Phonosyntax of Armenian: Suffix alternations and auxiliary movement in Iranian Armenian

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Abstract

In Iranian Armenian, certain verbal suffixes display allomorphy or morphophonological alternations that are conditioned by the location of another word. These alternations are a phonosyntactic process, i.e., a syntax-sensitive morphophonological process. The choice of surface form for the perfective converb suffix depends on the location of an auxiliary. If the auxiliary is to the right of the suffix (with possible interveners), then the suffix uses the default form [-eɻ]. If the auxiliary is to the left of the suffix, then the marked form [-e] is used. The alternation cannot be reduced to phonology, and the verb and auxiliary must be part of same clause. Accessing such information requires an articulated framework for the syntax-phonology interface, such as in traditional Direct Reference models (Kaisse 1985), and allow the use of long-distance information. The data resists an analysis where phonology cannot fully access syntactic structures (Nespor & Vogel 1986; Samuels 2011).

Keywords: phonosyntax, syntax-sensitive phonology, non-adjacency

1 Introduction

Cross-linguistically, it is common for a phonological process to apply across words in connected speech, e.g., sandhi rules. Some sandhi rules are insensitive to morphological information (prosodic rules: Nespor & Vogel 1986), while others are highly sensitive to the morphological identity of the words involved (such as French liaison: Kaisse 1985). But almost always, the words that are involved in sandhi are linearly adjacent. This paper discusses data from Iranian Armenian, whereby a rule of sandhi is morphologically conditioned but can apply across words over multiple interveners. Such patterns are rarely

attested cross-linguistically, and shed light on various issues in the syntax-phonology interface.

Armenian is an Indo-European language made up of two standard lects, Standard Western Armenian and Standard Eastern Armenian (SEA), and multiple other non-standard varieties. SEA is the official language of the Republic of Armenia. This paper focuses on the Armenian community of Tehran, Iran, and its diaspora. The community is diglossic, using SEA as a formal register and Iranian Armenian (IA) as an informal register.

The phenomenon that we discuss is part of a larger set of patterns found across some Armenian dialects. We zoom in on Iranian Armenian as a case study. Briefly, the perfective converb suffix has the default surface form *-eɻ*. This suffix is used as part of a periphrastic construction: this suffix is on the verb, while tense-agreement is on an auxiliary (highlighted). The auxiliary is however mobile. If the auxiliary has moved to the left of the verb, then the converb suffix changes its surface form to [-e].

(1) a. gəɻ-eɻ =e-m
write-PERF =AUX-1SG
'I have written'

b. t͡ʃʰ =e-m gəɻ-e
NEG=AUX-1SG write-PERF
I have not written'

For illustration, we call [-eɻ] the default form, and [-e] the marked form. We sometimes label this process as allomorphy for Iranian Armenian, but a more abstract analysis for Iranian Armenian would use floating segments. Dialectal data is used to evaluate both proposals.

The default form is pre-auxiliary, while the marked form is post-auxiliary. The ultimate conditioning factor is syntactic and long-distance: the suffix has to precede the auxiliary within the same clause or verb phrase. The suffix and auxiliary can be adjacent or non-adjacent. Phonological cliticization of the auxiliary is not the synchronic cause of the alternation.

To analyze the data, we develop a simple theoretical model based on work on the syntax-phonology interface, specifically from Direct Reference theories of syntax-phonology interactions (Kaisse 1985). This process counts as a phonosyntactic or syntax-sensitive phonological process because of the deep interaction between the morphology, phonology, and syntax. The novelty of the data and analysis is a) the high level of morpheme-specificity in this phonosyntactic process, and b) the role of long-distance information in triggering this process.

This paper is organized as follows. We briefly explain our data sources (§2). We go over some basics of Armenian syntax with regards to the auxiliary and inflection (§3). We discuss the basic data on marked form-default forms in §4.1, and then analyze it in §4.2. We go through alternative analyses and refute them (§5). We catalog similar alternations in Iranian Armenian (§6) and other Armenian dialects (§7).

Long-distance factors are examined and analyzed in §8. The interim summary places the data within a theoretical context (§9). We then discuss other theoretically-insightful nuances of the language (§10.2). Conclusions are in §11.[1]

2 Clarification on data sources

The bulk of this paper concerns Iranian Armenian, and we give additional data from other varieties. For those other varieties, we cite our sources from pre-existing dialectal grammars. For Iranian Armenian, the bulk of our data comes from years of fieldwork on the language and engaging with the community.

For Iranian Armenian, author XX started to work on this language in early 2000s; his main informant was KM. Author XY did an independent stage of fieldwork in the 2010s; his main informants were diverse young adults. And then author XZ synthesized their work and did his own stage of fieldwork in the 2020s; his main informant was NK. The accumulation of our fieldwork is found in a published grammar anonymous. For this paper, some of the presented data is from the book, but most of it is from personal elicitations since 2020; the elicitation sessions focused on the suffix alternation in question.

Iranian Armenian is rather stigmatized and un-documented by the larger Armenian community, thus published data on this variety is difficult to come by. Speakers of this dialect often code-switch to SEA when communicating with outsiders. SEA lacks the relevant phenomenon that we discuss, so extra care is needed to elicit this grammatical process from our consultants. The authors focused on creating intimate professional relationships with their consultants so that we can focus on the grammatical properties of the Iranian Armenian register. Thus, the bulk of the data for this paper come from mainly one speaker (NK). NK provided data on the basic alternation which is systematic across speakers from our past fieldwork. For assurance on the data's validity for more controversial factors (= long-distance conditioning), we replicated the data with KM and three other consultants (GE, AM, OM). We have taken note of places where we have found micro-variations.

3 Background on syntax and inflection

In Iranian Armenian, word order is mainly SOV but SVO is possible. Most verbal inflection is marked via periphrasis. For example, the present indicative is marked by using the form of the verb called the 'imperfective converb'. Tense and agreement are marked on the auxiliary 'be'.

[1]For illustration, we use a more simplified glossing and segmentation than Anonymous. We use PERF and IMPF instead of PERF.CVB, IMPF.CVB for the perfective and imperfective converbs.

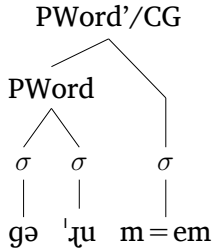
(2) a. jes giɻkʰ-ə **gəɻ-um** =e-m
I book-DEF write-IMPF AUX-1SG
'I am writing the book.' (NK)
Ես գիրքը գրում եմ։

b. du giɻkʰ-ə **kɒɻtʰ-um** =e-s
you book-DEF read-IMPF AUX-2SG
'You are reading the book.' (NK)
Դու գիրքը կարդում ես։

Throughout this paper we underline the relevant converb form. We highlight the auxiliary. We mark the nuclear stress of the sentence via boldface, as this information is quite relevant to the syntax of the auxiliary. In the above sentences (2), nuclear stress is on the verb.

In the examples in (2), the auxiliary is phonologically cliticized to the word to its left, i.e., the converb. Evidence for cliticization is the fact that the auxiliary is syllabified with the converb: [gə.ˈɻu.mem] 'I am writing'.[2] In terms of stress, words generally have final stress. The auxiliary is an unstressed clitic. A conventional analysis for Armenian clitics is that they are attached to the prosodic word of the host, and form either a recursive PWord (Dolatian 2021) or Clitic Group (Vaux 1998:42).

(3) Prosodic structure of clitics in 'I am writing'



In the simple sentences above, the auxiliary is by default after the verb. In more complex types of sentences, this auxiliary can move leftwards or be placed to the left of the verb (Comrie 1984; Kahnemuyipour & Megerdoomian 2011, 2017). Note that we use phrases like 'move leftward' in a descriptive non-theoretical manner.

Hosts for the mobile clitic include negation.

(4) jes giɻkʰ-ə **t͡ʃʰ =e-m** gəɻ-um
I book-DEF NEG=AUX-1SG write-IMPF

[2] A reviewer asked for evidence that the auxiliary is phonologically a clitic that is syllabified with converbs. Word-clitic resyllabification is perceivable to speakers, and non-speakers. Recordings can be found in our online fieldwork archive: anonymous

‘I am not writing the book.’ (NK)
Ես գիրքը չեմ գրում։

Negation is marked by using the prefix *t͡ʃʰ-*. When the verb is periphrastic, the negation prefix is placed directly before the verb, and the auxiliary moves leftwards and attaches to the prefix. The prefix-auxiliary combination acts as its own phonological word, and carries the nuclear stress of the sentence.

Another context for leftward placement involves bare objects. In the above sentences, the object of the verb is definite and resists taking nuclear stress. But if the object lacks any morphological markers for definiteness or indefiniteness, then the object is considered bare, takes nuclear stress, and takes the auxiliary.

(5) jes **giɻkʰ** =e-m gəɻ-um
I book =AUX-1SG write-IMPF
‘I am writing books.’ (NK)
Ես գիրք եմ գրում։

Another context is narrow focus. If a word has narrow focus and precedes the verb, then the auxiliary moves and attaches to that focused word.

(6) a. jes **giɻkʰ-ən** =e-m gəɻ-um
I book-DEF =AUX-1SG write-IMPF
‘I am writing **THE BOOK**.’ (NK)
Ես գիրքն եմ գրում։

b. **jes** =e-m giɻkʰ-ə gəɻ-um
I =AUX-1SG book-DEF write-IMPF
‘**I** am writing the book.’ (NK)
Ես եմ գիրքը գրում։

c. **esoɻ** =e-m giɻkʰ-ə gəɻ-um
today =AUX-1SG book-DEF write-IMPF
‘**TODAY**, I am writing the book.’ (NK)
Էսօր եմ գիրքը գրում։

It is obvious that there are strong correlations between auxiliary placement and nuclear stress. Such correlations have been modeled in the past with various frameworks and analyses (Tamrazian 1994; Megerdoomian 2009; Kahnemuyipour 2009; Kahnemuyipour & Megerdoomian 2011, 2017; Giorgi & Haroutyunian 2016; Hodgson 2019). We do not analyze or provide a larger catalog of contexts for auxiliary movement. For our purposes, we focus on the effects of auxiliary movement on the phonology of converbs.

4 Non-constant form of the perfective converb

Having overviewed the syntax of auxiliaries, this section shows how auxiliary movement or auxiliary placement interacts with the phonology of the perfective converb suffix. Briefly, the perfective suffix is *-eɻ* or *-el* when the auxiliary is on the right, but *-e* when the auxiliary is on the left within the same clause (§4.1). We analysis the data with either allomorphy or floating segments (§4.2).

4.1 Overview of the data

The imperfective converb suffix *-um* is phonologically constant. Its segments never delete or change, regardless of whether the suffix precedes the auxiliary or not. We summarize this constancy below.

Table 1: Constancy of form for the imperfective converb suffix *-um*

	jes	giɻkʰ-ə		**gəɻ-um**	=e-m
	I	book-DEF		write-IMPF	AUX-1SG
Base case:	'I am writing the book.'				
Neg:	jes	giɻkʰ-ə	**t͡ʃʰ =e-m**	gəɻ-um	
Bare object:	jes	**giɻkʰ** =e-m		gəɻ-um	
Narrow Focus:	**jes** =e-m	giɻkʰ-ə		gəɻ-um	

In contrast, the perfective converb is formed with the suffix *-el* or *-eɻ*. The liquid is absent when the auxiliary has moved.

When the perfective converb suffix precedes the auxiliary, some speakers produce this suffix as *-el*, some as *-eɻ*, and some as either. The choice of liquid varies by speaker and generation. XZ's primary consultant NK could use both forms, but she more often does *-eɻ*. Some speakers (KM, OS, GE, AM) prefer [-el].[3]

(7) jes giɻkʰ-ə **gəɻ-el/eɻ** =e-m
I book-DEF write-PERF =AUX-1SG
'I have written the book.' (NK)
Ես գիրքը գրել/գրեր եմ։

When the auxiliary is attached to the suffix, the auxiliary is syllabified with the suffix: [gə.ɻe.lem] or [gə.ɻe.ɻem].

[3]Some of these speakers report that the choice is generational or 'dialectal', but it's unclear what are the exact sociolinguistic correlates for using [-el] vs. [-eɻ]. We set that aside as tangential.

When the auxiliary shifts leftwards, the perfective converb suffix loses its liquid. We find deletion in configurations involving negation (8a), bare objects (8b), and narrow focus (8c-8d), among others.

(8) a. jes giɻkʰ-ə **t͡ʃʰ =e-m** gəɻ-e
I book-DEF NEG=AUX-1SG write-PERF
'I have not written the book.' (NK)
Ես գիրքը չեմ գրէ։

b. jes **giɻkʰ** =e-m gəɻ-e
I book =AUX-1SG write-PERF
'I have written books.' (NK)
Ես գիրք եմ գրէ։

c. **jes** =e-m giɻkʰ-ə gəɻ-e
I AUX-1SG book-DEF write-PERF
'**I** have written the book.' (NK)
Ես եմ գիրքը գրէ։

d. **esoɻ** =e-m giɻkʰ-ə gəɻ-e
today AUX-1SG book-DEF write-PERF
'**TODAY**, I have written the book.' (NK)
Էսօր եմ գիրքը գրէ։

We call [-eɻ, -el] the default form, while [-e] is the marked form. Whenever the auxiliary has shifted leftwards, the final liquid of the perfective converb suffix is absent, thus using the marked form [-e]. The table below summarizes the data so far, so that the link with linearity and deletion is clearer.

Table 2: Inconstancy of form for the perfective converb suffix *-eɻ*

	jes	giɻkʰ-ə		**gəɻ-eɻ**	=e-m
	I	book-DEF		write-PERF	AUX-1SG
Base case:	'I am writing the book.'				
Neg:	jes	giɻkʰ-ə	**t͡ʃʰ =e-m**	gəɻ-e	
Bare object:	jes	**giɻkʰ** =e-m		gəɻ-e	
Narrow Focus:	**jes** =e-m	giɻkʰ-ə		gəɻ-e	

Note that the above data has the marked form appear in sentence-final position. As we show later in §5.1, the sentence position of the verb does not matter. What matters is the location of the verb with respect to the auxiliary.

Past reviewers have been suspicious that the suffix alternation is so systematic for Iranian Armenian. To further illustrate its systematicity, we examined the text sample from

grammar which is a 9-minute comedy sketch in the language among 6 comedians. In their dialogues, the suffix alternation is systematic. There were 20 instances where a speaker uses the perfective converb suffix in one of its three basic forms (default /-el/ or /-eɻ/, and marked /-e). The distribution between the default and marked forms was systematic. The default form (n = 12) was used when before the auxiliary, and the marked form (n = 8) was used when the auxiliary was to the left of the verb. The appendix includes all the examples (§B).[4]

4.2 Formalizing the suffix alternation (final liquid deletion)

Based on the above data, the following questions arise: 1) What liquids can delete? 2) What blocks the deletion? And 3) what is the relationship between the liquid and the blocker?

For the first question, final liquid deletion is restricted to the perfective suffix. Liquids do not delete in any other contexts. Final liquids in roots and other suffixes surface without deletion. To illustrate in 9, the auxiliary is added to liquid-final words. When the auxiliary moves for subject focus, only the perfective suffix loses its liquid (9c). Note how the alternating perfective suffix [-e(ɻ)] is homophonous with the non-alternating plural suffix [-eɻ] (9b).

(9) a. nəɻpŋkʰ **təχuɻ** =e-n, **nəɻpŋkʰ** =e-n təχuɻ
they sad =AUX-3PL, they =AUX-3PL sad
'They are sad. **THEY** are sad.' (NK)
Նրանք տխուր են։ Նրանք են տխուր։

b. nəɻpŋkʰ **kʰɒɻ-eɻ** =e-n, **nəɻpŋkʰ** =e-n kʰɒɻ-eɻ
they rock-PL =AUX-3PL, they =AUX-3PL rock-PL
'They are rocks. **THEY** are rocks.' (NK)
Նրանք քարեր են։ Նրանք են քարեր։

c. nəɻpŋkʰ **gəɻ-eɻ** =e-n, **nəɻpŋkʰ** =e-n gəɻ-e
they write-PERF =AUX-3PL, they =AUX-3PL write-PERF
'They have written. **THEY** have written.' (NK)
Նրանք գրեր են։ Նրանք են գրէ։

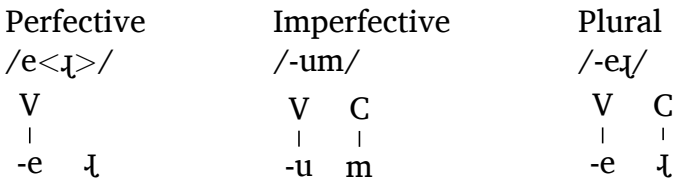
The converb suffix *-el/eɻ* is thus special in that it deletes, i.e., liquid deletion is specific to this morpheme. We can represent this specialness in terms of two possible theoretical

[4]There is no large-scale corpus of Iranian Armenian speech. The entire text sample is available as a Praat TextGrid on the grammar's associated data repository. There were no cases where there was an intervener between the suffix and the auxiliary such that the auxiliary was to the right the suffix (see §8 for long-distance contexts) The corpus included a case where the perfective converb suffix surfaced as an archaic form [-i] that we set aside (see grammar:112).

analyses: floating segments vs. allomorphy. Other analyses are of course possible but we consider these two as the most plausible.

The first analysis uses floating segments, also called ghost segments or latent segments (Zoll 1996, 2001; Akinlabi 2011; Zimmermann 2019; Lindsey 2019). Representationally, this suffix would then be underlyingly /-e<l>/ or /-e<ɻ>/ with a floating liquid. Underlyingly, the final consonant is not connected with its own consonant slot, cf. with a suffix like imperfective *-um* or plural *-eɻ* where the final consonant is connected to a timing slot.

Representation 1. Representing floating segments in the perfective converb suffix vs. non-floating imperfective



Such analyses have been used in the past to model segment-zero alternations that are morphophonologically conditioned, such as French liaison (Tranel 1995, 1996; Côté 2011) and the definite suffix in Armenian (Dolatian 2022). For example in French, the word *petit* 'small' is pronounced as [pəti] before consonants, but as [pətit] before vowels. The final segment *t* is considered a floating segment which variably surfaces. Such floating segments are often represented with parentheses or brackets: /pəti<t>/.

Alternatively, the second analysis simply treats the perfective converb suffix as having two possible allomorphs: /-e/ and /-eɻ/. The marked form [-e] is derived from a UR /-e/, and not from the other allomorph /-eɻ/.

The choice between the two representational solutions is difficult to make. Both seem descriptively equivalent. For illustration, we assume the floating segment analysis for Iranian Armenian, but nothing in this paper depends on this alternative.

For the second question, the default form (without liquid deletion) is selected essentially whenever the auxiliary is to the right of the suffix. The auxiliary is always vowel-initial, whether with an initial /e/, /i/, or /ɒ/.[5] A partial paradigm of auxiliary forms is in Table 3. Full paradigms can be found in Anonymous.

[5]In SEA, the cognate auxiliary has a full form [linel] 'to be'. But this consonant-initial form is not used in IA. The past perfective 2SG of the full form of this verb is [jeʁɑɾ] in SEA and [elɑɾ] in IA, but such form is not used in any periphrastic constructions with the perfective converb in IA.

Table 3: Variation in type of auxiliary vowel after the imperfective converb

[eɻ=e]:	jeɻkʰ-eɻ =e-m	sing-PERF =AUX-1SG	‘I have sung’	երգեր եմ
[eɻ=i]:	jeɻkʰ-eɻ =∅-i-m	sing-PERF =AUX-PST-1SG	‘I had sung’	երգեր իմ
[eɻ=ɒ]:	jeɻkʰ-eɻ =ɒ	sing-PERF =AUX.PRS.3SG	‘he has sung’	երգեր ա

The deletion or retention of the perfective liquid applies regardless of the person-number value of the auxiliary. Table 4 illustrates a partial paradigm for the present perfect. In the positive, the converb precedes the auxiliary, and the liquid surfaces. If an unstressed definite object is added, the converb’s liquid and the auxiliary stay the same. If the object is bare and takes stress, then the auxiliary shifts and causes the liquid to delete. For space, we gloss -PERF as -P, and -DEF as -D, and we do not segment the auxiliary.

Table 4: Liquid deletion across all person-number combinations of the perfective converb for the present perfect of [jeɻkʰ-e-l] ‘to sing’ (NK)

	sing-P =AUX	song-D sing-P =AUX	song =AUX sing-P
1SG	**jeɻkʰ-eɻ** =em	jeɻkʰ-ə **jeɻkʰ-eɻ** =em	**jeɻkʰ** =em jeɻkʰ-e
	‘I have sung.’	‘I have sung the song.’	‘I have sung songs.’
	Երգեր եմ։	Երգը երգեր եմ։	Երգ եմ երգէ։
2SG	**jeɻkʰ-eɻ** =es	jeɻkʰ-ə **jeɻkʰ-eɻ** =es	**jeɻkʰ** =es jeɻkʰ-e
	Երգեր ես։	Երգը երգեր ես։	Երգ ես երգէ։
3SG	**jeɻkʰ-eɻ** =ɒ	jeɻkʰ-ə **jeɻkʰ-eɻ** =ɒ	**jeɻkʰ** =ɒ jeɻkʰ-e
	Երգեր ա։	Երգը երգեր ա։	Երգ ա երգէ։
1PL	**jeɻkʰ-eɻ** =eŋkʰ	jeɻkʰ-ə **jeɻkʰ-eɻ** =eŋkʰ	**jeɻkʰ** =eŋkʰ jeɻkʰ-e
	Երգեր ենք։	Երգը երգեր ենք։	Երգ ենք երգէ։
2PL	**jeɻkʰ-eɻ** =ekʰ	jeɻkʰ-ə **jeɻkʰ-eɻ** =ekʰ	**jeɻkʰ** =ekʰ jeɻkʰ-e
	Երգեր էք։	Երգը երգեր էք։	Երգ էք երգէ։
3PL	**jeɻkʰ-eɻ** =en	jeɻkʰ-ə **jeɻkʰ-eɻ** =en	**jeɻkʰ** =en jeɻkʰ-e
	Երգեր են։	Երգը երգեր են։	Երգ են երգէ։

As we discuss later in §5, only the auxiliary can license the liquid of the perfective converb. There are limited counter-examples to this (§10.1). The converb suffix is morphologically unique because it can delete its liquid, and the auxiliary is morphologically unique because it blocks deletion. Liquid deletion and liquid retention are thus not the effect of simple phonological rule but of a highly morphologized morpheme-specific process that involves both morphology and phonology.

We can summarize this behavior again with either floating segments or allomorphy. For the floating segment analysis, we would need the following rule that anchors or causes floating consonants to surface when they precede the auxiliary.

Rule 1. Segment docking: Morpheme-specific rule of anchoring (surfacing) floating segments before the auxiliary (to be revised)

Simplified formulation			
<C>	→	C	/ _ AUX
More complex formulation			
C | X X	→	C C | | X X	/ _ AUX

We illustrate the application of this rule below.

Derivation 1. Derivation for anchoring the perfective liquid in simple sentences

Input	'I have written' gər-e<ɻ> =e-m write-PERF =AUX-1SG	'I have not written' t͡ʃʰ gər-e<ɻ> =e-m NEG write-PERF =AUX-1SG
Syntax Auxiliary movement		t͡ʃʰ =e-m gər-e<ɻ>
Morphophonology Anchoring the liquid	gər-eɻ =e-m	t͡ʃʰ =e-m gər-e

The above analysis uses a single UR with a floating segment: /-e<ɻ>/. If we alternatively used allomorphy, then Representation 1 and Rule 1 are replaced with Rule 2

Rule 2. Allomorphy: Two-allomorph analysis for the perfective converb (to be revised)

PERF	→	/-eɻ/	/ _ AUX	(default form)
		/-e/	/ elsewhere	(marked form)

The reader might notice that the rules above don't reference phonological cliticization or the phonological shape of the auxiliary. For example, the allomorphy rule for the default form uses the context '_ AUX' and not '_ V_{AUX}'. Although using cliticization is intuitively a reasonable factor, larger data shows that the phonological cliticization of the auxiliary is irrelevant. Other phonological clitics don't necessarily cause the suffix alternation (§5.3.2 though see §10.1), and the default form can be used even when there are interveners between it and the auxiliary (§8). The Lori dialect likewise shows a useful example of consonant-initial auxiliary triggering the default form (36 in §7.3). Cliticization is likely just a diachronic source for the synchronic grammaticalized alternation (§7.1).

By looking at the allomorphy formulation, notice that the marked form is the elsewhere case while the default form requires a special context. It is counter-intuitive that we

use the name ‘default form’ for the non-elsewhere case. The logic of our naming is that the ‘default form’ is used in basic unmarked sentences where the auxiliary is in its base position after the verb, while the ‘marked form’ is used in more complex and disparate types of sentences that necessitate moving the auxiliary.

There’s no obvious theoretical advantage of one analysis over the other. As the rules in Rule 1 are Rule 2 illustrate, both use a context ‘_ AUX’. Furthermore, the fact that the two surface forms [-e, -eɻ] are segmentally similar to each other would likely bias Iranian Armenian children to treat these two surface forms as derived from one UR.[6]

The above is our initial definition for these two equivalent rules. In the following sections, we refine the analysis in order to incorporate long-distance triggers. Such triggers involve a long-distance syntactic relationship between the verbs and the auxiliary. But we first verify the morpheme-specificity of the above generalization.

5 Disentangling syntactic and prosodic factors

The present analysis is restrictive. It licenses the default form (with the liquid) if and only if the suffix precedes the auxiliary within the same clause. One can hypothesize various alternative analyses for when to trigger liquid deletion or the marked form, each of which we refute as follows.[7]

- Deletion can apply in sentence-medial position, thus it is not triggered by sentence-final pauses (§5.1).
- Deletion can apply even if focus is on a subsequent word, thus it is not triggered by the simple presence of narrow focus (§5.2).
- Deletion can ignore subsequent vowels from other morphemes, whether full lexical words or clitics. Only the auxiliary can license the liquid (§5.3). Phonological cliticization is not the reason why the default form is used.

5.1 Deletion is insensitive to sentence position

Given the present data, one could hypothesize that the suffix alternation is a prosodic process triggered by a following sentence-final pause, not the movement of the auxiliary. This account turns out not to work.

[6] As a caveat, the citation form of the converb uses the liquid [gəɻ-eɻ] without any other word or auxiliary. However we don’t think this is a meaningful data point. Such utterances are essentially quotative and not used in natural conversation.

[7] Some reviewers hypothesized that perhaps the liquid is part of the auxiliary. This is also untenable, because the suffix [-eɻ] can follow a clitic [=el] ‘also’ (37a).

For example, in the following ditransitive constructions, the verb is between two noun phrases in a focus-neutral declarative sentence (10a). In the corresponding interrogative sentence, the auxiliary moves leftward and encliticizes to the wh-word. The verb can be sentence-final (10b) or sentence-medial (10c). In both cases, the verb lacks a final liquid. The marked form is used.

(10) a. es giɻkʰ-ə **təv-eɻ** =e-m d͡ʒon-i-n
this book-DEF give-PERF =AUX-1SG John-DAT-DEF
'I have given this book to John.' (NK)
Էս գիրքը տուեր եմ Ջոնին։

b. es giɻkʰ-ə **um-i-n** =e-s təv-e
this book-DEF who-DAT-DEF AUX-2SG give-PERF
'Who have you given this book to?' (NK)
Էս գիրքը ումի՞ն ես տուէ։

c. **um-i-n** =e-s təv-e es giɻkʰ-ə
who-DAT-DEF =AUX-2SG give-PERF this book-DEF
'Who have you given this book to?' (NK)
Ումի՞ն ես տուէ էս գիրքը։

The only factor that causes liquid deletion here is thus auxiliary placement. More examples of sentence-medial marked forms are found in (11).

(11) a. **d͡ʒon-i-n** =e-m təv-e giɻkʰ-ə
John-DAT-DEF =AUX-1SG give-PERF book-DEF
'I have given the book to **JOHN**.' (NK,KM,AM,OM)
Ջոնին եմ տուէ գիրքը։

b. d͡ʒon-i-n **t͡ʃʰ =e-m** təv-e giɻkʰ-ə
John-DAT-DEF NEG=AUX-1SG give-PERF book-DEF
'I have not given the book to John.' (NK,KM,AM,OM)
Ջոնին չեմ տուէ գիրքը։

c. giɻkʰ-ə **t͡ʃʰ =e-m** təv-e d͡ʒon-i-n
book-DEF NEG=AUX-1SG give-PERF John-DAT-DEF
'I have not given the book to John.' (NK,KM,AM,OM)
Գիրքը չեմ տուէ Ջոնին։

Note that because (Iranian) Armenian is understudied, the exact prosodic status of post-verbal words is unclear to us. Without detailed acoustic work on post-verbal prosody, we cannot know for sure if these post-verbal words are parsed in the same intonational phrase as the verb. However, previous work on Standard Armenian does suggest that post-verbal words can be part of the verb's intonational phrase (Hodgson 2020:141).

5.2 Deletion is sensitive to only linear effects of focus

In all previous cases, adding focus to the word caused both auxiliary movement and liquid deletion. One could thus hypothesize that it is focus itself which causes liquid deletion or the marked form, and not auxiliary placement. This is false. The evidence comes from post-verbal foci.

When a word is focused, the most typical situation is to place the focused word before the verb (12). In this case, the auxiliary encliticizes to the focused word. The direct object is optional and can be added at the end of the sentence. The verb then surfaces in its marked form without the final liquid, regardless of whether it is sentence-medial or sentence-final (12).

(12) a. jes **d͡ʒon-i-n** =e-m təv-e (es giɻkʰ-ə)
I John-DAT-DEF =AUX-1SG give-PERF this book-DEF
'I have given this book to JOHN.' (NK, KM, AM, OM)
Ես Ջոնին եմ տուէ (էս գիրքը)։

b. d͡ʒon-i-n **t͡ʃʰ =e-m** təv-e es giɻkʰ-ə
John-DAT-DEF NEG=AUX-1SG give-PERF this book-DEF
'I have not given this book to John.' (NK, KM, AM, OM)
Ջոնին չեմ տուէ էս գիրքը։

Note how there is vowel hiatus between the suffix and the subsequent word [es].

An alternative construction places the focused answer after the verb (13). In this case, the auxiliary does not shift leftwards but instead cliticizes to the verb. The verb then surfaces in its default form with a liquid.

(13) es giɻkʰ-ə təv-eɻ =e-m **d͡ʒon-i-n**
this book-DEF give-PERF =AUX-1SG John-DAT-DEF
'I have given this book to JOHN.' (NK)
Էս գիրքը տուեր եմ Ջոնին։

Thus, focus itself doesn't matter for the choice of forms. What matters is whether the auxiliary is placed leftward or not.

5.3 Deletion ignores vowels in other words

The core aspect of the default form (with liquid retention) is that only the auxiliary can license it. The auxiliary happens to be a vowel-initial clitic. No other vowel-initial clitic

or word can license the default form with the liquid. We go through cases where the suffix precedes a vowel-initial word or vowel-initial clitic, but we still see a marked form with liquid deletion.

5.3.1 Deletion ignores vowels in other lexical words

In the sentence below, a ditransitive verb is preceded by the auxiliary and then a vowel-initial direct object (14a). If the indirect object is focused (14b), the auxiliary moves leftward and the suffix liquid is absent. Similarly if the sentence is negated (14c), the auxiliary shifts and the liquid is absent. The vowel of the subsequent word cannot license the default form with the liquid.

(14) a. d͡ʒon-i-n **təv-eɻ** =e-m ɒtʰor-ə
[d͡ʒo.nin. tə.ve. ɻe. mɒ.tʰo.rə]
John-DAT-DEF give-PERF =AUX-1SG chair-DEF
'I have given the chair to John.' (NK)
Ջոնին տուեր եմ աթոռը։

b. **d͡ʒon-i-n** =e-m təv-e ɒtʰor-ə
[d͡ʒo.ni. nem. tə.ve. (ʲ)ɒ.tʰo.rə]
John-DAT-DEF =AUX-1SG give-PERF chair-DEF
'I have given the chair to **JOHN**.' (NK, KM, AM, OM)
Ջոնին եմ տուէ աթոռը։

c. d͡ʒon-i-n **t͡ʃʰ =e-m** təv-e ɒtʰor-ə
[d͡ʒo.nin. t͡ʃʰem. tə.ve. (ʲ)ɒ.tʰo.rə]
John-DAT-DEF NEG=AUX-1SG give-PERF chair-DEF
'I have not given the chair to John.' (NK, AM, OM)
Ջոնին չեմ տուէ աթոռը։

In the above sentences, we also provide a syllabified representation. In (14a), the vowel /ɒ/ of the direct object [ɒtʰor-ə] 'the chair' is syllabified with the preceding segment [m] the auxiliary /=e-m/: [e.mɒ]. Thus, this vowel can resyllabify with preceding segments. But in the focused form (14b), the vowel is not resyllabified with the suffix's liquid. The liquid is instead absent. A transient glide [j] is weakly noticeable between the suffix and the word 'chair': [e.ʲɒ]. Thus, although the vowel of 'chair' is phonologically able to syllabify with the auxiliary, it's not able to license the suffix's liquid.

The same pattern is found when the suffix precedes other vowel-initial words. Only an un-shifted auxiliary allows the liquid to surface. If the auxiliary has shifted, then the liquid is deleted.

(15) a. **d͡ʒon-i-n** =e-m təv-e eʃ-ə
John-DAT-DEF =AUX-1SG give-PERF donkey-DEF
'I have given the donkey to **JOHN**.' (NK, KM, AM, OM)
Ջոնին եմ տուէ էշը։

b. d͡ʒon-i-n **t͡ʃʰ =e-m** təv-e eʃ-ə
John-DAT-DEF NEG=AUX-1SG give-PERF donkey-DEF
'I have not given the donkey to John.' (NK, KM, AM, OM)
Ջոնին չեմ տուէ էշը։

c. **ɒtʰor-ən** =e-m təv-e ɒnɒj-i-n
chair-DEF =AUX-1SG give-PERF Ana-DAT-DEF
'I have given the **CHAIR** to Ana.' (NK, KM)
Աթոռն եմ տուէ Անայինն։

d. ɒtʰor-ə **t͡ʃʰ =e-m** təv-e ɒnɒj-i-n
chair-DEF NEG=AUX-1SG give-PERF Ana-DAT-DEF
'I have not given the chair to Ana.' (NK)
Աթոռը չեմ տուէ Անայինն։

e. **d͡zɒjn** =e-m ləs-e esoɻ
sound =AUX-1SG hear-PERF today
'I have heard a **SOUND** today.' (NK)
Ձայն եմ լսէ էսօր։

5.3.2 Deletion ignores vowels in other clitics

One could hypothesize that perhaps only clitics can license the default form with the liquid. The auxiliary is a clitic and it licenses the default form. But other clitics do not systematically do so. Thus, it is not the prosodic process of cliticization that licenses the default form, but the morphological identity of the auxiliary, which happens to be a phonological clitic.

Consider the clitic =*el* 'also'. This morpheme is a vowel-initial unstressed clitic that can syllabify with a preceding consonant (16a). After vowel-final words, it triggers glide epenthesis (16c).

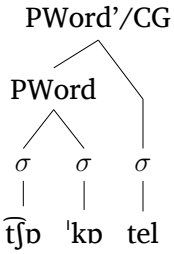
(16) a. t͡ʃɒˈ**kɒ**t=el 'forehead=also' 'also forehead' (NK)
[t͡ʃɒ.ˈ**kɒ**.tel]

b. uˈ**ɻɒ**χ=el 'happy=also' 'also happy' (NK)
[u.ˈ**ɻɒ**.χel]

c. kɒˈ**tu**=el 'act=also' 'also cat' (NK)
[kɒ.ˈ**tu**.jel]

Structurally, this morpheme is a clitic that leans onto its host's PWord. The prosodic structure of words with the clitic [el] is the same as words with the auxiliary (3).

(17) Prosodic structure of the clitics 'also'



When this clitic is combined with a negated verb, the clitic can be placed either after the auxiliary (18a) or after the verb (18b). In both cases, the verb uses the marked form without a liquid because the auxiliary shifted leftward. The clitic is vowel-initial and in the same prosodic word as the suffix; but the clitic cannot license the liquid of the default form. Vowel hiatus is repaired by epenthesizing a glide or glottal stop.

(18) Suffix alternation ignores clitics in negation

a. **t͡ʃʰ =e-m** =el keɻ-e
[t͡ʃʰe. mel. ke.ɻe]
NEG=AUX-1SG =also eat-PERF
'Also, I have not eaten.' (NK, KM)
Չեմ էլ կերէ։

b. **t͡ʃʰ =e-m** keɻ-e(*ɻ/*l) =el
[t͡ʃʰem. ke.ɻe. (j/ʔ)el]
NEG=AUX-1SG eat-PERF =also
'I have not eaten anymore.' (NK, KM)
Չեմ կերէ էլ։

In sum, the use of the default form with liquid retention is sensitive to only the auxiliary morpheme. This reinforces our rule in Rule 1 (only the auxiliary can license the liquid) or Rule 2 (only the auxiliary can license the default form). Phonological cliticization is not the synchronic reason for the alternation before the auxiliary. We have found limited micro-variation on this point; see §10.1.

6 Similar alternations in the irregular imperfective converb

All of the preceding data focused on the perfective converb suffix. This suffix shows an inconstant form, with or without a final liquid: [-el/ɻ] or [-e]. Whether a liquid surfaces or not depends on the syntactic relationship between the liquid and the auxiliary (§8.2). We find exactly the same behavior in another suffix: the irregular imperfective [-i(s)].

For regular verbs and most irregular verbs, the imperfective converb is formed by adding the suffix *-um* onto the verb root or stem. In contrast, there are two irregular verbs 'to give' and 'to come' which form their imperfective converb by adding the suffix *-is* to the infinitive.[8]

Table 5: Formation of regular and irregular imperfective converbs

	Regular 'to sing'		Irregular 'to give'	'to come'	
Infinitive	jeɻkʰ-e-l երգել	√-TH-INF	t-ɒ-l տալ	g-ɒ-l գալ	√-TH-INF
Impf. converb	jeɻkʰ-um երգում	√-IMPF	t-ɒ-l-is տալիս	g-ɒ-l-is գալիս	√-TH-INF-IMPF

In §3, we saw that the regular suffix *-um* has a constant form and never alternates. In contrast, the irregular suffix surfaces as *-is* when before the auxiliary, and as *-i* when the auxiliary has shifted leftwards.

(19) a. **t-ɒ-l-is** =e-m
give-TH-INF-IMPF =AUX-1SG
'I am giving.' (NK, KM, AM, OM)
Տալիս եմ։

b. **t͡ʃʰ =e-m** t-ɒ-l-i
NEG=AUX-1SG give-TH-INF-IMPF
'I am not giving.' (NK, KM, AM, OM)
Չեմ տալի։

Whenever movement happens for negation, stress, or foci, we see the marked form [-i].

(20) a. jes giɻkʰ-ə **t-ɒ-l-is** =e-m
I book-DEF give-TH-INF-IMPF =AUX-1SG

[8]Standard Eastern Armenian utilizes the same irregular imperfective forms for the verbs 'to come' [g-ɑ-l], 'to give' [t-ɑ-l], and 'to cry' [l-ɑ-l]. But in Iranian Armenian, the verb [l-ɑ-l] 'to cry' is replaced by regular [lɒt͡sʰ-e-l] 'to cry' which forms the imperfective converb with *-um*: [lɒt͡sʰ-um].

‘I am giving the book.’ (NK)
Ես գիրքը տալիս եմ։

b. jes giɻk^{h}-ə **t͡ʃ^{h} =e-m** t-ɒ-l-i
I book-DEF NEG=AUX-1SG give-TH-INF-IMPF
‘I am not giving the book.’ (NK)
Ես գիրքը չեմ տալի։

c. jes **giɻk^{h}** =e-m t-ɒ-l-i
I book =AUX-1SG give-TH-INF-IMPF
‘I am giving books.’ (NK)
Ես գիրք եմ տալի։

d. **jes** =e-m giɻk^{h}-ə t-ɒ-l-i
I AUX-1SG book-DEF give-TH-INF-IMPF
‘**I** am giving the book.’ (NK)
Ես եմ գիրքը տալի։

The imperfective [-is]∼[-i] alternation happens in the same contexts for the perfective [-el/ɻ]∼[-e] alternation. We adopt the same possible analyses for this suffix. All of our previous generalizations from §5 likewise apply to this suffix. For example data, see the appendix.

The first option is to treat the suffix as consisting of a floating segment: /-i<s>/. The segment /s/ is anchored before the auxiliary, due to the same rule from Rule 1 for the perfective converb suffix /-e<ɻ>/. The second option is to treat the suffix as having two allomorphs: default [-is] that’s licensed before the auxiliary, and marked form [-i] elsewhere (like Rule 2). There is no empirical evidence that distinguishes the two analyses for Iranian Armenian.

7 Alternations in other Armenian dialects

This paper focuses on Iranian Armenian. So far, we’ve seen two suffixes that display the default-marked alternation based on the location of the auxiliary. These suffixes are the perfective converb suffix [-eɻ] vs. [-e], and the irregular imperfective converb suffix [-is] vs. [-i]. This section looks at similar alternations in other dialects. Such alternations are not uncommon across different Armenian dialects (Դավթյան 1966:144; Vaux 2022:§3.2.1).

For these other dialects, we find cases that analytically pattern the same as Iranian Armenian (§7.1). That is, the default and marked forms are phonologically similar enough that they can be analyzed with floating segments /-e<ɻ>/, and not with allomorphy {/-eɾ, -e/}. But in some dialects (§7.2), the two forms are divergent enough that a floating

segment analysis is less plausible, while an allomorphy analysis is still tenable. And interestingly (§7.3), some of these dialects show the effects of optional auxiliary movement on the choice of suffix forms. This optionality reinforces the default status of the default forms, and the optionality is evidence for the importance of surface linear position of the auxiliary.

7.1 Alternations that involve phonologically similar morphs

Across Armenian dialects, the perfective converb suffix and the irregular imperfective converb suffix are susceptible to developing the default-marked form alternation.

First consider Standard Eastern Armenian, where the perfective converb suffix is *-el*, and the irregular imperfective converb suffix is *-is*. Whereas these suffixes alternate in Iranian Armenian, they do not in SEA. The forms of the suffixes remain constant /-el, -is/ regardless of whether the auxiliary has shifted leftwards.

(21) Constant forms in Standard Eastern Armenian

a. **gəɾ-el** =e-m, **t-ɑ-l-is** =e-m
write-PERF =AUX-1SG, give-TH-INF-IMPF =AUX-1SG
'I have written, I am giving.'
Գրել եմ, տալիս եմ։

b. **t͡ʃʰ =e-m** gəɾ-el, **t͡ʃʰ =e-m** t-ɑ-l-is
NEG=AUX-1SG write-PERF, NEG=AUX-1SG give-TH-INF-IMPF
'I have not written, I am not giving.'
Չեմ գրել, չեմ տալիս։

The Iranian Armenian suffix [-el/-eɻ] developed from the the same historical source as the Standard Eastern suffix. However in Colloquial Eastern Armenian (CEA) as spoken in Yerevan, it is reported that speakers can optionally drop the liquid /l/ and the fricative /s/ when the auxiliary has shifted (Ղարագյուլյան 1981:101; Dum-Tragut 2009:213,223; Ղամոյան et al. 2014:37).

(22) Optional deletion in Colloquial Eastern Armenian

a. **gəɾ-el** =e-m, **t-ɑ-l-is** =e-m
write-PERF =AUX-1SG, give-TH-INF-IMPF =AUX-1SG
'I have written, I am giving.'
Գրել եմ, տալիս եմ։

b. **t͡ʃʰ =e-m** gəɾ-e(l), **t͡ʃʰ =e-m** t-ɑ-l-i(s)
NEG=AUX-1SG write-PERF, NEG=AUX-1SG give-TH-INF-IMPF

‘I have not written, I am not giving.’
Չեմ գրել, չեմ տալիս։

Diachronically, the suffix alternation is categorical in Iranian Armenian and it likely developed from an optional variation as found in Colloquial Eastern Armenian. This optional alternation was likely encouraged by phonological cliticization and interacted with adjacency conditions (anonymous: §3.3.5).

Such optionality is grammaticalized in other Armenian varieties. For example in the old dialect of Yerevan, the perfective converb suffix is [-el], and the imperfective converb suffix is [-is]. These two suffixes reduce to [-e] and [-i] when the auxiliary has shifted.

(23) Old Yerevan Armenian (Աճառեան 1911:44; translated in Dolatian in review)

a. i. sir-el e-m
like-PERF AUX-1SG
‘I have liked.’
սիրել եմ

ii. **jes** e-m sir-e
I AUX-1SG like-PERF
‘**I** have liked (not someone else).’
յես եմ սիրե

b. i. l-a-l-is e-m
cry-TH-INF-IMPF AUX-1SG
‘I cry’
լալիս եմ

ii. **χí** e-s l-a-l-i
why AUX-2SG cry-TH-INF-IMPF
‘Why are you crying?’
խի՞ ես լալի

Our two representational analyses for Iranian Armenian can straightforwardly be translated for Yerevan Armenian. We either a) treat the suffixes as having a floating segment /-e<l>/ in a single UR (Representation 1) with a rule that anchors this floater before the auxiliary (Rule 1). Or b), utilize allomorphy with multiple URs {/-el, -e/} (Rule 2).

Just as for Iranian Armenian, the data for Yerevan cannot distinguish the two representational solutions. For completeness, the rest of this section catalogs all other such cases that we have been able to identify in the literature.

In the Karin dialect (also called Erzurum), the perfective converb alternates between default [-eɾ] and marked form [-e]. Tabriz has the same alternation (Աճառեան 1911:46; Dolatian in review).

(24) Karin Armenian (Մկրտչյան 1952:66,87; also Bezrukov 2022:120)

a. bʰeɾ-eɾ e-m
bring-PERF AUX-1SG
‘I have brought’
բʻէրէր եմ

b. **jes** e-m bʰeɾ-e
I AUX-1SG bring-PERF
‘**I** (focused) have brought’
յես եմ բʻէրէ

In Tbilisi Armenian, the perfective converb suffix alternates between default [-il] and marked form [-i]. Artial Armenian has the same alternation (Ա֊ճառյան 1953:166, 170).

(25) Tbilisi Armenian (Ա֊ճառեան 1911:56; translated in Dolatian in review)

a. sɪr-il i-m
like-PERF AUX-1SG
'I have liked'
սիրիլ իմ

b. t͡ʃʰ- i-m sɪr-i
NEG-AUX-1SG like-PERF
'I have not liked.'
չիմ սիրի

For Tbilisi, Gharibyan (Ղարիբյան 1941) reports that imperfective converb suffix is [-is]. He reports that suffix can optionally change to [-i] if the auxiliary has shifted. However, for the perfective converb suffix, Gharibyan does not report any optionality.

(26) Tbilisi Armenian (Ղարիբյան 1941:203-4)

a. t-ɑ-l-is i-m
give-TH-INF-IMPF AUX-1SG
'I give'
տալիս իմ

b. t͡ʃʰ- i-m t-ɑ-l-i(s)
NEG-AUX-1SG give-TH-INF-IMPF
'I do not give'
չիմ տալի, չիմ տալիս

c. gəɾ-il i-n
write-PERF AUX-3PL
'They have written'
գըրիլ ին

d. t͡ʃʰ- i-n gəɾ-i
NEG-AUX-3PL write-PERF
'They have not written'
չին գըրի

In Artvin Armenian, the regular imperfective converb suffix has the default form [-is], and the perfective converb suffix has the default form [-il]. When the auxiliary has shifted leftward, these two suffixes have the marked forms [-i] and [-i].

(27) Artvin Armenian (Ղարիբյան 1941:251-257)

a. gəɾ-e-l-is i-m
write-TH-INF-IMPF AUX-1SG
'I write'
գըրէլիս իմ

b. gəɾ-il i-m
write-PERF AUX-1SG
'I have written'
գըրիլ իմ

c. t͡ʃʰ- e-m gəɾ-e-l-i
NEG-AUX-1SG write-TH-INF-IMPF
'I do not write'
չէմ գըրէլի

d. t͡ʃʰ- e-m gəɾ-i
NEG-AUX-1SG write-PERF
'I have not written'
չէմ գըրի

To summarize, the suffix alternations in the perfective and imperfective converb suffixes aren't unique to Iranian Armenian. Other dialects have similar alternations, with similar ambiguities in the choice of representational analyses.

7.2 Alternations that involve phonologically dissimilar morphs

For Iranian Armenian, the default and marked forms are phonologically similar [-eɻ, -e], thus meriting using a single UR. But in some dialects, the default and marked forms are dissimilar, thus requiring an allomorphy analysis with multiple URs.

In Urmia, the perfective converb suffix has default form [iɾ] and marked [-i(ə)]. The imperfective converb suffix has the default form [-s] but the marked form is [-li].

(28) Urmia/Khoy Armenian (Ասատրյան 1962:99-100,117; Ղարիբյան 1941:275-7)

a. nəst-iɾ e-m
write-IMPF AUX-1SG
'I have sat.'
նըստիր էմ

b. t͡ʃʰ- e-m nəst-i(ə)
NEG-AUX-1SG write-PERF
'I have not sat.'
չէմ նըստի(ը)

c. kʲiɾ-e-s e-m
write-TH-IMPF AUX-1SG
'I write.'
կյիրէս էմ

d. t͡ʃʰ- e-m kʲiɾ-e-li
NEG-AUX-1SG write-TH-IMPF
'I do not write.'
չէմ կյիրէլի

The alternation between [-iɾ] vs. [-i(ə)], and between [-s] vs. [-li] cannot be obviously reduced to a floating segment analysis.[9] The most obvious analysis is just allomorphy with two URs, like Rule 2.

Rule 3. Allomorphy: Two-allomorph analysis for the perfective converb and imperfective converb in Urmia

PERF	→	/-iɾ/	/ _ AUX	(default form)
		/-i(ə)/	/ elsewhere	(marked form)
IMPF	→	/-s/	/ _ AUX	(default form)
		/-li/	/ elsewhere	(marked form)

Elsewhere in Iran, Salmast is also reported to have the imperfective alternation between default [-s] and marked [-li] (Vaux 2022). The rest of this section further catalogs dialects where the default and marked forms are substantially different enough to merit an allomorphy analysis.

Bayazit Armenian has an alternation for the past perfective converb suffix. The difference is that default form is [-i̯eɾ] while the marked form is [-e].

[9] Focusing on the imperfective suffix [-s, -li], even if we used a hypothetical UR like /-
<s>/, we would need to argue for a rule that docks the <s> before an auxiliary, while the <li> is docked only if <s> is undocked. It's unclear how to elegantly formulate such a rule in phonological or morphological terms. See Vaux (2022:57) for discussion on the diachronic source for these allomorphs.

(29) Bayazit subdialect of the old Yerevan dialect (Աճառեան 1911:45; translated in Dolatian in review)

a. ek-i̯er ɑ
come-PERF AUX.PRS.3SG
'He has come.'
Էկեր ա

b. t͡ʃʰ-i̯e-m ek-e
NEG-AUX-1SG come-PERF
'I have not come.'
չեմ էկէ

In Maragha, the perfective converb suffix has the default form [-iɾ]. When the auxiliary moves, the marked form of the suffix is [-V]. The quality of the vowel can vary based on vowel harmony.

(30) Maragha Armenian (Աճառյան 1926:298)

a. lss-iɾ i-m
hear-PERF AUX-1SG
'I have heard.'
լսսիր իմ

b. ʃɑt i-m ləss-ə
a.lot AUX-1SG hear-PERF
'I have heard a lot.'
շատ իմ լըսսը

In Sasun, the perfective converb suffix has the default form [-ij] and the marked form [-ə].

(31) Sasun (Պետոյան 1954:46,49)

a. kɾ-ij ə-m
write-PERF AUX-1SG
'I have written'
կրիյ ըմ

b. t͡ʃʰ-ə-m kɾ-ə
NEG-AUX-1SG write-PERF
'I have not written'
չըմ կրը

The Van dialect has a default form [-iɾ] and a marked form [-i̯e] (Աճառյան 1952:179,185).

The Shamakhi dialect has significant variation based on village (Բաղրամյան 1964:127, 134, 155). Some regions have no suffix alternation for the perfective converb suffix, such as an invariant [-æl] for Meysari. But the Shirvanzade region has the suffix alternate between default [-el] and marked [-i], and the Kerkenj region has the suffix alternate between default [-ɑl] and marked [-e].[10]

For dialects like Urmia (28) that use phonologically dissimilar morphs, using a single UR with a floating segment seems untenable. In contrast, an allomorphy approach is the most viable last resort.

[10]Another case is Karchevan Armenian where the imperfective converb is default [-j] and marked [-s] (Մուրադյան 1960:122), but the data seems inconsistent (ibid. 151) and there are other alternations involved (ibid. 126).

7.3 Optional movement of auxiliaries

The previous dialects showed that certain suffixes alternate between a default form and a marked form. The default form is used when the auxiliary is to the right of the suffix, while the marked form is used when the auxiliary has shifted. For the previous data, the marked form was necessary because there was no auxiliary to the right of the verb. But there are some dialects where the auxiliary can optionally move or repeat itself. This variation leads to variation in the choice of default vs. marked form.

In Alashkert, we find an interesting construction. The perfective converb has the default form [-i̯eɾ] that's licensed by a following auxiliary, and the marked form [-i̯e] when the auxiliary has moved, such as for focus or negation.

(32) Alashkert (Մադաթյան 1985:123)

a. kʰɑʁ-i̯eɾ i-s
reap-PERF AUX-2SG
'You have reaped.'
քաղեր իս

b. du **lav** i-s kʰɑʁ-i̯e
you good AUX-2SG write-PERF
'You have written well.'
դու լավ իս գրե

In negation, the auxiliary moves and thus we use the marked form [-i̯e]. But, this dialect can optionally include an extra auxiliary after the negated verb. In this case, the default form [-i̯eɾ] is used.

(33) Alashkert (Մադաթյան 1985:141-2)

a. t͡ʃʰ-ə-s kʰɑʁ-i̯e
NEG-AUX-2SG reap-PERF
'You have not reaped.'
չըս քաղե

b. t͡ʃʰ-ə-s kʰɑʁ-i̯eɾ i
NEG-AUX-2SG reap-PERF AUX
'You have not reaped.'
չըս քաղեր ի

For dialects like Alashkert, we see evidence that what we call the 'default' form truly is the default form. The perfective converb suffix is by default [-i̯eɾ] when there is an auxiliary to the right. If there is no such auxiliary, then we use the marked form. Thus, it is not the existence of auxiliary movement itself which triggers the marked form, but it is whether an auxiliary is present at all to the right of the verb.

A similar doubling construction is attested in Bayazet. In that dialect, the default form of the perfective converb is [-eɾ]. If the auxiliary has moved, then we use the marked form [-i̯e]. If the auxiliary is doubled, then the default form is used.

(34) Bayazet Armenian (Կատվալյան 2016:400,415,439)

a. gʰər-eɾ i̯e-m
write-PERF AUX-1SG
'I have written'
գ՛ըրէր եմ

b. t͡ʃʰ-i̯e-m gʰər-i̯e
t͡ʃʰ-i̯e-m gʰər-eɾ i̯e-m
NEG-AUX-1SG write-PERF AUX-1SG
'I have not written'
չեմ գ՛ըրե, չեմ գ՛ըրէր եմ

In Lori, we see interesting effects of optional movement. The perfective converb suffix is a non-alternating [-el]. In negation, the negated auxiliary is placed after the verb.

(35) Lori Armenian (Ասատրյան 1968:117)

a. nəst-el e-m
sit-PERF AUX-1SG
'I have sat'
նըստէլ էմ

b. nəst-el t͡ʃʰ-e-m
sit-PERF NEG-AUX-1SG
'I have not sat'
նըստէլ չէմ

But for the irregular converb suffix [-is], the negated auxiliary can optionally move before the verb. When it does move, we see the marked form [i].

(36) Lori (Ասատրյան 1968:117,134)

a. t-ɑ-l-is e-m
give-TH-INF-IMPF AUX-1SG
'I give'
տալիս էմ

b. t-ɑ-l-is t͡ʃʰ-e-m
t͡ʃʰ-e-m t-ɑ-l-i
NEG-AUX-1SG give-TH-INF-IMPF NEG-AUX-1SG
'I do not give'
չէմ տալի, տալիս չէմ

For Lori, we see that a consonant-initial negated auxiliary like [t͡ʃʰ-e-m] licenses the default form when post-verbal, and it licenses the marked form when pre-verbal. Thus, the choice of default vs. suffix form is not reducible to prosodic cliticization in Lori Armenian, just as we argued for Iranian Armenian.

To summarize, the above dialects have a default form and a marked form. The marked form is used when there is no auxiliary to the right of the verb. The default form is used

when there is such an auxiliary to the right of the verb. When there is an auxiliary both before and after the form, then the default form is used because the grammar is concerned only with what appears to the right of the verb.

This completes our discussion of other dialects. The rest of this paper returns the focus back to Iranian Armenian.

8 Long-distance conditions on the suffix alternation

For Iranian Armenian, the default form of the perfective converb is [-eɻ] while the marked form is [-e]. So far, we've seen cases where the marked form is used when the auxiliary shifts leftward. Based on these data, one could hypothesize that the default form surfaces (without the liquid) when the auxiliary is *immediately* to the right. We find evidence against this hypothesis. Data comes from intervening clitics and coordination (§8.1). Similar long-distance alternations are found in the imperfective converb suffix in Iranian Armenian. We analyze the data as a type of suspended affixation (§8.2) (Kabak 2007; Kornfilt 2012; Erschler 2018; Fenger 2020; Dolatian 2023). Alternative analyses with ellipsis are under-motivated (§8.3).

8.1 Cliticization and coordination in the perfective converb

Cliticization lets us see long-distance syntactic factors in the suffix alternation. The default form (with the liquid) surfaces if there is an auxiliary to the right within the verb phrase. Other clitics are ignored. For example, the clitic [=el] can appear between the verb and auxiliary (37a), or after the auxiliary (37b). The clitic does not prevent the default form from surfacing with the liquid. This is because the auxiliary is to the right of the suffix.

(37) Suffix alternation ignores intervening clitics (without negation)

a. keɻ-eɻ =el =e-m
eat-PERF =also =AUX-1SG
'I have also eaten.' (NK)
Կերեր էլ եմ։

b. keɻ-eɻ =e-m =el
eat-PERF =AUX-1SG =also
'I have eaten already!'[11] (NK)
Կերեր եմ էլ։

[11] NK found the Aux-Clitic sequence rather odd but acceptable, while KM + AM + OM felt it too odd.

Unfortunately, there are few unambiguous clitics in the language. There are some consonant-initial morphemes that are arguably clitics (Anonymous: §7.1), but they don't intervene between converbs and the auxiliary.

Coordination provides clearer long-distance conditions that affect the suffix alternation. In simple cases of coordination, two verbs can be coordinated each with their own auxiliary. In a sentence such as (38a), the default forms of both verbs surface because each is before an auxiliary. Note that speakers KM + AM + OM prefer using [-el] instead of [-eɻ].

(38) Coordination and suffix alternation

	Verb1	Aux	Conj	Verb2	Aux	
a.	χəm-eɻ	=e-m	kɒm	**keɻ-eɻ**	=e-m	
	drink-PERF	=AUX-1SG	or	eat-PERF	=AUX-1SG	
	'I have drunk or have eaten.'					(NK, KM, OM, AM)
	Խմեր եմ կամ կերեր եմ։					
b.	χəm-eɻ		kɒm	**keɻ-eɻ**	=e-m	
	drink-PERF		or	eat-PERF	=AUX-1SG	
	'I have drunk or eaten.'					(NK, AM, OM)
	Խմեր կամ կերեր եմ։					

But this sentence can be paraphrased with a simpler type of coordination which we call reduced coordination (38b). In reduced coordination, only one auxiliary is used. The auxiliary follows the second verb, and it licenses the default form of both verbs. Note how this auxiliary licenses the default form of the first verb (Verb1) even though they are not adjacent.

Note that a reviewer wonders if these reduced coordinated verbs form a single prosodic word. We don't think they do. Lexical stress is still audible on the final syllable of each verb: [χəˈm-eɻ kɒm keˈɻ-eɻ ...]. Thus the two verbs are still phonologically separate PWords.

The generalization so far is that, in reduced coordination, the single auxiliary can license the default form of both verbs without being adjacent to both of them. We repeat the relevant sentence below (39a). If this auxiliary shifted leftwards, then the auxiliary is to the left of both verbs (39b). Both verbs then use their marked forms without the liquid. Movement is found in negation (39b) and narrow focus (39c-d).

(39) Reduced coordination and auxiliary movement with consonant-initial conjunction

a.	χəm-eɻ	kɒm	**keɻ-eɻ**	=e-m
	drink-PERF	or	eat-PERF	=AUX-1SG
	'I have drunk or eaten.'			(NK, AM, OM)
	Խմեր կամ կերեր եմ։			

b. **t͡ʃʰ =e-m** χəm-e kɒm keɻ-e
NEG=AUX-1SG drink-PERF or eat-PERF
'I have not drunk or eaten.' (NK, KM, AM, OM)
Չեմ խմէ կամ կերէ։

c. **jes =e-m** χəm-e kɒm keɻ-e
I=AUX-1SG drink-PERF or eat-PERF
'**I** have drunk or eaten.' (NK)
Ես եմ խմէ կամ կերէ։

d. **esoɻ =e-m** χəm-e kɒm keɻ-e
today =AUX-1SG drink-PERF or eat-PERF
'**TODAY**, I have drunk or eaten.' (NK, KM, AM, OM)
Էսօր եմ խմէ կամ կերէ։

In the positive form, some speakers prefer repeating the conjunction on both verbs (40a). The single auxiliary licenses the default form (with liquids) on both verbs. Also when negating reduced coordination, an alternative construction is to delete the conjunction entirely (40b). Again this doesn't matter and we see the marked forms without liquids.

(40) a. kɒm χəm-el kɒm keɻ-el =e-m
or drink-PERF or eat-PERF AUX-1SG
'I have drunk or driven.' (KM, AM, OM)
Կամ խմել կամ կերել եմ։

b. **t͡ʃʰ =e-m** keɻ-e χəm-e
NEG=AUX-1SG eat-PERF drink-PERF
'I have not eaten or drunk.' (KM)
Չեմ կերէ խմէ։

The same patterns are found with the conjunctions [u] and [jev] 'and'. First consider un-reduced coordination with two auxiliaries.

(41) Unreduced coordination with other conjunctions

a. χəm-eɻ =e-m u **kʰəʃ-eɻ** =e-m
drink-PERF =AUX-1SG and drive-PERF =AUX-1SG
'I have drunk and have driven.' (NK, KM, OM, AM)
Խմեր եմ ու քշեր եմ։

b. χəm-eɻ =e-m jev **kʰəʃ-eɻ** =e-m
drink-PERF =AUX-1SG and drive-PERF =AUX-1SG
'I have drunk and have driven.' (NK, KM, OM, AM)
Խմեր եմ եւ քշեր եմ։

In reduced coordination with one auxiliary, the marked form is used even though the suffix is followed by a vowel [u]. Note that the morpheme [u] is usually treated as a clitic (Vaux 1998:13). And like the clitic [el] 'also' (§5.3.2), this clitic does not license the default forms for speakers like NK.

(42) Reduced coordination and auxiliary movement with vowel-initial conjunction

a. χəm-eɻ u **kʰəʃ-eɻ** **=e-m**
drink-PERF and drive-PERF =AUX-1SG
'I have drunk and driven.' (NK, KM, AM, OM)
Խմեր ու քշեր եմ։

b. **t͡ʃʰ =e-m** χəm-e u kʰəʃ-e
NEG=AUX-1SG drink-PERF and drive-PERF
'I have not drunk and driven.' (NK, KM, AM, OM)
Չեմ խմէ ու քշէ։

c. **jes** =e-m χəm-e u kʰəʃ-e
I=AUX-1SG drink-PERF and drive-PERF
'**I** have drunk and driven.' (NK)
Ես եմ խմէ ու քշէ։

d. **esoɻ** =e-m χəm-e u kʰəʃ-e
today =AUX-1SG drink-PERF and drive-PERF
'**TODAY**, I have drunk and driven.' (NK, KM, AM, OM)
Էսօր եմ խմէ ու քշէ։

Note that the word 'and' can be expressed with one of two morphemes: the conjunction [u] or the conjunction [jev]. Informally, the conjunction [u] is used when the two conjuncts have a close semantic connection to each other. The conjunction [jev] is used regardless of such closeness. For example, to conjoin two verbs that each have an object, using the conjunction [jev] feels more natural than using the conjunction [u].

(43) d͡ʒuɻ-ə χəm-eɻ =e-m jev keɻpkuɻ-ə keɻ-eɻ =e-m
water-DEF drink-PERF =AUX-1SG and food-DEF eat-PERF =AUX-1SG
'I have drunk the water, and have eaten the food.' (NK)
Ջուրը խմեր եմ եւ կերակուրը կերեր եմ։

The conjunction [jev] can be used in reduced coordination, but is not preferred. In reduced coordination, we find the same behavior. The default forms are used with liquids liquids in the positive. If the auxiliary has shifted, then the liquids are deleted and we see the marked forms.

(44) Reduced coordination and auxiliary movement with consonant-initial conjunction [jev] 'and'

a. χəm-eɻ jev **kʰəʃ-eɻ** =e-m
drink-PERF and drive-PERF =AUX-1SG
'I have drunk and driven.' (NK, KM, AM, OM)
Խմեր եւ քշեր եմ։

b. **t͡ʃʰ =e-m** χəm-e jev kʰəʃ-e
NEG=AUX-1SG drink-PERF and drive-PERF
'I have not drunk and driven.' (NK, KM, AM, OM)
Չեմ խմէ եւ քշէ։

c. **jes** =e-m χəm-e jev kʰəʃ-e
I=AUX-1SG drink-PERF and drive-PERF
'**I** have drunk and driven.' (NK)
Ես եմ խմէ եւ քշէ։

d. **esoɻ** =e-m χəm-e jev kʰəʃ-e
today =AUX-1SG drink-PERF and drive-PERF
'**TODAY**, I have drunk and driven.' (NK, KM, AM, OM)
Էսօր եմ խմէ եւ քշէ։

In sum, we argue that coordination shows that the suffix alternation (= liquid anchoring) is conditioned by a non-adjacent but subsequent auxiliary. The generalization was observed in coordination sentences with two verbs. It can also be found in sentences with three verbs. Note that the sentences below were uttered by KM, who prefers using the [-el] form of the suffix instead of [-eɻ].

(45) Reduced coordination for three verbs

	Verb1	(Aux)	Verb2	(Aux)	Verb3	(Aux)	
a.	ek-el	=e-m	tes-el	=e-m	**hɒχtʰ-el**	=e-m	
	come-P	=AUX	see-P	=AUX	conquer-P	=AUX	
	'I have come, have seen, have conquered.'						(KM)
	Էկել եմ, տեսել եմ, յաղթել եմ։						
b.	ek-el		tes-el		**hɒχtʰ-el**	=e-m	
	come-P		see-P		conquer-P	=AUX	
	'I have come, seen, seen, conquered.'						(KM)
	Էկել, տեսել, յաղթել եմ։						

The previous data looked at long-distance factors of the suffix alternation of the perfective converb suffix [-eɻ, -e].[12] We see the same long-distance conditions for the irregular imperfective converb suffix [-is, -i]. The suffix surfaces as [-is] when the auxiliary is to

[12]A reviewer suggests that perhaps the long-distance licensing is due to maintaining identity in the shape of converb suffix between the different conjuncts. Such an analysis could work for the perfective converb, but not for the imperfective converb where we can coordinate an alternating [-i(s)] with a non-alternating [-um] (46).

the right within the phrase, even if not adjacent to the suffix. The suffix surfaces as [-i] when the auxiliary shifts leftwards.

(46) a. t-ɒ-l-is =e-m kɒm t͡sɒχ-um =e-m
give-TH-INF-IMPF =AUX-1SG or sell-IMPF =AUX-1SG
'I am giving or am selling.' (NK, KM, AM, OM)
Տալիս եմ կամ ծախում եմ։

b. t-ɒ-l-is kɒm t͡sɒχ-um =e-m
give-TH-INF-IMPF or sell-IMPF =AUX-1SG
'I am giving or selling.' (NK, KM, AM, OM)
Տալիս կամ ծախում եմ։

Our generalizations for the perfective converb *-eɻ* seamlessly extend to the imperfective *-is*. More examples are provided in the appendix. The data is further evidence for the role of long-distance syntactic conditions in morphophonological alternations.

8.2 Incorporating long-distance triggers

The cliticization and coordination data shows that the liquid surfaces if there's an auxiliary *somewhere* later in the sentence, not necessarily adjacent to the suffix. For our two representational analyses (floating segments or allomorphy), we revise the rules by letting the auxiliary simply follow the verb within some syntactic domain.

If the UR of the perfective converb is a single UR with a floating segment /-e<ɻ>/, then the following rule will dock the segment if there is an auxiliary to the (non-immediate) right.

Rule 4. Floating segment analysis: Morpheme-specific rule of anchoring (surfacing) floating segments before the auxiliary (final)

Simplified formulation
<C> → C / [_ . . . AUX]
More complex formulation
C C → C C / [_ . . . AUX] | | | | X X X X

We illustrate this rule below. For space, we use the gloss -P for -PERF, =AUX for =AUX-1SG.

Derivation 2. Derivation for anchoring the perfective liquid in coordination sentences

	'I have drunk or eaten'				'I have not drunk or eaten'				
Input	χəm-e<ɻ> eat-P	kɒm or	keɻ-e<ɻ> drink-P	=e-m is	t͡ʃʰ NEG	χəm-e<ɻ> eat-P	kɒm or	keɻ-e<ɻ> drink-P	=e-m is
Syntax					t͡ʃʰ =e-m	χəm-e<ɻ>	kɒm	keɻ-e<ɻ>	
Anchoring	χəm-eɻ	kɒm	keɻ-eɻ	=e-m	t͡ʃʰ =e-m	χəm-e	kɒm	keɻ-e	

If we alternatively use allomorphy with two URs {-eɻ, -e}, then the realization rules simply reference the non-immediate location of the auxiliary.

Rule 5. Allomorphy: Two-allomorph analysis for the perfective converb (final)

$$\begin{array}{lllll} \text{PERF} & \rightarrow & \text{/-eɻ/} & \text{/ [\_ ... AUX]} & \text{(default form)} \\ & & \text{/-e/} & \text{/ elsewhere} & \text{(marked form)} \end{array}$$

A reviewer notes that the long-distance condition in our rules (...) does a lot of 'heavy-lifting'. To give more computational context, although local conditioning is the norm in phonology and morphology (Odden 1986; Chandlee & Heinz 2018; Chandlee 2017), non-local or long-distance conditions are attested (Heinz & Lai 2013; Luo 2017; Božič 2019; Dolatian & Guekguezian 2022; Dolatian et al. 2022).

Note that we specifically said that the verb and auxiliary must be within the same syntactic domain. We are not sure what to label this domain. The domain must be verb-like, such as VP, vP, or AspP.[13] The verb and auxiliary have to be part of a domain together, and we cannot restate the rule in terms of simple non-linear precedence.

Evidence comes from un-reduced coordination with negation. In the sentence below, each verb takes its own auxiliary (47a). In (47b), the first auxiliary Aux1 shifts leftward for negation, while the second auxiliary Aux2 stays in place. Thus Verb1 uses the marked form without the liquid, while Verb2 uses the default form with the liquid. The default liquid of Verb1 (with a liquid) cannot be licensed by Aux2 even though Verb1 precedes Aux2. The reason is that Verb1 and Aux2 belong to separate verb phrases. For space, we simplify the glosses with -P for -PERF, =AUX for =AUX-1SG.

(47) Un-reduced coordination and negation

[13] Another option is to state that the auxiliary must c-command the verb in order to license the default form (Kaisse 1985).

	(Neg = Aux1)	Verb1	(Aux1)	Conj	Verb2	Aux2	
a.		χəm-eɻ	=e-m	kɒm	**keɻ-eɻ**	=e-m	
		drink-P	=AUX	or	eat-P	=AUX	
	‘I have drunk or have eaten.’						(NK)
	Խմեր եմ կամ կերեր եմ։						
b.	**t͡ʃʰ =e-m**	χəm-e		kɒm	keɻ-eɻ	=e-m	
	NEG = AUX	drink-P		or	eat-P	=AUX	
	‘I have not drunk, or I have eaten.’						(NK)
	Չեմ խմէ, կամ կերեր եմ։						

Given that the syntax of coordination is virtually un-described in any Armenian variety, it is an open question as to what exactly this domain is. However, regardless of whether we think this domain is the VP or higher, our morphophonological generalizations still stand.[14]

To summarize, the rules for the suffix alternation are quite complicated. The default form is [-eɻ] while the marked form is [-e]. The default form is used when there’s an auxiliary to the right of the suffix within the verb phrase. The suffix and auxiliary don’t need to be adjacent.

[14]If one of the conjuncts has an object, then reduced coordination sounds more degraded to our speakers and is harder to elicit (NK). One speaker (AM) finds that it’s grammatical to have unreduced coordination where the second conjunct has an object (1). If the object is bare, then it takes Aux2 (1a). Verb2 then loses its liquid. If we reduce this construction (1b), then Verb1 predictably loses its liquid. But if the object is definite, then Verb2 keeps Aux2 and the liquid (1c). If we reduce this construction, Verb1 variably loses its liquid (1d). Establishing and explaining this variation is an open challenge.

(1) a. esoɻ χəm-el =e-m u **mekʰenɒ** =e-m kʰəʃ-e
today drink-PERF AUX-1SG and car AUX-1SG drive-PERF
‘Today, I have drunk and I have driven a car.’ (AM)

b. esoɻ χəm-e(*l) u **mekʰenɒ** =e-m kʰəʃ-e
today drink-PERF and car AUX-1SG drive-PERF
‘Today, I have drunk and driven a car.’ (AM)

c. esoɻ χəm-el =e-m u mekʰenɒ-n **kʰəʃ-el** =e-m
today drink-PERF AUX-1SG and car-DEF drive-PERF AUX-1SG
‘Today, I have drunk and I have driven the car.’ (AM)

d. esoɻ χəm-e(l) u mekʰenɒ-n **kʰəʃ-el** =e-m
today drink-PERF and car-DEF drive-PERF AUX-1SG
‘Today, I have drunk and driven the car.’ (AM)

8.3 Alternative analysis with ellipsis

As an alternative to using long-distance rules, we could instead argue that reduced coordination sentences with one auxiliary actually have two auxiliaries underlyingly. The first auxiliary licenses the default form of Verb1. Ellipsis then deletes the first auxiliary.

(48) Ellipsis account for reduced coordination and suffix alternation with [kɒm]

a.	Verb1	Aux	Conj	Verb2	Aux	
	χəm-eɻ	=e-m	kɒm	**keɻ-eɻ**	=e-m	
	drink-PERF	=AUX-1SG	or	eat-PERF	=AUX-1SG	
	'I have drunk or have eaten.'					(NK)
b.	Verb1	~~Aux~~	Conj	Verb2	Aux	
	χəm-eɻ	~~=e-m~~	kɒm	**keɻ-eɻ**	=e-m	
	drink-PERF	=AUX-1SG	or	eat-PERF	=AUX-1SG	
	'I have drunk or eaten.'					(NK)

The problem with this analysis is the lack of positive evidence. If reduced coordination does utilize ellipsis, then that suggests that reduced coordination is syntactically derived from unreduced coordination, and that reduced coordination has the same underlying syntax as unreduced coordination. Ideally, we would have independent evidence for this syntactic derivation or identity, such as from the semantics or prosody. However, we do not.[15]

In terms of semantics, the sentence with two auxiliaries is not completely synonymous with the sentence with one auxiliary. Consider the conjunction is [u] 'and'. Two auxiliaries suggests one event where I drank, and another event where I drove (perhaps over a span of multiple days). Using one auxiliary suggests these are the same event and I engaged in drunk driving.

(49) Ellipsis account for reduced coordination and suffix alternation with [u]

a.	Verb1	Aux	Conj	Verb2	Aux	
	χəm-eɻ	=e-m	u	**kʰəʃ-eɻ**	=e-m	
	drink-PERF	=AUX-1SG	and	drive-PERF	=AUX-1SG	
	'I have drunk and I have driven.'					(NK)
b.	Verb1	~~Aux~~	Conj	Verb2	Aux	
	χəm-eɻ	~~=e-m~~	u	**keɻ-eɻ**	=e-m	
	drink-PERF	=AUX-1SG	and	drive-PERF	=AUX-1SG	
	'I have drunk and driven.'					(NK)

[15]Furthermore, if ellipsis is a relatively late process, then we would expect it to target lexical words more easily than a cliticized function word (the auxiliary) because only non-clitics can form prosodic words (Booij 1985; Chaves 2008).

This semantic distinction though is difficult to confirm with speakers. Author speaks Western Armenian dialect, and he finds such a distinction in his judgments for the Western Armenian perception of such sentences. For our Iranian speakers, NK reports that the distinction is possible if the reduced sentence is spoken fast enough to elicit a simultaneous reading, while AM felt it was too hard to parse regardless. More fine-grained semantic fieldwork is needed to tease apart the different readings.

As for the prosody, when there are two auxiliaries, there is a stronger pause before the conjunction [kɒm/u] than when only one auxiliary is used. Again, we find that this prosodic distinction is likewise visible in the English translation.

Cross-linguistically, there is semantic and prosodic evidence that reduced coordination is not always derived from un-reduced coordination via deletion (Takano 2004; Artstein 2005; Yoon 2017; Zuraw 2015), including Standard Western Armenian (Dolatian 2023). Our analysis of the Iranian Armenian data is consistent with this literature.

Some syntactic evidence against ellipsis is the fact that some reduced coordination constructions don't use an overt coordinator. In such constructions, we have a string of verbs and then a single auxiliary. Such constructions resemble a serial verb construction. Semantically, the construction implies that the verbal actions are done in either a very fast sequence or simultaneously.

(50) a. χəm-el kʰəʃ-el =e-m
drink-PERF drive-PERF AUX-1SG
'I have drunk and driven.' (AM, OM)
Խմել քշել եմ։

b. **t͡ʃʰ =e-m** χəm-e kʰəʃ-e
NEG=AUX-1SG eat-PERF drink-PERF
'I have not drunk and/or driven.' (AM, OM)
Չեմ խմէ քշէ։

c. **esoɻ** =e-m χəm-e kʰəʃ-e
today =AUX-1SG eat-PERF drink-PERF
'**TODAY** I have drunk and driven.' (AM, OM)
Էսօր եմ խմէ քշէ։

The above discussion doesn't disconfirm an ellipsis account. However, there is no obvious positive evidence for an elliptical nature for reduced coordination. Because Armenian is under-described, there is no virtually no information on the syntax of ellipsis in any Armenian variety. In fact, our brief discussion of prosody and semantics above is entirely impressionistic because there is no work on Armenian ellipsis. And conducting such work is beyond the scope of this paper. Thus, we think it's wiser to keep, as a null hypothesis, that what you see is what you get. It is a surface-true generalization that a) in reduced

coordination, the first verb uses a default form, and b) that the only visible auxiliary is far to the right of the coordination.

Furthermore, even if we did entertain an ellipsis account, that would not make the grammar of Iranian Armenian any less complicated. The cross-linguistic norm is for ellipsis to precede morphophonological rules and allomorphy (Banerjee 2020; Sailor 2022).[16] Thus if we accept the ellipsis account, then we have to allow our theory to either a) have morphophonological rules or allomorphy be triggered by invisible (yet adjacent) material, or b) have morphophonological rules and allomorphy precede the application of ellipsis. Such positions are controversial.

To summarize, the present analysis uses long-distance rules to handle the suffix alternation in reduced coordination. If we use ellipsis, the end result is that we replace one theoretically bizarre analysis (long-distance conditions) with another theoretically bizarre analysis (pre-ellipsis morphophonology). The ellipsis alternative also lacks any positive evidence from the semantics or prosody. We encourage future work to find better evidence for ellipsis.

9 Interim summary: theoretical rarity of the Armenian data

Cross-linguistically, the Iranian Armenian data is quite surprising and rare. The data constitutes a case of a syntax-sensitive morphophonological phenomenon that has the following properties:

1. It applies across words.
2. Depending on one's analysis, the phenomenon is sensitive to either a) the phonological form of the target of the suffix alternation (the perfective suffix has a floating segment), or b) to the morphological identity of the suffix (because of allomorphy).
3. It is sensitive to the morphological identity of the morpheme that triggers the alternation (the auxiliary).
4. It references the (potentially long-distance) syntactic relationship between the suffix and auxiliary.

In theoretical terms, the data can be categorized in terms of a post-lexical rule that is syntactically conditioned. Such cases are rarer than purely prosodic rules, but still attested (Selkirk 1986). Cross-linguistically, the norm is for post-lexical rules to be insensitive to syntax (Kiparsky 1982a,b, 1985; Cowper & Rice 1987; Kaisse & McMahon 2011; Bermúdez-Otero 2011). But there are other cases of syntax-sensitive post-lexical rules,

[16] There is however some recent work arguing that elided material can trigger allomorphy if the elided material (the auxiliary) is structurally higher than the allomorph (the suffix) (Erschler 2018; Banerjee 2021:16).

such as P1 rules (Kaisse 1985, 1990), post-syntactic chaining rules (Pak 2008), precompilation rules (Hayes 1990), and feature-chain-based interactions (Elordieta 1997).

Syntactic structural relationships (c-command) and hierarchy are likewise heavily involved in tone sandhi (Chen 1990; Duanmu 1997, 1999) and grammatical tone processes (McPherson & Heath 2016; Rolle 2018). The Armenian data references the syntactic relationship between the verbal suffix and the auxiliary. Such information requires a Direct Reference model for the syntax-phonology interface (Kaisse 1985). More restrictive models would limit how much syntactic information that the phonology can get (cf: modular theories in Scheer 2011). Some common restrictions are using only syntactically-derived prosodic constituents (Nespor & Vogel 1986), or referencing only stratal cycles and phases (Newell 2008; Newell & Piggott 2014; Bermúdez-Otero 2012). The Armenian data however resists such simpler accounts.

However, to our knowledge, most attested cases of syntax-sensitive phonology involve adjacency between the target and trigger/blocker. For example, such locality or adjacency constraints are common in Romance sandhi (Sampson 2016). French liaison is sensitive to pauses and hesitations, and is generally limited to cases where the liaison segment and the following vowel are adjacent (Kaisse 1985; Côté 2011).[17] Similarly in Italian, syntactic gemination, phonosyntactic doubling, and /u/-propagation are famous syntax-sensitive phonological processes, but they likewise involve locality or adjacency (Kaisse 1985; Nespor & Vogel 1986; Rizzi & Savoia 1993; Elordieta 2008; Passino 2013; Manzini & Savoia 2016; D'Alessandro & Scheer 2015; Ledgeway 2018). Local conditioning is likewise found across case studies of syntax-sensitive allomorphy in Germanic (Ackema & Neeleman 2003, 2004; Weisser 2019).

In contrast, the Iranian Armenian pattern is highly morphologized. It ignores prosodic structure (§5) and phonological locality (§8).[18]

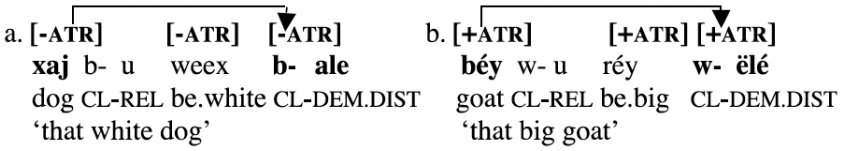
The Iranian Armenian data is thus cross-linguistically rare in allowing long-distance conditioning. To our knowledge, the closest attested case of long-distance syntax-sensitive morphophonology are a) long-distance and discontinuous vowel harmony in Wolof (Sy 2005) and Guébie (Dąbkowski & Sande 2021) and b) suppletion within serial verb constructions in Yoruba (Stahlke 1970:80ff, Carstens 2002:12, Nicholas Rolle, p.c.). We illustrate with Wolof.[19] For Wolof, vowel harmony applies across words, specifically between a head and its complement. This makes vowel harmony a type of syntax-sensitive phonology. Harmony can ignore certain intervening words between the source and target vowels. This invisibility of intervening words is what makes Wolof be a case of long-distance syntax-sensitive phonology.

[17] Some long-distance cases of French liaison are attested, with evidence for and against treating such cases as errors (Côté 2008).

[18] However, as documented in anonymous, the morphologized long-distance patterns of Iranian Armenian may have arisen from more phonologically local patterns in Colloquial Eastern Armenian.

[19] We thank Kie Zuraw for bringing the Wolof case to our attention. Another potential case is iterative or pervasive propagination in the Verbicaro dialect of Italian (Silvestri 2022:7).

(51) Long-distance ATR agreement in Wolof, taken from Sy (2005:95:ex1)



Interstingly, as stated in §7, there are other Armenian dialects that have a similar suffix alternation like Iranian Armenian. For those other dialects however, the relevant grammars do not provide enough data to verify or disconfirm the existence of interveners between the alternating suffix and the auxiliary. To our knowledge, only one recent work discusses non-adjacency and that is Bezrukov (2022) on Karin/Erzurum Armenian.

In that dialect, the perfective converb suffix has default forms [-el, -eɾ] and marked forms [-e]. Bezrukov reports that there is an intersective conjunction construction, which resembles what we call 'reduced coordination' but without an overt conjunction. In this construction, a single auxiliary is placed after two verbs. The single auxiliary licenses the default form of both verbs, without being adjacent to Verb1. In the negated form, the auxiliary shifts leftward, and the marked form is used for both verbs.[20]

(52) Karin or Erzurum Armenian (Bezrukov 2022:120)

a. təʁɑ =e-m pɑj-e metsts^{h}uts-e
baby AUX-1SG keep-PERF raise-PERF
'I kept the baby and raised it.'

b. as geʁ-e-n =e, p^{h}ɑχts^{h}uts-el beɾ-el =e dzeɾ
this village-ABL AUX.PRS.3SG, steal-PERF bring-PERF AUX.PRS.3SG your
geʁ
village
'She is from that village, he kidnapped and brought her to your village.'

Thus, Iranian Armenian has non-local conditioning for the suffix alternation. Such non-local conditioning is also attested in other similar dialects. The existence of such cross-dialectal data is evidence for the general robustness of non-adjacency factors in the suffix alternation.

10 Cliticization and sociolinguistics

This paper examined the synchronic behavior of the perfective converb suffix *-eɻ* and how this suffix loses its liquid when the auxiliary has shifted. This section describes

[20] We modified Bezrukov's IPA annotation and glossing. We suspect the word-initial voiced stops in his data might be aspirated.

other relevant and theoretically-interesting aspects of the suffix alternation. We focus on variation in other clitics and in codeswitching.

10.1 Residual factors from cliticization

The previous sections looked at how Iranian Armenian has default forms be selected by non-adjacent auxiliaries. This section looks at a cline whereby other clitics can license the default forms because of adjacency.

First, consider negation and the clitic /el/ 'also'. For Iranian Armenian, when a verb is negated, the auxiliary shifts and the marked form [-e] is used. For some speakers like NK and KM (our main consultants), adding a clitic [el] does not license the default form [-el, -eɻ]. But for another consultant GE, she can optionally keep the liquid in this context while still maintaining an IA register.

(53) Cliticization as last resort for default forms for some IA speakers

	Neg-Aux	Aux	CL	
i.	t͡ʃʰ =e-m	gəɻ-e		(KM, NK,GE)
	NEG-AUX-1SG	write-PERF		
	'I have not written.'			
	'Չեմ գրէ:'			
ii.	t͡ʃʰ =e-m	gəɻ-e	el	(KM, NK)
	t͡ʃʰ =e-m	gəɻ-e(l)	el	(GE)
	'I have not written anymore.'			
	NEG-AUX-1SG	write-PERF	also	
	'Չեմ գրէ/գրել եմ:'			

A speaker like GE seems to have a less strict generalization. For her, the default form is licensed either by the auxiliary or by an adjacent clitic. This generalization is clearer in reduced coordination.

First, consider reduced coordination with a consonant-initial conjunction like [kɒm] 'or'. In the positive case (V + Conj + V + Aux), both GE and NK use default forms. The auxiliary is not adjacent to the first verb, but it still licenses the default form. Thus, like NK, GE has the auxiliary non-locally license the auxiliary. Note that for GE, the default form is [-el], while for NK it is [-eɻ].[21] But in the negative (Aux + V + Conj + V), both NK and GE use the marked form [-e]. The auxiliary has shifted and cannot license the default form. The conjunction [kɒm] is consonant-initial and not cliticized to Verb1.

(54) With consonant-initial conjunctions, only non-adjacent auxiliaries license default forms for GE and NK in Iranian Armenian

[21] The full segmentation for [kɒɾtʰɒt͡sʰ-el] is [kɒɻtʰ-ɒ-t͡sʰ-el] with the gloss 'read-TH-AOR-PERF'.

i.	Verb1	Conj	Verb2	Aux	
	gəɻ-eɻ	kɒm	kɒʈʰɒt͡sʰ-eɻ	=e-m	(NK)
	gəɻ-el	kɒm	kɒʈʰɒt͡sʰ-el	=e-m	(GE)
	write-PERF	or	read-PERF	AUX-1SG	
	‘I have written or read.’				
	Գրել/գրեր կամ կարդացել/կարդացեր եմ։				
ii.	Neg-Aux	Verb1	Conj	Verb2	
	t͡ʃʰ=e-m	gəɻ-e	kɒm	kɒʈʰɒt͡sʰ-e	(NK, GE)
	*t͡ʃʰ=e-m	gəɻ-eɻ	kɒm	kɒʈʰɒt͡sʰ-eɻ	(*NK)
	*t͡ʃʰ=e-m	gəɻ-el	kɒm	kɒʈʰɒt͡sʰ-el	(*GE)
	NEG-AUX-1SG	write-PERF	or	read-PERF	
	‘I have not written or read.’				
	Չեմ գրէ կամ կարդացէ։				

But when the conjunction is vowel-initial like [u] ‘and’, then we see speaker variation between NK and GE. For NK and GE, the positive version uses the default form of the suffix because the auxiliary is on the right of the two verbs. In the negative form where the auxiliary has shifted, NK uses the marked form for both verbs. GE can use the marked form either (a) on both verbs or (b) just on the second verb.

(55) With vowel-initial conjunctions, adjacent clitics can license default forms for GE but not NK in Iranian Armenian

i.	Verb1	Conj	Verb2	Aux	
	gəɻ-eɻ	u	kɒʈʰɒt͡sʰ-eɻ	=e-m	(NK)
	gəɻ-el	u	kɒʈʰɒt͡sʰ-el	=e-m	(GE)
	write-PERF	and	read-PERF	AUX-1SG	
	‘I have written and read.’				
	Գրել/գրեր ու կարդացել/կարդացեր եմ։				
ii.	Neg-Aux	Verb1	Conj	Verb2	
	t͡ʃʰ=e-m	gəɻ-e	u	kɒʈʰɒt͡sʰ-e	(NK, GE)
	*t͡ʃʰ=e-m	gəɻ-eɻ	u	kɒʈʰɒt͡sʰ-e	(*NK)
	t͡ʃʰ=e-m	gəɻ-el	u	kɒʈʰɒt͡sʰ-e	(GE)
	NEG-AUX-1SG	write-PERF	and	read-PERF	
	‘I have not written and read.’				
	Չեմ գրէ/գրել ու կարդացէ։				

For GE, the generalization is that the default form is licensed either by a non-adjacent rightward auxiliary, or by an adjacent vowel-initial clitic. NK and all our other consultants are much stricter in that only the rightward auxiliary can license the default form, ignoring the presence of adjacent clitics.

Within a floating segment analysis, this difference between NK and GE is represented in the following rules.

Rule 6. Floating segment analysis: Morpheme-specific rule of anchoring (surfacing) floating segments before the auxiliary for NK and GE, but also before clitics for GE

$$\begin{array}{lcll} \text{<C>} & \rightarrow & \text{C} & / \text{ [\_ } \ldots \text{ AUX] } \quad \text{(obligatory for NK, GE, all others)} \\ \text{<C>} & \rightarrow & \text{C} & / \text{ \_ } = \text{V}_{\text{clitic}} \quad \text{(optional for GE)} \end{array}$$

We illustrate in Derivation 3. For illustration, we mark the floating segment as <l/ɻ>, because NK and GE differ in the choice of liquid quality.

Derivation 3. Derivation for anchoring the perfective liquid for NK vs. GE in the presence of clitics in IA

		'I have written or read'				'I have not written or read'			
Input		gəɻ-e<ɻ/l>	kɒm	kɒɻtʰɒt͡sʰ-e<ɻ/l>	=e-m	t͡ʃʰ =e-m	gəɻ-e<ɻ/l>	kɒm	kɒɻtʰɒt͡sʰ-e<ɻ/l>
Anchoring	NK:	gəɻ-eɻ	kɒm	kɒɻtʰɒt͡sʰ-eɻ	=e-m	t͡ʃʰ =e-m	gəɻ-e	kɒm	kɒɻtʰɒt͡sʰ-e
	GE:	gəɻ-el	kɒm	kɒɻtʰɒt͡sʰ-el	=e-m	t͡ʃʰ =e-m	gəɻ-e	kɒm	kɒɻtʰɒt͡sʰ-e
		'I have not written anymore'				'I have not written and read'			
Input		t͡ʃʰ =e-m	gəɻ-e<ɻ/l>	el		t͡ʃʰ =e-m	gəɻ-e<ɻ/l>	u	kɒɻtʰɒt͡sʰ-e<ɻ/l>
Anchoring	NK:	t͡ʃʰ =e-m	gəɻ-e	el		t͡ʃʰ =e-m	gəɻ-e	u	kɒɻtʰɒt͡sʰ-e
	GE:	t͡ʃʰ =e-m	gəɻ-e(l)	el		t͡ʃʰ =e-m	gəɻ-e(l)	u	kɒɻtʰɒt͡sʰ-e

Interestingly, the behavior of GE suggests a cline between NK's Iranian Armenian grammar and Colloquial Eastern Armenian. See Anonymous for data and discussion. The overarching generalization is that whereas IA allows non-local conditioning between the suffix and the auxiliary, some IA speakers also allow local conditioning.

10.2 Variation of deletion in code switching

In section §7.1, we saw that the perfective converb suffix has a constant form [-el] in Standard Eastern Armenian. In contrast in Iranian Armenian, the final liquid of this suffix [-el/-eɻ] deletes if the auxiliary has shifted leftwards. In this section, we document the effects of code switching between Standard Eastern and Iranian Armenian.

In the previous sections, two of our main consultants were NK and KM. NK was born and raised in California, and she considers her home languages to be Iranian Armenian and English. She did not go to an Armenian school, and did not acquire Standard Eastern Armenian. Thus, we consider her a mono-lectal Armenian speaker who knows only one register of Armenian: Iranian Armenian.

In contrast, Armenians raised in Tehran are typically bi-dialectal because they acquire Iranian Armenian at home, and Standard Eastern Armenian at school. Our consultant KM is bi-dialectal and can switch between registers. In her speech, we've noticed that when she code switches between registers, she variably deletes the perfective liquid. Deletion depends on formality.

(56) Effects of code switching for Iranian Armenian speakers who know Standard Eastern Armenian

a. Positive form: use a liquid

i. gəɻ-eɻ =e-m (Mono-lectal NK)

ii. gəɻ-el =e-m (Bi-lectal KM)

write-P =AUX

'I have written.'

Գրել/գրեր եմ։

b. Negative form: variably use a liquid

i. **t͡ʃʰ =e-m** gəɻ-e (Mono-lectal NK)

ii. **t͡ʃʰ =e-m** gəɻ-el (Bi-lectal KM – formal)

t͡ʃʰ =e-m gəɻ-e (Bi-lectal KM – informal)

NEG=AUX write-P

'I have not written.'

Չեմ գրէ/գրել։

Note how NK prefers the suffix form [-eɻ] while KM prefers [-el]. We capture this variation in terms of code switching between lexical items. When bi-dialectal speakers like KM code switch, they switch between using the perfective suffix [-el] with a consonant liquid /-el/ vs. a floating liquid /-e<l>/.

Complications arise in coordination contexts. To illustrate, consider the sentences below. In the positive form, both verbs have their liquid surface because the auxiliary is present. In the negated form, our mono-lectal speaker NK must delete both liquids on both verbs. In contrast, our bi-dialectal speaker KM can either delete both liquids or produce both liquids. Neither NK nor KM allow other permutations like liquid + no liquid, or no liquid + liquid.

(57) Effect of code switching in bi-dialectal speakers

a. Reduced coordination with one auxiliary: use a liquid

	Verb1	Conj	Verb2	Aux	
i.	χəm-eɻ	kɒm	keɻ-eɻ	=e-m	(Mono-lectal NK)
ii.	χəm-el	kɒm	keɻ-el	=e-m	(Bi-lectal KM)
	drink-P	or	eat-P	=AUX	

'I have drunk or eaten.'

Խմել/խմեր կամ կերել/կերեր եմ։

b. Reduced coordination with negation : use a liquid

	Neg-Aux	Verb1	Conj	Verb2	
i.	**t͡ʃʰ =e-m**	χəm-e	kɒm	keɻ-e	(Mono-lectal NK)
ii.	**t͡ʃʰ =e-m**	χəm-el	kɒm	keɻ-el	(Bi-lectal KM – formal)
	t͡ʃʰ =e-m	χəm-e	kɒm	keɻ-e	(Bi-lectal KM – informal)
	drink-P	or	eat-P	=AUX	
	'I have not drunk or eaten.'				
	Չեմ խմել/խմէ կամ կերել/կերէ։				

As with simple sentences, the coordination data suggest that code switching involves switching between lexical items: informal /-e<l>/ vs. formal /-el/. Interestingly, the same form must be used in both conjuncts. This suggests that bi-dialectal speakers can't code switch between conjuncts.

We acknowledge however that the above variationist data is quite limited in size. Unfortunately, there is no known corpus of Iranian Armenian speech that we could use to arrive at meaningful statistical rates for code-switching. But regardless, the above elicited data is suggestive evidence on a code-switching constaint for the suffix alternation.

11 Conclusion

Cross-linguistically, morphophonological rules that apply across words tend to obey phonological locality. Similarly, allomorphy tends to show locality restrictions. We have documented an exception from Iranian Armenian which violates such locality restrictions.

Two suffixes show an alternation between a consonant-final form vs. a vowel-final form: *-eɻ* vs. *-e*, and *-is* vs. *-i*. The use of two forms can be modeled with either ghost segments /-e<ɻ>/ or with allomorphy {-eɻ, -e}. But regardless of the exact representation analysis, the choice of form is conditioned by the location of the auxiliary within the sentence. If the auxiliary is to the left of the suffix, then the suffix uses the marked form. However knowing such linearity information requires access to the syntactic structure of the sentence. We argue that the data needs an articulated syntax-morphology-phonology interface such as in (Kaisse 1985; Elordieta 1997; Pak 2008).

In sum, Iranian Armenian presents a rare case of a floating segment or allomorph being licensed via syntactically-conditioned relationships. This relationship cannot be reduced to phonology or morphology. It is instead an interplay of all modules.

A Illustrative data for the irregular imperfective suffix

Section 5 examined the perfective converb suffix in depth. The goal was to eliminate alternative hypotheses about phonological or prosodic factors that affect the [-eɻ, -e] alternation. We likewise catalogued long-distance effects. We replicate this for the irregular imperfective suffix [-is, -i].

First, it doesn't matter if the suffix is sentence-medial and not sentence-final. If the auxiliary is placed leftward, then we use the marked form [i].

(58) a. **d͡ʒon-i-n** =e-m t-ɒ-l-i giɻkʰ-ə
John-DAT-DEF =AUX-1SG give-TH-INF-IMPF book-DEF
'I have given the book to **JOHN**.' (NK)
Ջոնին եմ տալի գիրքը։

b. **ɒɻpj-i-n** =e-m t-ɒ-l-i giɻkʰ-ə
Ara-DAT-DEF =AUX-1SG give-TH-INF-IMPF book-DEF
'I have given the book to **ARA**.' (KM, AM, OM)
Արային եմ տալի գիրքը։

c. **ɒɻp-n** =ɒ g-ɒ-l-i meɻ tun-ə
Ara-DEF =AUX.PRS.3SG come-TH-INF-IMPF our house-DEF
'**ARA** is coming to our house.' (KM)
Արան է գալի մեր տունը։

It doesn't matter if the suffix is followed by a vowel such as the demonstrative [es] or [et]. We still see the marked form [-i], with vowel hiatus.

(59) a. **ɒɻpj-i-n** =e-m t-ɒ-l-i es giɻkʰ-ə
Ara-DAT-DEF =AUX-1SG give-TH-INF-IMPF this book-DEF
'I am giving this book to **ARA**.' (KM)
Արային եմ տալի էս գիրքը։

b. **ɒɻpj-i-n** =e-m t-ɒ-l-i et giɻkʰ-ə
Ara-DAT-DEF =AUX-1SG give-TH-INF-IMPF that book-DEF
'I am giving that book to **ARA**.' (AM, OM)
Արային եմ տալի էտ գիրքը։

c. d͡ʒon-i-n **t͡ʃʰ =e-m** t-ɒ-l-i es giɻkʰ-ə
John-DAT-DEF =AUX-1SG give-TH-INF-IMPF that book-DEF
'I am not giving this book to John.' (NK)
Ջոնին չեմ տալի էս գիրքը։

d. ɒɻp-i-n **t͡ʃʰ =e-m** t-ɒ-l-i et giɻkʰ-ə
Ara-DAT-DEF NEG=AUX-1SG give-TH-INF-IMPF that book-DEF

‘I am not giving that book to Ara.’ (OM, ME)
Արային չեմ տալի էտ գիրքը։

It likewise doesn’t matter if the subsequent word is a vowel-initial lexical word.

(60) a. **d͡ʒon-i-n** =e-m t-ɒ-l-i ɒtʰor-ə
John-DAT-DEF =AUX-1SG give-TH-INF-IMPF chair-DEF
‘I am giving the chair to **JOHN**.’ (KM, AM, OM)
Ջոնին եմ տալի աթոռը։

b. d͡ʒon-i-n **t͡ʃʰ =e-m** t-ɒ-l-i ɒtʰor-ə
John-DAT-DEF NEG=AUX-1SG give-TH-INF-IMPF chair-DEF
‘I am not giving the book to chair.’ (NK, AM, OM)
Ջոնին չեմ տալի աթոռը։

c. **ɒtʰor-ən** =e-m t-ɒ-l-i ɒnɒj-i-n
chair-DAT-DEF =AUX-1SG give-TH-INF-IMPF Ana-DAT-DEF
‘I am giving the **CHAIR** to Ana.’ (NK, KM, AM, OM)
Ջոնին չեմ տալի աթոռը։

The clitic [el] does not trigger the default form for speakers NK, KM, OM, or AM. Note that our consultants preferred different English translations.

(61) a. **t͡ʃʰ =e-m** el t-ɒ-l-i
NEG=AUX-1SG also give-TH-INF-IMPF
‘I am also not giving.’ (NK, KM)
‘I am not giving anymore.’ (AM, OM)
Չեմ էլ տալի։

b. **t͡ʃʰ =e-m** t-ɒ-l-i el
NEG=AUX-1SG give-TH-INF-IMPF also
‘I am not giving anymore.’ (NK, KM)
‘I am not giving at all.’ (AM, OM)
Չեմ տալի էլ։

We see the long-distance effects in reduced coordination. First consider un-reduced coordination, where the suffix is immediately followed by an auxiliary, and thus uses the default form [-is].

(62) Unreduced coordination with other conjunctions

a. t-ɒ-l-is =e-m kɒm **t͡sɒχ-um** =e-m
give-TH-INF-IMPF =AUX-1SG or sell-IMPF =AUX-1SG
‘I give or I sell.’ (NK, KM, OM, AM)
Տալիս եմ կամ ծախում եմ։

b. t-ɒ-l-is =e-m u **t͡sɒχ-um** =e-m
give-TH-INF-IMPF =AUX-1SG and sell-IMPF =AUX-1SG
'I give and I sell.' (NK, KM, OM, AM)
Տալիս եմ ու ծախում եմ։

c. t-ɒ-l-is =e-m jev **t͡sɒχ-um** =e-m
give-TH-INF-IMPF =AUX-1SG and sell-IMPF =AUX-1SG
'I give and I sell.' (NK, KM, OM, AM)
Տալիս եմ եւ ծախում եմ։

In reduced coordination with the conjunction [kɒm], the first verb uses the default form [-is]. When the auxiliary has moved, we use the marked form [-i].

(63) Reduced coordination and auxiliary movement with consonant-initial conjunction

a. t-ɒ-l-is kɒm **t͡sɒχ-um** =e-m
give-TH-INF-IMPF or sell-IMPF =AUX-1SG
'I am giving or selling.' (NK, KM, AM, OM)
Տալիս կամ ծախում եմ։

b. **t͡ʃʰ =e-m** t-ɒ-l-i kɒm t͡sɒχ-um
NEG=AUX-1SG give-TH-INF-IMPF or sell-IMPF
'I do not give or sell.' (NK, KM, AM, OM)
Չեմ տալի կամ ծախում։

c. **esoɻ** =e-m t-ɒ-l-i kɒm t͡sɒχ-um
today =AUX-1SG give-TH-INF-IMPF or sell-IMPF
'**TODAY**, I give or sell.' (NK, KM, AM, OM)
Էսօր եմ տալի կամ ծախում

Alternative constructions with [kɒm] are attested.

(64) a. kɒm t-ɒ-l-is kɒm **t͡sɒχ-um** =e-m
or give-TH-INF-IMPF or sell-IMPF =AUX-1SG
'I give or sell.' (AM, OM)
Կամ տալիս եմ կամ ծախում եմ։

The same pattern is found with the conjunction [u].

(65) Reduced coordination and auxiliary movement with vowel-initial conjunction

a. t-ɒ-l-is u **t͡sɒχ-um** =e-m
give-TH-INF-IMPF and sell-IMPF =AUX-1SG
'I am giving and selling.' (NK, KM, AM, OM)
Տալիս ու ծախում եմ։

b. **t͡ʃʰ =e-m** t-ɒ-l-i u t͡sɒχ-um
NEG=AUX-1SG give-TH-INF-IMPF or sell-IMPF
'I do not give and sell.' (NK, KM, AM, OM)
Չեմ տալի ու ծախում։

c. **esoɻ =e-m** t-ɒ-l-i u t͡sɒχ-um
today =AUX-1SG give-TH-INF-IMPF or sell-IMPF
'**TODAY**, I give and sell.' (NK, KM, AM, OM)
Էսօր եմ տալի ու ծախում։

The same pattern is found with the conjunction [jev].

(66) Reduced coordination and auxiliary movement with vowel-initial conjunction

a. t-ɒ-l-is jev **t͡sɒχ-um =e-m**
give-TH-INF-IMPF and sell-IMPF =AUX-1SG
'I am giving and selling.' (NK, KM, AM, OM)
Տալիս եւ ծախում եմ։

b. **t͡ʃʰ =e-m** t-ɒ-l-i jev t͡sɒχ-um
NEG=AUX-1SG give-TH-INF-IMPF or sell-IMPF
'I do not give and sell.' (NK, KM, AM, OM)
Չեմ տալի եւ ծախում։

c. **esoɻ =e-m** t-ɒ-l-i jev t͡sɒχ-um
today =AUX-1SG give-TH-INF-IMPF or sell-IMPF
'**TODAY**, I give and sell.' (NK, KM)
Էսօր եմ տալի եւ ծախում։

In sum, the irregular imperfective suffix shows the same conditions from the perfective converb for its default-marked alternation [-is, -i].

B Corpus data on the suffix alternation

As explained in §4.1, we examined the distribution of the perfective converb suffix in anonymous. The distribution followed our analysis. The brackets were used to mark borrowings in the original annotation.

The perfective converb suffix surfaced as default form [-el] or [-eɻ] 12 times. In all these cases, the suffix was immediately before the auxiliary.

Three speakers would use the default form [-el] for a total of 5 times.

(67) Sentences of form /V-el AUX/ – 5

a. ɒnd͡ʒel ləs-el e-s es <væksin>-ə voɻ duɻs ɒ
Anjel hear-PERF AUX-2SG this vaccine-DEF that out AUX
g-ɒ-l-is
come-TH-INF-IMPF
'Anjel, have you heard of this vaccine that's coming out?' (Vahik; time 6ms)
Անջել, լսե՞լ ես էս <vaccine>-ը որ դուրս ա գալիս։

b. mɒm-i-n ɒs-el e-s kə-spɒn-e-m kʰez
mom-DAT-DEF say-PERF AUX-2SG FUT-kill-TH-1SG you.SG.DAT
'If you tell mom, I'll kill you.' (Garnik; time 203ms)
Մամին ասել ես, կը սպանեմ քեզ։

c. jes jes zɒŋg-el e-m kʰez-i luɻ t-ɒ-m
I I call-PERF AUX-1SG you.SG-DAT news give-TH-1SG
'I've, I've called to let you know' (Garnik; time 257ms)
Ես, ես զանգել եմ քեզի լուր տամ։

d. kɒɻt͡s-um e-m məɻs-el e-m
think-IMPF AUX-1SG sick-PERF AUX-1SG
'I think I've gotten sick.' (Garnik; time 280ms)
Կարծում եմ ես մրսել եմ։

e. hɒ gəɻ-el e-m
yeah.1INJ write-PERF AUX-1SG
'Yeah I've written it.' (Seda; time 317ms)
Հա գրել եմ։

Two speakers would use the default form [-eɻ] for a total of 7 times.

(68) Sentences of form /V-eɻ AUX/ – 7

a. es el gən-ɒ-t͡sʰ-eɻ ∅-i-ŋkʰ pæhlævi
this also go-TH-AOR-PERF AUX-PST-1PL Pahlavi
'And this is when we went to Pahlavi!' (Clodette; time 267ms)
Էս էլ գնացեր ինք <Pahlavi>։

b. pənd-ɒ-t͡sʰ-eɻ ɒ
harden-LV-AOR-PERF AUX
'It's hardened up.' (Clodette; time 357ms)
Պնդացեր ա։

c. met͡s-ɒ-t͡sʰ-eɻ ɒ
big-LV-AOR-PERF AUX
'It's gotten bigger' (Clodette; time 358ms)
Մեծացեր ա։

d. hɒɻjuɻ pŋkʰɒm ɒs-eɻ e-m sentsʰ <tʃʰo>-jeɻ mi
hundred time say-PERF AUX-1SG like.this rumor-PL PROH
kʰətsʰ-ekʰ bɒbɒ
spread-IMP.2PL dude
'I've said it hundreds of times - don't make these rumors up, man.' (Rubik; time 490ms)
Հարիւր անգամ ասեր եմ սենց <cho>-եր մի քցէք, բաբա:

e. hivɒnd-ɒ-tsʰ-eɻ e-n bɒbɒ me kʰitʃʰ <ehteɻpm>
sick-LV-AOR-PERF AUX-3PL dude INDF little respect
un-e-tsʰ-ekʰ
have-TH-AOR-IMP.2PL
'have gotten sick, man, respect them a bit' (Rubik; time 499ms)
հիւանդացեր են, բաբա մի քիչ <ehterām> ունեցէք:

f. zɒŋg-eɻ ɒ noɻ ɒs-um ɒ mets kənik ɒ tʃʰ-i el
call-PERF AUX new say-IMPF AUX big woman AUX NEG-AUX also
ɒmtʃʰ-e-n-um
embarrass-LV-INCH-IMPF
'She called me - she's a grown woman - she's not even embarrassed.' (Rubik; time 501ms)
Զանգեր ա նոր ասում ա, մեծ կնիկ ա, չի էլ ամչենում:

g. zɒŋg-eɻ ɒ ɒs-um ɒ
call-PERF AUX say-PERF AUX
'She called and said,' (Rubik; time 505ms)
Զանգեր ա ասում ա,

The marked form was used 8 times across 4 speakers. It was used when the auxiliary had shifted to the left.

(69) Sentences of form /AUX V-e/ – 8

a. bɒn ɒ sɒɻkʰ-e
thing AUX make-PERF
'They (Lit. it) have made a thing' (Vahik; time 126ms)
բան ա սարքէ

b. mæt <væksin> ɒ sɒɻkʰ-e voɻ me pŋkɒm piti
INDF.CLF vaccine AUX make-PERF that INDF time should
χəpʰ-e-s
strike-TH-2SG
'They (Lit: it) have made a vaccine where you only take it once.' (Vahik; time 127ms)
մի հատ vaccine ա սարքէ, որ մի անգամ պիտի խփես

c. himɒ t͡ʃʰ-e-m im-ɒ-n-um <koɻonɒ> e-m bərn-e
now NEG-AUX-1SG know-LV-INCH-IMPF corona AUX-1SG catch-PERF
'I don't know if I've gotten COVID,' (Garnik; time 282ms)
Հիմա չեմ իմանում կորոնա եմ բռնե,

d. tʰe uɻiʃ bɒn e-m bərn-e
or other thing AUX-1SG catch-PERF
'or if I've gotten something else.' (Garnik; time 283)
թե ուրիշ բան եմ բռնե:

e. noɻ luɻ e-m st-ɒ-t͡sʰ-e
new news AUX-1SG receive-LV-AOR-PERF
'I just got some news.' (Clodette; time 336ms)
Նոր լուր եմ ստացե:

f. səɻɒŋkʰ me noɻ <væksin> e-n sɒɻkʰ-e
these INDF new vaccine AUX-3PL make-PERF
'They've made a new vaccine.' (Clodette; time 340ms)
Սրանք մի նոր <vaccine> են սարքե:

g. u kɒɻt͡s-e-s <væksin> e-s st-ɒ-t͡sʰ-e
and think-TH-2SG vaccine AUX-2SG receive-LV-AOR-PERF
'It's just like you've received the vaccine' (Clodette; time 347ms)
Ու կարծես vaccine ես ստացե:

h. iɻɒŋkʰ kɻem e-n sɒɻkʰ-e
they cream AUX-3PL make-PERF
'They've made this cream.' (Seda; time 423ms)
Իրանք մի հատ կրեմ են սարքե:

There were no cases where the default or marked form of the perfective converb suffix was used in 'incorrectly'. That is, the default was used before the auxiliary, and the marked form was used after the auxiliary.

There were no cases where we could test long-distance conditioning of the suffix alternation.

There was only one instance of the irregular imperfective suffix /-i(s)/. In this one case, the speaker used the default form [-is] even though the auxiliary had shifted to the left. This is not predicted by our analysis. It's possible that the speaker was code-switching into a formal register when uttering this sentence because it was the first sentence of the entire dialogue.

(70) ɒnd͡ʒel ləs-el e-s es <væksin>-ə voɻ duɻs ɒ g-ɒ-l-is
Anjel hear-PERF AUX-2SG this vaccine-DEF that out AUX come-TH-INF-IMPF
'Anjel, have you heard of this vaccine that's coming out?' (Vahik; time 6)Անջել,
լսե՞լ ես <vaccine>-ը որ դուրս ա գալիս:

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