան նամակներ գրած է:
- c. (S)<sub>φ</sub>                      (O                      V                      Aux)<sub>φ</sub> ↘  
           mar'jam-ə      namag-'ner k<sup>h</sup>ə'r-əďz      =e      ↘  
           Mariam-DEF letter-PL    write-RPTCP =is  
           'Mariam has written letters.'  
           Մարիամը նամակներ գրած է:

In the corresponding answers, nuclear stress is on the stressed syllable of the subject, followed by post-focal deaccenting, and then finally a sentence-final fall L%.

draw

Larger periphrastic structures again show the same intonation. In (113), the verb phrase consist of a proclitic, verb, and a light verb. In both the question and answer, the subject gets focus, subsequent words lose prominence, and there is a sentence-final rise.

- (113) a. (who)<sub>φ</sub> (O)<sub>φ</sub>                      (Pro V                      lightV)<sub>φ</sub> ? ↗  
           'ov      namag-'ner bidi k<sup>h</sup>ə'r-əďz      əl'l-α-Ø      ? ↗  
           who    letter-PL    FUT write-RPTCP be-TH-3SG  
           'Who will have written letters?'  
           Ո՞վ նամակներ պիտի գրած էլլալ:

- b. (S)<sub>φ</sub> (O)<sub>φ</sub> (Pro V lightV)<sub>φ</sub> ↘  
mar'ja-n namag-'ner bidi k<sup>h</sup>ə'r-adz ə'l'l-a-Ø ↘  
 Maria-DEF letter-PL FUT write-RPTCP be-TH-3SG  
 'Maria will have written letters.'  
 Մարիան նամակներ պիտի գրած ելլայ:
- c. (S)<sub>φ</sub> (O)<sub>φ</sub> (Pro V lightV)<sub>φ</sub> ↘  
mar'jam-ə namag-'ner bidi k<sup>h</sup>ə'r-adz ə'l'l-a-Ø ↘  
 Mariam-DEF letter-PL FUT write-RPTCP be-TH-3SG  
 'Mariam will have written letters.'  
 Մարիամը նամակներ պիտի գրած ելլայ:

Acoustically, the pitch-tracks show that the final rise in the wh-question is strictly limited to the final syllable. The answers have a sentence-final fall. Both questions and answers have post-focal deaccenting after the subject.

draw

### 6.5.3.2 Object questions

Object wh-questions show similar intonational properties as subject wh-questions. First, nuclear stress is on the object, then we have post-focal deaccenting, and the sentence ends a final-rise on the final syllable.

First consider basic SOV sentences (114). In both the question and answer form, the object gets stress, and the verb is deaccented. The question has a final rise while the declarative answer has a final fall.

- (114) a. (S)<sub>φ</sub> (what V)<sub>φ</sub> ?↗  
mar'ja-n 'intʃ u'n-i-Ø ?↗  
 Maria-DEF what have-TH-3SG  
 'What does Maria have?'  
 Մարիան ի՞նչ ունի:
- b. (S)<sub>φ</sub> (O V)<sub>φ</sub> ↘  
mar'ja-n namag-'ner u'n-i-Ø ↘  
 Maria-DEF letter-PL have-TH-3SG  
 'Maria has letters.'  
 Մարիան նամակներ ունի:
- c. (S)<sub>φ</sub> (O V)<sub>φ</sub> ↘  
mar'ja-n namag-'ner-ə u'n-i-Ø ↘  
 Maria-DEF letter-PL-DEF have-TH-3SG

‘Maria has the letters.’

Մարիան նամակները ունի:

For the answers, nuclear stress is on the stressed syllable of the object. This syllable can be final (114b) or non-final (114c). The pitch-tracks show all these properties.

draw

Unlike subject wh-questions, object wh-questions allow more flexibility in their syntax. For example, the above sentences are SOV, but OVS orders are also possible (115). In such constructions, stress is still on the object, and there is still a rise on the final syllable.

- (115) a. (what V)<sub>φ</sub> (S)<sub>φ</sub> ? ↗  
           intj u'n-i-∅ mar'jam-ə ? ↗  
           what have-TH-3SG Mariam-DEF  
           ‘What does Mariam have?’  
           Ի՞նչ ունի Մարիամը:
- b. (what V)<sub>φ</sub> (S)<sub>φ</sub> ? ↗  
           intj u'n-i-∅ mar'ja-n ? ↗  
           what have-TH-3SG Maria-DEF  
           ‘What does Maria have?’  
           Ի՞նչ ունի Մարիան:
- c. (O V)<sub>φ</sub> (S)<sub>φ</sub> ↘  
           namag-ner u'n-i-∅ mar'ja-n ↘  
           letter-PL have-TH-3SG Maria-DEF  
           ‘Maria has letters.’  
           Նամակներ ունի Մարիան:

Acoustically, we again find post-focal deaccenting after the object. This deaccenting causes the loss of phrasal prominence, but we can still perceive lexical stresses (probably just an illusion). The final syllable of the sentence gets a rise H%, regardless if that syllable has lexical stress (115b) or not (115a) (= is or isn’t a schwa).

draw

Longer sentences can be formed with periphrastic tenses (116). In the sentences below, the verb phrase has proclitic, verb, and light verb. The SOV order creates a long sequence of deaccenting words after the focused object.

- (116) a. (S)<sub>φ</sub> (what)<sub>φ</sub> (Pro V lightV)<sub>φ</sub> ?↗  
 mar'ja-n 'intf bidi kʰə'r-ədʒ əl'l-a-Ø ?↗  
 Maria-DEF what FUT write-RPTCP be-TH-3SG  
 'What will Maria have written?'  
 Մարիան ի՞նչ պիտի գրած ըլլայ:
- b. (S)<sub>φ</sub> (O)<sub>φ</sub> (Pro V lightV)<sub>φ</sub> ↘  
 mar'ja-n namag-'ner bidi kʰə'r-ədʒ əl'l-a-Ø ↘  
 Maria-DEF letter-PL FUT write-RPTCP be-TH-3SG  
 'Maria will have written letters.'  
 Մարիան նամակներ պիտի գրած ըլլայ:
- c. (S)<sub>φ</sub> (O)<sub>φ</sub> (Pro V lightV)<sub>φ</sub> ↘  
 mar'ja-n namag-'ner-ə bidi kʰə'r-ədʒ əl'l-a-Ø ↘  
 Maria-DEF letter-PL-DEF FUT write-RPTCP be-TH-3SG  
 'Maria will have written the letters.'  
 Մարիան նամակները պիտի գրած ըլլայ:

Acoustically, nuclear stress is realized as a pitch rise on the stressed syllable of the object, regardless if that syllable is word-final (116b) or not (116c). We then find deaccenting. The question ends in a final rise, while the answer in a fal fall.

Such periphrastic tenses can be reverted to an OVS form (117). Again, such inversion does not affect the intonation. The object gets stressed, subsequent words get deaccented, and the sentence-final syllable gets a rise in the question while a fall in the answer.

- (117) a. (what)<sub>φ</sub> (Pro V lightV)<sub>φ</sub> (S)<sub>φ</sub> ?↗  
 'intf bidi kʰə'r-ədʒ əl'l-a-Ø mar'jam-ə ?↗  
 what FUT write-RPTCP be-TH-3SG Mariam-DEF  
 'What will Mariam have written?'  
 Ի՞նչ պիտի գրած ըլլայ Մարիամը:
- b. (what)<sub>φ</sub> (Pro V lightV)<sub>φ</sub> (S)<sub>φ</sub> ?↗  
 'intf bidi kʰə'r-ədʒ əl'l-a-Ø mar'ja-n ?↗  
 what FUT write-RPTCP be-TH-3SG Maria-DEF  
 'What will Maria have written?'  
 Ի՞նչ պիտի գրած ըլլայ Մարիան:
- c. (O)<sub>φ</sub> (Pro V lightV)<sub>φ</sub> (S)<sub>φ</sub> ↘  
 namag-'ner bidi kʰə'r-ədʒ əl'l-a-Ø mar'ja-n ↘  
 letter-PL FUT write-RPTCP be-TH-3SG Maria-DEF



‘Maria will have written letters.’

Նամակներ պիտի գրած ըլլայ Մարիան:

Pitch-tracks again confirm these impressions. The focused object has a prominent rise, followed by a post-focal deaccenting on all subsequent words. The question has a final rise on the sentence-final syllable.

draw

### 6.5.3.3 Distance restrictions on final rises

All the above sentences had multiple syllables after focused word. These syllables were part of at least one lexical word. The sentence was long enough to easily allow a rise on the focused word, and then a rise on the final syllable. However, when only one syllable (a clitic) follows the object focus, HD tends to not have any rise on this final syllable.

To illustrative, consider SOV sentences where the verb is a clitic copula (118a).

- (118) a. (S)<sub>φ</sub> (who Cop)<sub>φ</sub> ? ↗  
 mar'jam-ə 'ov =e ? ↗  
 Mariam-DEF who =is  
 ‘Who is Mariam?’  
 Մարիամը ո՞վ է:
- b. (who Cop)<sub>φ</sub> (S)<sub>φ</sub> ? ↗  
 'ov =e mar'jam-ə ? ↗  
 who =is Mariam-DEF  
 ‘Who is Mariam?’  
 Ո՞վ է Մարիամը:

The pitch-tracks show that the object has prominence. But for the SOV question (118a), the final clitic seems to have no prominence at all, not even a final rise. HD still perceives a sentence-final rise, but this rise may actually be anchored onto the non-final wh-word instead. The lack of a sentence-final rise may be because this clitic is too close to the focused object. In contrast, the OVS sentence (118b) shows a sentence-final rise.

When the clitic is longer, it seems that is then easier to create a sentence-final rise. Consider the sentences in (119).

- (119) a. (S)<sub>φ</sub> (who Cop)<sub>φ</sub> ? ↗  
dəx'ak<sup>h</sup>-ə 'ov =e-ji-n ? ↗  
boy-PL-DEF who =is-PST-3PL  
'Who were the boys?'  
Տղաքը ո՞վ էին:
- b. (who Cop)<sub>φ</sub> (S)<sub>φ</sub> ? ↗  
'ov =e-ji-n dəx'ak<sup>h</sup>-ə ? ↗  
who =is-PST-3PL boy-PL-DEF  
'Who were the boys?'  
Ո՞վ էին տղաքը:

The pitch-tracks show a sentence-final rise in both the SOV and OVS orders.

#### 6.5.4 Summary of focus intonation and cross-dialectal differences

write after recordings in later stages

, or negated verb. Complications In the base case, the verb is final stressed syllable of the sentence (§6.5.2.1). Here,  $H^*$  and  $H\%$  are the same. But there are cases where the verb is a final unstressed clitic or an unstressed light verb (§6.5.2.2). In this case, stress  $H^*$  is on the final stressable syllable, and we see a continuous rise from that syllable until the end of the sentence.

If the verb is non-final as in OVS (§6.5.2.3, the verb still gets stress H\*. The rise H% starts from the verb and continues till the end of the sentence.

All these patterns are generally the same when the verb is negated (§6.5.2.4), though there may be some level of post-focal deaccenting.

When a non-verb is focused in a polar question (§6.5.2.5, that non-verb gets stress H\*, and then we see a high plateau. The sentence ends in a rise H% for HD but there is variation.

## 6.6 Prosodic structure of other syntactic structures

This section goes over the intonation of syntactic structures that don't easily fit into the previous sections and their categories. These constructions are subjunctive clauses with the clitic *=ne* (§6.6.1), relative clauses with extraposition (§6.6.2), imperatives (§6.6.3), and vocatives (§6.6.4).

### 6.6.1 Subjunctive clauses and the subjunctive clitic

In a subjunctive or subordinate clause, the subjunctive clitic =*ne* is optional but its presence triggers special intonational effects. See §5.2 and §6.1.1 for data on how this morpheme is a clitic.

For a subordinate clause like an ‘if-clause’, the clause can end with (120b) or without (120a) the subjunctive marker =*ne* after the verb. The two sentences are synonymous, but they have different intonational effects on the first verb. We underline and mark the word with the most prominent stress in the if-clause.

- (120) a.  $\text{jet}^{\text{h}}\text{e } \underline{\text{jer}}^{\text{t}^{\text{h}}}\text{-}\alpha\text{-n, } \text{ur}\alpha\chi \text{ g-}\alpha\text{ll-}\alpha\text{-n}$   
           if    go-TH-3PL, happy IND-be-TH-3PL  
           ‘If they go, they’ll be happy.’  
           Եթէ երթան, ուրախ կ’ըլլան:
- b.  $\text{jet}^{\text{h}}\text{e } \underline{\text{jer}}^{\text{t}^{\text{h}}}\text{-}\alpha\text{-n } =\text{ne, } \text{ur}\alpha\chi \text{ g-}\alpha\text{ll-}\alpha\text{-n}$   
           if    go-TH-3PL =SBJV, happy IND-be-TH-3PL  
           ‘If they go, they’ll be happy.’  
           Եթէ երթան նէ, ուրախ կ’ըլլան:

Essentially, whenever the =*ne* is added, the preceding syllable is perceivably more prominent (120b) than when the =*ne* is absent (120a). The syllable has a perceivably higher pitch.

draw

If the if-clause has an object, the object typically gets stress (121a). If the =*ne* is added (121b), then stress visibly shifts to the verbal syllable that precedes the =*ne*.

- (121) a.  $\text{jet}^{\text{h}}\text{e } \underline{\text{'dun}} \text{ jer}^{\text{t}^{\text{h}}}\text{-}\alpha\text{-n, } \text{ur}\alpha\chi \text{ g-}\alpha\text{ll-}\alpha\text{-n}$   
           if    home go-TH-3PL, happy IND-be-TH-3PL  
           ‘If they go home, they’ll be happy.’  
           Եթէ տուն երթան, ուրախ կ’ըլլան:
- b.  $\text{jet}^{\text{h}}\text{e } \text{dun } \underline{\text{jer}}^{\text{t}^{\text{h}}}\text{-}\alpha\text{-n } =\text{ne, } \text{ur}\alpha\chi \text{ g-}\alpha\text{ll-}\alpha\text{-n}$   
           if    home go-TH-3PL =SBJV, happy IND-be-TH-3PL  
           ‘If they go home, they’ll be happy.’  
           Եթէ տուն երթան նէ, ուրախ կ’ըլլան:

The shift in prominence is visible from the pitch-tracks.

draw

The subjunctive clitic *=ne* quite regularly shifts stress to its preceding syllable. For example, the progressive clitic *=gor* is typically unstressed (122a). But if the progressive is before the subjunctive (122b), then the progressive gets stress.

- (122) a.  $\text{jet}^{\text{h}}\text{e } \underline{\text{g-er}^{\text{h}}\text{-a-n}} \quad =\text{gor}, \quad \text{urax} \quad \text{g-əll-a-n}$   
           if  $\text{IND-go-TH-3PL} =\text{PROG}, \text{happy IND-be-TH-3PL}$   
           ‘If they are going, they’ll be happy.’  
           Եթէ կ’երթան կոր, ուրախ կ’լլան:
- b.  $\text{jet}^{\text{h}}\text{e } \text{gert}^{\text{h}}\text{-a-n} \quad \underline{=\text{gor}} \quad =\text{ne}, \quad \text{urax} \quad \text{g-əll-a-n}$   
           if  $\text{IND-go-TH-3PL} \underline{=\text{PROG}} =\text{SBJV}, \text{happy IND-be-TH-3PL}$   
           ‘If they are going, they’ll be happy.’  
           Եթէ կ’երթան կոր նէ, ուրախ կ’լլան:

Again the pitch-tracks show this shift in pitch prominence.

[draw](#)

Unfortunately, the subjunctive marker *=ne* is quite stigmatized yet common in colloquial speech. This makes it difficult to easily elicit data on the marker. It is an open question if this shift in prominence is because the marker induces semantic focus on the preceding word, or if this is merely a lexical idiosyncrasy of this marker.

## 6.6.2 Relative clauses and extraposition

We go over the basic prosodic structure of relative clauses. A major property of such clauses is that they are obligatorily extraposed if a) the head noun is preverbal, and b) the head noun is in the same prosodic phrase as the verb. We first provide a brief overview of the phenomenon (§6.6.2.1), then we catalog contexts for extraposition from objects (§6.6.2.2) and subjects (§6.6.2.3). We tease apart phrasing and stress in §6.6.2.4.

### 6.6.2.1 Overview of relative clause prosody and extraposition

Nouns can be modified with relative clauses. Such clauses are pronounced as separate stress domains (123).

- (123) a.  $(\text{N})_{\phi} \quad (\text{that } \text{O} \quad \text{V})_{\phi}$   
            $\text{ga}^{\text{h}}\text{du-mə vor} \quad \text{ba}^{\text{h}}\text{nir-ə} \quad \text{ge}^{\text{h}}\text{r-a-v}$   
           cat-INDF that cheese-DEF eat.AOR-PST-3SG  
           ‘A cat who ate the cheese.’  
           Կատու մը որ պանիրը կերաւ:

- b. (Adj N)<sub>φ</sub> (that O V)<sub>φ</sub>  
 ga'r'mir ga'du-mə vor ba'nir-ə ge'r-a-v  
 red cat-INDF that cheese-DEF eat.AOR-PST-3SG  
 ‘A red cat who ate the cheese.’  
 Կարմիր կատու մը որ պանիրը կերաւ:

We use the term ‘stress domain’ out of agnosticism. It’s not obvious to us if relative clauses are necessarily separate intonational phrases, or if they’re just separate prosodic phrases. We suspect that they’re just separate prosodic phrases. The evidence is that there seems to be a constant decrease or declination in pitch as we move through the sentence. Thus, it does not seem that relative clauses trigger a reset or re-start in pitch levels. More systematic acoustic data is however needed.

draw

Such clauses can be added either directly after the noun, or after an intervening verb. An interesting correlation between stress and relative clauses is extraposition. Consider a transitive (S)OV sentence. If the subject is modified with a relative clause (124a), then the relative clause must be adjacent to the subject. In contrast, if the object is modified (124b), then the object is extraposed or placed after the verb.

- (124) a. (S)<sub>φ</sub> (that O V)<sub>φ</sub> (O V)<sub>φ</sub>  
 ga'du-mə vor ba'nir-ə ge'r-a-v marja'm-i-n χa'dz-a-v  
 cat-INDF that cheese-DEF eat.AOR-PST-3SG Mariam-DAT-DEF bite-PST-3SG

‘A cat who ate the cheese bit Mariam.’  
 Կատու մը որ պանիրը կերաւ Մարիամին խաճաւ:

- b. (O V)<sub>φ</sub> (that O V)<sub>φ</sub>  
 ga'du-mə u'n-i-m vor ba'nir-ə ge'r-a-v  
 cat-INDF have-TH-1SG that cheese-DEF eat.AOR-PST-3SG  
 ‘I have a cat who ate the cheese.’  
 Կատու մը ունիմ որ պանիրը կերաւ:

For such SOV sentences, the subject’s relative clause must be adjacent to the subject (124a). If the relative clause was extraposed to after the verb (125), then the relative clause incorrectly modifies the object.

- (125) # $(S)_\phi$  (O  $V)_\phi$  (that O  $V)_\phi$   
 ga'du-mə marja'm-i-n xa'dz-a-v vor ba'nir-ə ge'r-a-v  
 cat-INDF Mariam-DAT-DEF bite-PST-3SG that cheese-DEF eat.AOR-PST-3SG

Intended: 'A cat who ate the cheese bit Mariam.'

Actual: 'A cat bit Mariam who ate the cheese.'

Կատու մը Մարիամին խաճաւ որ պանիրը կերաւ:

In contrast, if the relative clause modifies the direct object in an SOV sentence, then the relative clause must be extraposed or placed after the verb (124b). If the relative clause was placed next to the noun (126), then there is a connotation that the object is given topicalized information, and there's a significant pause before the main verb.

- (126) (O) $_\phi$  (that O  $V)_\phi$  ( $V)_\phi$   
 ga'du-mə vor ba'nir-ə ge'r-a-v u'n-i-m  
 cat-INDF that cheese-DEF eat.AOR-PST-3SG have-TH-1SG  
 'A cat who ate the cheese, I have.'  
 Կատու մը որ պանիրը կերաւ, ունիմ:

### 6.6.2.2 Extraposition of objects

For direct objects, the need for extraposition seems consistent. Extraposition applies for direct objects with modifiers (127a) and for definite objects (127b).

- (127) a. (Adj O-INDF  $V)_\phi$  (that O  $V)_\phi$   
 gar'mir ga'du-mə u'n-i-m vor ba'nir-ə ge'r-a-v  
 red cat-INDF have-TH-1SG that cheese-DEF eat.AOR-PST-3SG  
 'I have a red cat who ate the cheese.'  
 Կարմիր կատու մը ունիմ որ պանիրը կերաւ:
- b. (O-DEF  $V)_\phi$  (that O  $V)_\phi$   
 ga'du-n u'n-i-m vor ba'nir-ə ge'r-a-v  
 cat-DEF have-TH-1SG that cheese-DEF eat.AOR-PST-3SG  
 'I have the cat who ate the cheese.'  
 Կատուն ունիմ որ պանիրը կերաւ:

Note that the above generalizations are for pre-verbal objects. If the object is post-verbal (128), then no extraposition is needed because the noun and relative clause are already adjacent.

- (128) (V)<sub>φ</sub> (O-INDF)<sub>φ</sub> (that O V)<sub>φ</sub>  
 u'n-i-m ga'du-mə vor ba'nir-ə ge'r-a-v  
 have-TH-1SG cat-INDF that cheese-DEF eat.AOR-PST-3SG  
 'I have a cat who ate the cheese.'  
 Ունիմ կատու մը որ պանիրը կերաւ:

The generalization is that extraposition applies so that the preverbal object and the verb can be parsed into a single prosodic phrase. We see this generalization likewise in ditransitives, where there are two objects (129a). The first object can get a non-extraposed relative clause (129b).

- (129) a. (IO)<sub>φ</sub> (DO V)<sub>φ</sub>  
 də'x-u-mə ga'du-mə dəv-i-Ø  
 boy-DAT-INDF cat-INDF give.AOR-PST-1SG  
 'I gave a cat to a boy.'  
 Տղու մը կատու մը տուի:  
 b. (IO)<sub>φ</sub> (that Adj Cop)<sub>φ</sub> (DO V)<sub>φ</sub>  
 də'x-u-mə vor u'rax =e-Ø-r ga'du-mə dəv-i-Ø  
 boy-DAT-INDF that happy =is-PST-3SG cat-INDF give.AOR-PST-1SG  
 'I gave a cat to a boy who was happy.'  
 Տղու մը որ ուրախ էր, կատու մը տուի:

But the second and immediately preverbal object requires extraposition (130a). If the preverbal object moves its location, then there is no extraposition (130b).

- (130) a. (IO)<sub>φ</sub> (DO V)<sub>φ</sub> (that Adj Cop)<sub>φ</sub>  
 də'x-u-mə ga'du-mə dəv-i-Ø vor gar'mir =e-Ø-r  
 boy-DAT-INDF cat-INDF give.AOR-PST-1SG that red =is-PST-3SG  
 'I gave a cat that is red to a boy.'  
 Տղու մը կատու մը տուի որ կարմիր էր:  
 b. (DO)<sub>φ</sub> (that Adj Cop)<sub>φ</sub> (IO V)<sub>φ</sub>  
 ga'du-mə vor gar'mir =e-Ø-r də'x-u-mə dəv-i-Ø  
 cat-INDF that red =is-PST-3SG boy-DAT-INDF give.AOR-PST-1SG  
 'I gave a cat that is red to a boy.'  
 Կատու մը որ կարմիր էր, տղու մը տուի:

Object wh-questions show obligatory extraposition (131). The object is generally preverbal, it and takes focus. The relative clause is extraposed.

- (131) (S)<sub>φ</sub> (what V)<sub>φ</sub> (that Adj Cop)<sub>φ</sub>  
 də'ʁɑ-n 'intʃ u'n-i-∅ vor gar'mir =e  
 boy-DEF what have-TH-1SG that red =is  
 'What does the boy have that is red?'  
 Տղան ի՞նչ ունի որ կարմիր է:

If the wh-word and relative clause stayed adjacent (132), then the sentence is not easily interpreted as a wh-question. The sentence is instead a declarative and the 'what that' sequence is reinterpreted as a free relative 'whatever'.

- (132) a. (S)<sub>φ</sub> (what)<sub>φ</sub> (that Adj Cop)<sub>φ</sub> (V)<sub>φ</sub>  
 də'ʁɑ-n 'intʃ vor gar'mir =e u'n-i-∅  
 boy-DEF what that red =is have-TH-1SG  
 'The boy has whatever that is read.'  
 Տղան ինչ որ կարմիր է ունի:  
 b. (S)<sub>φ</sub> (V)<sub>φ</sub> (what)<sub>φ</sub> (that Adj Cop)<sub>φ</sub>  
 də'ʁɑ-n u'n-i-∅ 'intʃ vor gar'mir =e  
 boy-DEF have-TH-1SG what that red =is  
 'The boy has whatever that is read.'  
 Տղան ունի ինչ որ կարմիր է :

### 6.6.2.3 Extraposition of subjects

This correlation between prosodic phrasing and extraposition is also found in intransitive subjects. For an unaccusative verb, the norm is that the subject is part of the prosodic phrase of the verb, regardless if the subject is indefinite (133a) or definite (133b). Extraposition is again the norm.

- (133) a. (S V)<sub>φ</sub> (that Adj Cop)<sub>φ</sub>  
 ɡɑ'du-mə je'g-ɑ-v vor gar'mir =e-∅-r  
 cat-INDF come.AOR-PST-3SG that red =is-PST-3SG  
 'A cat came that was red.'  
 Կատու մը եկաւ որ կարմիր էր:  
 b. ɑjt<sup>h</sup> ɡɑ'du-n je'g-ɑ-v vor gar'mir =e-∅-r  
 that cat-DEF come.AOR-PST-3SG that red =is-PST-3SG  
 'That cat came that was red.'  
 Այդ կատուն եկաւ որ կարմիր էր:



Note that the definite form in (133b) includes a demonstrative. Without an additional modifier like a demonstrative, it feels infelicitous to add a relative to the definite subject.

This correlation is clearer in unergatives (134a) and passives (134b). If the subject is indefinite, then it is phrased by the verb and triggers relative clause extraposition.

- (134) a. (S V)<sub>φ</sub> (that Adj Cop)<sub>φ</sub>  
 ga'du-mə va'z-e-t̪s-Ø-Ø vor gar'mir =e-Ø-r  
 cat-INDF run-TH-AOR-PST-3SG that red =is-PST-3SG  
 'A cat ran that was red.'  
 Կատու մը վազեց որ կարմիր էր:  
 b. zin'vor-mə əspannə-v-e-t̪s-a-v vor gar'mir =e-Ø-r  
 soldier-INDF kill-PASS-TH-AOR-PST-3SG that red =is-PST-3SG  
 'A soldier was killed who was red.'  
 Զինուոր մը սպաննուեցաւ որ կարմիր էր:

But for unergatives (135a) and passives (135b), the definite tends to be phrased separately. So extraposition is not needed.

- (135) a. ( S)<sub>ϕ</sub> (that Adj Cop)<sub>ϕ</sub> (V)<sub>ϕ</sub>  
 ajt<sup>h</sup> ga'du-n vor gar'mir =e-Ø-r va'z-e-ts-Ø-Ø  
 that cat-INDF that red =is-PST-3SG run-TH-AOR-PST-3SG  
 'That cat that was red ran.'  
 Այդ կատուն որ կարմիր էր վազեց:
- b. ajt<sup>h</sup> zin'vor-ə vor gar'mir =e-Ø-r əspannə-v-e-ts-a-v  
 that soldier-INDF that red =is-PST-3SG kill-PASS-TH-AOR-PST-3SG  
 'That soldier who was red was killed.'  
 Այդ զինուորոր որ կարմիր էր սպաննուեցաւ:

Adding an extraposed relative clause (136) is either unacceptable or creates the sense of an afterthought.

- (136) a.  $? \#(S \quad V)_{\phi}$  (that Adj Cop) $_{\phi}$   
 aɟtʰ ga'du-n va'z-e-t̃s-Ø-Ø vor gar'mir =e-Ø-r  
 that cat-INDF run-TH-AOR-PST-3SG that red =is-PST-3SG  
 'That cat ran, that was red.'  
 Այդ կատուն վազեց որ կարմիր էր :

- b. ?#ajt<sup>h</sup> zin'vor-ə əspannə-v-e-t̪s-ɑ-v vor gar'mir  
 that soldier-INDF kill-PASS-TH-AOR-PST-3SG that red  
 =e-Ø-r  
 =is-PST-3SG  
 'That soldier was killed, who was red.'  
 Այդ զինուորը սպաննուեցաւ որ կարմիր էր:

In transitive sentences, a SOV order does not allow extraposing a relative clause from the subject (125). But in an OSV order, we can extrapose the relative clause from the subject. Such subject constructions are discussed more in *cite subject incorporation* in the context of subject incorporation.

- (137) (O)<sub>φ</sub> (S V)<sub>φ</sub> (that O V)<sub>φ</sub>  
 marja'm-i-n ga'du-mə χɑ'dz-ɑ-v vor ba'nir-ə ge'r-ɑ-v  
 Mariam-DAT-DEF cat-INDF bite-PST-3SG that cheese-DEF eat.AOR-PST-3SG

'Mariam was bit by a cat who ate the cheese.'  
 Մարիամին կատու մը խածաւ որ պանիրը կերաւ:

#### 6.6.2.4 General role of prosodic phrasing

In all the above sentences, a unifying factor for the extraposition contexts was that a) the noun and verb were in the same prosodic phrase, and b) the noun had phrasal stress. Data from focus show that the first property (prosodic phrasing) is the primary factor behind extraposition. The stress correlations are the effects of such phrasing. For example, consider the wh-question and answer in (138). In these SOV sentences, the subject has focus, while the object is modified with an extraposed relative clause. Subject focus causes deaccenting on all subsequent words (§6.5.3.1).

- (138) a. (S)<sub>φ</sub> (O V)<sub>φ</sub> (that O V)<sub>φ</sub>  
 'ov ga'du-mə u'n-i-Ø vor ba'nir-ə ge'r-ɑ-v  
 who cat-INDF have-TH-3SG that cheese-DEF eat.AOR-PST-3SG  
 'Who has a cat who ate the cheese?'  
 Ո՞վ կատու մը ունի որ պանիրը կերաւ:

- b. (S)<sub>φ</sub> (O V)<sub>φ</sub> (that O V)<sub>φ</sub>  
 mar'ja-n ga'du-mə u'n-i-Ø vor ba'nir-ə ge'r-a-v  
 Maria-DEF cat-INDF have-TH-3SG that cheese-DEF eat.AOR-PST-3SG  
 'Maria has a cat who ate the cheese'  
 Մարիան կատու մը ունի որ պանիրը կերաւ:

Even though the object is unstressed, it still requires extraposition. If the object and clause were adjacent before the verb (139), then that creates a connotation that the object is somehow topicalized, or that the verb has some level of focus.

- (139) a. (S)<sub>φ</sub> (O)<sub>φ</sub> (that O V)<sub>φ</sub> (V)<sub>φ</sub>  
 'ov ga'du-mə vor ba'nir-ə ge'r-a-v u'n-i-Ø  
 who cat-INDF that cheese-DEF eat.AOR-PST-3SG have-TH-3SG  
 'For a cat who ate the cheese, who has it?'  
 Ո՞վ կատու մը որ պանիրը կերաւ ունի:
- b. (S)<sub>φ</sub> (O V)<sub>φ</sub> (that O V)<sub>φ</sub>  
 mar'ja-n ga'du-mə vor ba'nir-ə ge'r-a-v u'n-i-Ø  
 Maria-DEF cat-INDF that cheese-DEF eat.AOR-PST-3SG have-TH-3SG  
 'For a cat who ate the cheese, Maria has it.'  
 Մարիան կատու մը որ պանիրը կերաւ ունի:

We also find traces of this phonologically-conditioned extraposition with instrumental-  
 marked noun phrases (140). Such phrases act as modifiers. Data is limited, but it  
 seems they show similar extraposition patterns. These modifiers extrapose to not  
 break up the prosodic phrasing between the verb and the pre-verbal word. We  
 illustrate with an unaccusative verb 'to exist' that must be phrased with its sub-  
 ject (140a). Lack of extraposition creates a strong connotation of topicalization  
 (140b).

- (140) a. (S V)<sub>φ</sub> (Adj N-INS)<sub>φ</sub>  
 'mart<sup>h</sup>-mə 'g-a-Ø ga'nantʃ atʃk-e'r-ov  
 person-INDF exist-TH-3SG green eye-PL-INS  
 'There's a man with green eyes.'  
 Մարդ մը կայ կանանչ աչքերով:
- b. (S)<sub>φ</sub> (Adj N-INS)<sub>φ</sub> (V)<sub>φ</sub>  
 'mart<sup>h</sup>-mə ga'nantʃ atʃk-e'r-ov 'g-a-Ø  
 person-INDF green eye-PL-INS exist-TH-3SG  
 'A man with green eyes, he exists.'  
 Մարդ մը կանանչ աչքերով կայ:

perhaps do N+postposition + RC ㄅㄛㄅㄛ ㄅㄛㄅㄛㄅㄛ ㄅㄛㄅㄛ ㄅㄛ ㄅㄛㄅㄛ ㄅㄛ

TODO: update with extraposition slide materials. mention verb focus contradiction

### 6.6.3 Imperatives

Imperative sentences have relatively simple morphosyntax. A declarative SOV sentence (141a) is changed to an imperative sentence (141b) by using imperative morphology on the verb. The imperative verb attracts the nuclear stress of the sentence away from the object. HD still perceives some level of prominence on the object, suggesting that the verb forms its own separate prosodic phrase.

- (141) a. (O      V)<sub>φ</sub>  
           nə'maŋ gə-k'hə'r-e-Ø  
           letter    IND-write-TH-3SG  
           'He writes letters.'  
           նամակ կը գրէ:
- b. (O)<sub>φ</sub>    (V)<sub>φ</sub>                    !  
           nə'maŋ k'hə'r-e-Ø  
           letter    write-TH-2SG  
           'Write letters!.'  
           նամակ գրէ':

Acoustically, it seems that the imperative verb tends to have a higher pitch H\* in the sentence. The stressed syllable of the verb is likewise significantly longer when it is imperative verb.

draw

The imperative verb is typically sentence-final. When it is sentence-medial, it still attracts stress (142c) .

- (142) a. (O      V)<sub>φ</sub>  
           nə'maŋ-ə gə-k'hə'r-e-Ø  
           letter-DEF IND-write-TH-3SG  
           'He writes the letter.'  
           նամակը կը գրէ:
- b. (O)<sub>φ</sub>    (V)<sub>φ</sub>                    !  
           nə'maŋ-ə k'hə'r-e-Ø  
           letter-DEF write-TH-2SG  
           'Write the letter!.'  
           նամակը գրէ':

- c. (V)<sub>φ</sub>                      (O)<sub>φ</sub>                      !  
       kʰəˈr-e-Ø              nɑˈmɑg-ə  
       write-TH-2SG letter-DEF  
       ‘Write the letter!’  
       Գրէ՛ նամակը:

Acoustically, it seems that the sentence-medial imperative tends to trigger post-focal deaccenting.

draw

More wide-scale acoustic data is needed to check if there any differences between imperative intonation and verb focus.

#### 6.6.4 Vocatives

A vocative sentence is when the name of a person is called out in an utterance. Contrast (143a) where the name of a person ‘Mariam’ simply said, as if from a list, vs. (143b) where the name is called out in order to catch the attention of the person.

- (143) a. marˈjam  
           Mariam  
           ‘Mariam.’ (reading from list)  
           Մարիամ:  
       b. ˈmarjam !  
           Mariam  
           ‘Mariam!’ (calling out to a person named Mariam)  
           Մարիամ:

In Armenian, there isn’t any special vocative morphology. Instead, vocative names usually get initial stress (Vaux 1998: 133). Vocative stress can also go on initial schwas (144b) (Ղարազյուլյան 1974: 220).

- (144) a. mægərˈdɪtʃ  
           Megerdich  
           ‘Megerdich.’ (reading from list)  
           Մկրտիչ:  
       b. ˈmægərdɪtʃ !  
           Megerdich  
           ‘Megerdich!’ (calling out to a person named Megerdich)  
           Մկրտիչ:

Initial stress is the norm (Աճառյան 1971a: 336,338, Մարգարյան 1997: 76). But depending on the specific name, there are reports of final stress or word-medial stress, and initial stress. Johnson (1954: 17) likewise documents some syllable-size restrictions on the positioning of irregular stress in the vocatives of an Eastern Armenian speaker. We suspect that such variation is mostly due to extralinguistic factors and social conventions. For example, when someone wants to greet a person, and if that name is sentence-final 145), then name of the person is often elongated, thus creating final stress.

- (145) p<sup>h</sup>arev mar'jam  
 hello Mariam  
 'Hello, Mariam.'  
 Բարեւ Մարիամ:

This is in contrast to hypocoristics which almost always take initial stress (§5.3.3).

Data is too limited to fully understand why there is such reported variation. Data is likewise too limited to know what are the exact acoustic differences between vocative stress vs. other types of focus.

## Part II

# Morphophonology





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# Grammar of Western Armenian

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