

Analytic Sketches: Syrian Arabic

1. Syrian Arabic

In this section, the core phonological processes of Syrian Arabic (Damascus dialect) are investigated, focusing on the alternations which arise in the inflectional paradigm of the verb. One of the central problems which pervades the phonology is the issue of the underlying representation of vowels. It will be seen that vowels have a somewhat abstract representation, so that underlying /i,u/ frequently become [e,o], [ə] or is deleted, and often does not actually surface as [i,u].

1.1. Preliminary on morphological structure

Verb roots in Arabic are traditionally analysed as being composed of consonants only. Vowels appear on the surface due to what is known as ‘templatic morphology’, where the typical underlying stem shape is of the form CVCVC in the perfective aspect, and CCVC in the imperfective. The particular vowel used in the perfective versus the imperfective is specified lexically, so some verbs use *a* in the perfective and *o* in the imperfective (*katab* perf. *-ktoḇ* impf. ‘write’), while others use *a* in the perfective and *e* in the imperfective (*ḥamal* perf. *-ḥmel* impf. ‘carry’), and others use *e* in the perfective and *a* in the imperfective (*ʔabel* perf. *ʔbal* impf ‘be able’). The imperfective stem can be used with subject suffixes to form the imperative, or with subject prefixes and suffixes to form the imperfective subjunctive. An additional prefix *b-* is used in indicative imperfective clauses. The subject marking prefixes and suffixes are as follows.

(1)	<i>perf.</i>	<i>imperf. subjunctive</i>	<i>imperative</i>	
3m	Ø	yə-		
3f	-et	tə-		
3p	-u	yə- -u		
2m	-t	tə-	Ø	
2f	-ti	tə- -i	-i	
2p	-tu	tə- -u	-u	
1s	-t	ə-		
1p	-na	nə-		

Many descriptive works present data in augmented versions of standard orthography or transliteration. Accordingly, y is [j], dot underneath t, d, s means pharyngealized t,d,s and š, ž are ʃ, ʒ

The underlying vowel patterns used are the following (where the first vowel is the vowel of the perfective and the second vowel is the vowel of the imperfective): *a/u*, *a/i*, *a/a*, *i/i*, *i/a*. Often, the high vowels are phonetically realized as [e], [o] or [ə], by rules to be discussed.

1.2. Basic CVCVC verbs

We begin our investigation by looking at the phonology of verb stems which select *a* in both the perfective and the imperfective. The data in (2) are examples of verb stems which select this vowel pattern.

(2)	‘ask’			‘shut’		
	perf.	impf. ind.	impf. subj	perf.	impf. ind.	impf. subj
3m	sáʔal	byəsʔal	yəsʔal	fátaḥ	byəftaḥ	yəftaḥ
3f	sáʔlet	btəsʔal	təsʔal	fáthet	btəftaḥ	təftaḥ
3p	sáʔalu	byəsʔalu	yəsʔalu	fátaḥu	byəftaḥu	yəftaḥu
2m	saʔálət	btəsʔal	təsʔal	fatáhət	btəftaḥ	təftaḥ
2f	saʔálti	btəsʔali	təsʔali	fatáhti	btəftahi	təftahi
2p	saʔáltu	btəsʔalu	təsʔalu	fatáhtu	btəftaḥu	təftaḥu
1s	saʔálət	bəsʔal	ʔəsʔal	fatáhət	bəftaḥ	ʔəftaḥ
1p	saʔálna	mnəsʔal	nəsʔal	fatáhna	mnəftaḥ	nəftaḥ
imp	sʔá:l, sʔáli, sʔálu			ftá:h, ftáhi, ftáhu		
	(masc sg, fem sg, pl)					

	‘send’			‘keep’		
	perf.	impf. ind.	impf. subj	perf.	impf. ind.	impf. subj
3m	báʕat	byəbʕat	yəbʕat	háfaz	byəhfaz	yəhfaz
3f	báʕtet	btəbʕat	təbʕat	háfzet	btəhfaz	təhfaz
3p	báʕatu	byəbʕatu	yəbʕatu	háfazu	byəhfazu	yəhfazu
2m	baʕátət	btəbʕat	təbʕat	hafázət	btəhfaz	təhfaz
2f	baʕátti	btəbʕati	təbʕati	hafázti	btəhfazi	təhfazi
2p	baʕáttu	btəbʕatu	təbʕatu	hafáztu	btəhfazu	təhfazu
1s	baʕátət	bəbʕat	ʔəbʕat	hafázət	bəhfaz	ʔəhfaz
1p	baʕátna	mnəbʕat	nəbʕat	hafázna	mnəhfaz	nəhfaz
imp	bʕá:t, bʕáti, bʕátu			hfá:z, hfázi, hfázu		

We start with the perfective forms, which are the simplest. Apart from assignment of stress, the only alternation found in that tense is the deletion of the second stem vowel *a* before the 3f subject suffix *-et*, where for example /saʔal-et/ → [saʔlet]. The context where this vowel is deleted – VC__CV – is the classical context for vowel syncope, however, it must be noted that the parallel form *saʔalu* does not undergo Syncope. At this point, we will propose a rule of Syncope, and await further data before explaining exactly where the rule applies.

- (3) *Syncope*
 $a \rightarrow \emptyset / VC _ Ce$

As far as stress assignment is concerned, stress in these examples is assigned either to the penultimate or antepenultimate syllable, depending on the suffix which follows. Stress generally falls on the penult in these examples, including when there is no affix, when the following affix is of the form -CV, and also before the suffix *-et*, but is on the antepenult before the 3p suffix *-u*. Further data will be required to make the principles of stress assignment clearer.

The imperfective inflection is fairly simple. There are a number of ways to state the generalization regarding stress for these forms. One generalization is that stress appears on the penultimate or antepenultimate syllables, depending on whether a vowel initial affix is added as was the case for perfective verbs; another generalization is that stress in the imperfective is word initial. Since stress is not generally word initial (cf. *saʔáltu*), we will not pursue the second observation further, but will await further data to make clear what the stress pattern is.

There is an alternation in the form of the indicative prefix *b-*, which surfaces as *m-* before the 1p imperfective prefix *nə*. This is transparently an assimilation of nasality, which can be accounted for by the following rule.

(4) *Nasalization*

$$b \rightarrow [+nasal] / _ [+nasal]$$

Another alternation occurs with a 1s subject. In the subjunctive, the prefix surfaces as ʔə (ʔəsʔal), but there is no glottal stop in the indicative following b - (bəsʔal). One analysis would be that the prefix is underlyingly $/ə/$ and glottal stop is inserted before an initial vowel. Or, the prefix could be $/ʔə/$ and glottal stop deletes after a consonant. This will not work, given examples such as imperfective bʔəsʔal and imperative sʔá:l where postconsonantal glottal stop survives. Therefore, we assume that the prefix is underlyingly $/ə/$ and posit the following rule.

(5) *Glottal Prothesis*

$$\emptyset \rightarrow ʔ / \# _ V$$

The last alternation which can be seen in this paradigm are found in the imperative. In the singular imperative, where no suffix is added, the stem vowel a is lengthened to $a:$. This is due to a restriction on the minimum allowed size of a word: $*sʔal$ is too short a word in Syrian Arabic, and therefore the vowel must be lengthened. The exact conditions on the minimal word will be discussed in detail as more data becomes available, but roughly, the smallest word must contain two vowels (including one long vowel), or else one vowel followed by two consonants. The following rule will account for this lengthening in the singular imperative.

(6) *Lengthening*

$$V \rightarrow VV / \#C_0 _ C\#$$

We next turn to verbs which select a as the stem vowel in the perfective and $/u/$ in the imperfective – although it will take more analysis to justify the claim that the vowel of the imperfective is actually u underlyingly, since on the surface the vowel surfaces as o in most contexts, and at this point we could just assume that the underlying vowel is $/o/$.

(7)	‘write’			‘command’		
	perf.	impf. ind.	impf. subj	perf.	impf. ind.	impf. subj
3m	kátab	byéktob	yéktob	ʔámar	byéʔmor	yéʔmor
3f	kátbet	btáktob	táktob	ʔámret	btéʔmor	téʔmor
3p	kátabu	byékətbu	yékətbu	ʔámaru	byéʔəmrū	yéʔəmrū
2m	katábət	btáktob	táktob	ʔamárət	btéʔmor	téʔmor
2f	katábti	btákətbī	tákətbī	ʔamárti	btéʔəmrī	téʔəmrī
2p	katábtu	btákətbu	tákətbu	ʔamártu	btéʔəmrū	téʔəmrū
1s	katábət	béktob	ʔéktob	ʔamárət	béʔmor	ʔéʔmor
1p	katábna	mnéktob	néktob	ʔamárna	mnéʔmor	néʔmor
imp	któ:b, ktébi, ktəbu			ʔmó:r, ʔméri, ʔmáru		

	‘study’			‘cook’		
	perf.	impf. ind.	impf. subj	perf.	impf. ind.	impf. subj
3m	dáras	byédros	yédros	ʔábax	byéʔbox	yéʔbox
3f	dárset	btédros	tédros	ʔábxet	btéʔbox	téʔbox
3p	dárasu	byédərsu	yédərsu	ʔábaxu	byéʔəbxu	yéʔəbxu
2m	darásət	btédros	tédros	ʔabáxət	btéʔbox	téʔbox
2f	darásti	btédərsi	tédərsi	ʔabáxti	btéʔəbxi	téʔəbxi

2p	darástu	btédərsu	tédərsu	ʔabáxtu	btéʔəbxu	téʔəbxu
1s	darásət	bédros	ʔədros	ʔabáxət	béʔbox	ʔéʔbox
1p	darásna	mnédros	nédros	ʔabáxna	mnéʔbox	néʔbox
imp	dró:s, drəsi, drəsu			ʔbó:x, ʔbəxi, ʔbəxu		

The perfective form of the verb stems in (7) work exactly like those in (2): the stem vowel is deleted before the suffix *-et*, and stress alternates between the penult and the antepenult.

Turning then to the imperfective forms of the verb, the stem has a different underlying phonological shape, namely CCoC (or CCuC). There is an alternation within these verbs between CCoC and CəCC, the latter appearing when a vowel initial affix follows the stem. One might posit a rather complex rule which changes the quality of the stem vowel and moves it between the first two stem consonants, but a better analysis would decompose this alternation into two simple operations. We will assume that the stem vowel is first deleted, so that underlying /byəktobu/ becomes *byəktbu*, and then exploit the fact that there are no clusters of three consecutive consonants in the language, which allows us to posit a rule of vowel epenthesis inserting schwa after the first of three consecutive consonants. Since we have not fully resolved the issue of Syncope in the perfective tense, we cannot yet determine whether the vowel deletion rule found in the imperfective data is the same rule as seen in the perfective forms. If indeed this vowel deletion were governed by the same rule, then the context could not be more specific than a following -V suffix, since the lefthand contexts where deletion takes place differ considerably, including just VC in the perfective but including VCC in the imperfective. We will therefore leave this issue unresolved temporarily, but eventually we will see that there must be two rules of vowel deletion. Epenthesis of schwa, on the other hand, poses no problems and can be accounted for by the following rule.

- (8) *Epenthesis*
 $\emptyset \rightarrow \text{ə} / C _ CC$

There is one further difference between these verbs and the verbs with /a/ in the imperfective. In the imperative, when a vowel initial suffix is added, there is no vowel lengthening, and instead the vowel *o* becomes schwa, thus /ktob-i/ \rightarrow *ktəbi*. Once more data is available, it will be seen that this is a reflection of the restricted distribution of the vowel *o* (also *e*) in the language, which appears only in the last syllable of a word. We will therefore tentatively assume the following rule.

- (9) *Mid vowel reduction*
 $e, o \rightarrow \text{ə} / _ C_0 V$

At this point, we turn to another class of verbs of the form CVCVC, this time verbs with the vowel *a* in the perfective and /i/ in the imperfective – on the surface, the perfective vowel is [e] alternating with schwa.

(10)	‘carry’			‘divide’		
	perf.	impf. ind.	impf. sbj	perf.	impf. ind.	impf. sbj
3m	hámál	byéħmel	yéħmel	ʔásam	byéʔsem	yéʔsem
3f	hámlet	btéħmel	téħmel	ʔásmet	btéʔsem	téʔsem
3p	hámalu	byéħəmlu	yéħəmlu	ʔásamu	byéʔəsmu	yéʔəsmu
2m	hámálət	btéħmel	téħmel	ʔasámət	btéʔsem	téʔsem
2f	hámálti	btéħəmli	téħəmli	ʔasám̄ti	btéʔəsmi	téʔəsmi
2p	hámáltu	btéħəmlu	téħəmlu	ʔasám̄tu	btéʔəsmu	téʔəsmu

1s	ḥamálət	béḥmel	ʔéḥmel	ʔasámət	báʔsem	ʔáʔsem
1p	ḥamálna	mnáḥmel	náḥmel	ʔasámna	mnáʔsem	náʔsem
imp	ḥmé:l, ḥmáli, ḥmálu			ʔsé:m, ʔsámi, ʔsámu		

	‘wash’				‘grasp’		
	perf.	impf. ind.	impf. subj	perf.	impf. ind.	impf. subj	
3m	ḡasal	byáḡsel	yáḡsel	kámaš	byákmeš	yákmeš	
3f	ḡaslet	btáḡsel	táḡsel	kámšet	btákmeš	tákmeš	
3p	ḡasalu	byáḡslu	yáḡslu	kámašu	byákəməšu	yákəməšu	
2m	ḡasálət	btáḡsel	táḡsel	kamášət	btákmeš	tákmeš	
2f	ḡasálti	btáḡsli	táḡsli	kamášti	btákəməši	tákəməši	
2p	ḡasáltu	btáḡslu	táḡslu	kamáštu	btákəməšu	tákəməšu	
1s	ḡasálət	báḡsel	ʔáḡsel	kamášət	bákmeš	ʔákmeš	
1p	ḡasálna	mnáḡsel	náḡsel	kamášna	mnákmeš	nákmeš	
imp	ḡsé:l, ḡsáli, ḡsálu			kmé:š, kməši, kməšu			

This set of verbs is essentially identical to the previous set, and differs only in that the vowel in the imperfective is [e] and not [o]; otherwise, the data are the same.

We now come to a fourth group of verbs, which select underlying /i/ in both the perfective and imperfective – again, we could also assume at this point that the vowel is underlying /e/. The imperfective is identical to the immediately preceding set, so requires no additional comment. The vocalic pattern of the verb in the perfective, on the other hand, is more complex.

(11)	‘descend’			‘hold’		
	perf.	impf. ind.	impf. subj	perf.	impf. ind.	impf. subj
3m	názel	byánzel	yánzel	másek	byámsek	yámsek
3f	názlet	btánzel	tánzel	másket	btámsek	támsek
3p	názlu	byánəzlu	yánəzlu	másku	byáməsku	yáməsku
2m	nzálet	btánzel	tánzel	msákət	btámsek	támsek
2f	nzáltu	btánəzli	tánəzli	msáktu	btáməski	táməski
2p	nzálti	btánəzlu	tánəzlu	msákti	btáməsku	táməsku
1s	nzálet	bánzel	ʔánzel	msákət	bámsek	ʔámsek
1p	nzálna	mnánzel	nánzel	msákna	mnámsek	námsek
imp	nzé:l, nzáli, nzálu			msé:k, msáki, msáku		

	‘dress’				‘be able’		
	perf.	impf. ind.	impf. subj	perf.	impf. ind.	impf. subj	
3m	lábés	byálbes	yálbes	ʔáder	byáʔder	yáʔder	
3f	lábset	btálbes	tálbes	ʔádret	btáʔder	táʔder	
3p	lábšu	byáləbsu	yáləbsu	ʔádru	byáʔədru	yáʔədru	
2m	lbəsət	btálbes	tálbes	ʔdərət	btáʔder	táʔder	
2f	lbəstu	btáləbsi	táləbsi	ʔdər̥tu	btáʔədri	táʔədri	
2p	lbəsti	btáləbsu	táləbsu	ʔdər̥ti	btáʔədru	táʔədru	
1s	lbəsət	bálbes	ʔálbes	ʔdərət	báʔder	ʔáʔder	
1p	lbəsna	mnálbes	nálbes	ʔdər̥na	mnáʔder	náʔder	
imp	lbé:s, lbəsi, lbəsu			ʔdér, ʔdəri, ʔdər̥u			

Let us compare the perfective forms of /katab/ ‘write’ with /nizil/ ‘descend’ to see where the differences lie.

(12)	3m	názel	kátab
	3f	názlet	kátbet
	3p	názlu	kátabu
	2m	nzólət	katábət
	2f	nzóltu	katábtı
	2p	nzóltı	katábtu
	1s	nzólət	katábət
	1p	nzólna	katábna

In the case of stems with /a/ in the perfective, it is obvious that the stem has the underlying shape CaCaC, since there is only one context where the stem is different. For stems such as ‘descend’, it is not so obvious what the underlying stem is, since the stem varies on the surface between CəCeC, CəCC and CCəC. We will begin with the alternation in the final vowel between *e* and *ə*, since that is the most straightforward. It has been observed above that *e* (and *o*) only appears in the final syllable of a word, and that there is a rule reducing the mid vowels to schwa in a nonfinal syllable. Application of this rule accounts for the second stem syllable in examples such as *nzóltu* from *nəzéltu* where *e* appears as schwa.

Now we consider the issue of the V ~ Ø alternation. Both of the stem vowels are subject to deletion in some context, cf. *názəl* ~ *názlu*, and *názəl* ~ *nzóltu*. Let us assume that both vowels are underlyingly present, and are subject to deletion in some context. Therefore, prior to deletion of the vowel, the perfective forms of ‘descend’ would be as follows.

(13)	3m	názəl	3f	názəl-et
	3p	názəl-u	2m	nəzól-ət
	2f	nəzól-tu	2p	nəzól-tı
	1s	nəzól-ət	1p	nəzól-na

The generalization regarding retention of the vowel schwa is now clear: it is deleted if it is unstressed and in an open syllable, otherwise it is retained. At this point we have no clear evidence whether the vowel that is deleted has the quality *e* or *ə*, and we will formalize our rule generally so that it would not matter what the underlying vowel quality is.

(14) *Nonlow vowel deletion*

$$\begin{array}{c} \text{V} \\ \left[\begin{array}{l} \text{- stress} \\ \text{- low} \end{array} \right] \rightarrow \emptyset / _ \text{CV} \end{array}$$

These data help to clarify an aspect of the phonology of imperfective verbs noted above. It was observed, in discussing stems such as *katab* ~ *ktob*, that there is a V ~ Ø alternation in the perfective; at that point it was not clear whether that alternation was due to the same rule as the one which accounts for /katabet/ → *katbet*. We can now see that these must be due to separate rules. Clearly, the deletion of unstressed nonlow vowels in open syllables cannot be generalized to include low vowels, as shown by the many forms where unstressed /a/ does not delete in an open syllable, such as 3p perfective *sáʔalu*, imperfective *byásʔalu*, 2m perfective *saʔálət*. We may now conclude that the Ø alternant in the imperfective is in

fact due to this rule specifically targetting nonlow vowels, and not some generalized syncope rule affecting all vowels.

Now we have a rule which accounts for the $V \sim \emptyset$ alternation of stems like *nəzel*, and a rule which accounts for the $e \sim \text{ə}$ alternation. The two most obvious choices regarding the underlying form of the stem are *nəzel* and *nezel* (another possibility is /nizil/, but at this point there is little reason to assume that underlying form). The advantage to assuming /nəzel/ is that it is fairly non-abstract: the underlying vowel is actually attested in some surface form. On the other hand, assuming /nezel/ allows us to express another generalization regarding vowels: within a stem type, there is only a single underlying vowel. Further data may clarify whether either of these assumptions has an empirical advantage.

Since we understand the vocalic alternations in perfective stems with /e/, we can present examples of stems with *e* in the perfective and *a* in the imperfective, which is the last class of vocalic patterns.

(15)	‘accept’			‘understand’		
	perf.	impf. ind.	impf. sbj	perf.	impf. ind.	impf. sbj
3m	ʔəbel	byəʔbal	yəʔbal	fəhem	byəfham	yəfham
3f	ʔəblet	btəʔbal	təʔbal	fəhmet	btəfham	təfham
3p	ʔəblu	byəʔbalu	yəʔbalu	fəhmu	byəfhamu	yəfhamu
2m	ʔbələt	btəʔbal	təʔbal	fəmət	btəfham	təfham
2f	ʔbəlti	btəʔbali	təʔbali	fəmti	btəfhami	təfhami
2p	ʔbəltu	btəʔbalu	təʔbalu	fəmtu	btəfhamu	təfhamu
1s	ʔbələt	bəʔbal	ʔəʔbal	fəmət	bəfham	ʔəfham
1p	ʔbəlna	mnəʔbal	nəʔbal	fəmnə	mnəfham	nəfham
imp	ʔbə:l, ʔbəli, ʔbəlu			fə:m, fəmi, fəmu		

The phonology of these stems is totally predictable at this point: the perfective works like /nizil/ so both vowels are subject to deletion, and the imperfective works like /saʔal/, so the stem vowel is not deleted.

1.3. Glide Initial CVCVC stems

In the data considered in the previous section, the nature of the root consonants did not make any difference to the phonology of the verb. However, stems with glides act different from other kinds of stems. In this section we concentrate on stems whose initial consonant is a glide, primarily /w/, since those stems have a different phonological pattern.

We will begin with verbs with *a* in both tenses; examples are given in (16).

(16)	‘place’			‘entrust’		
	perf.	impf. ind.	impf. sbj	perf.	impf. ind.	impf. sbj
3m	wədaʃ	byú:daʃ	yú:daʃ	wədaʃ	byú:daʃ	yú:daʃ
3f	wədʃet	btú:daʃ	tú:daʃ	wədʃet	btú:daʃ	tú:daʃ
3p	wədaʃu	byú:daʃu	yú:daʃu	wədaʃu	byú:daʃu	yú:daʃu
2m	wədaʃət	btú:daʃ	tú:daʃ	wədaʃət	btú:daʃ	tú:daʃ
2f	wədaʃti	btú:daʃi	tú:daʃi	wədaʃti	btú:daʃi	tú:daʃi
2p	wədaʃtu	btú:daʃu	tú:daʃu	wədaʃtu	btú:daʃu	tú:daʃu
1s	wədaʃət	bú:daʃ	ʔú:daʃ	wədaʃət	bú:daʃ	ʔú:daʃ
1p	wədaʃna	mnú:daʃ	nú:daʃ	wədaʃna	mnú:daʃ	nú:daʃ
imp	wədaʃ, wədaʃi, wədaʃu			wədaʃ, wədaʃi, wədaʃu		

The perfective inflection poses no problem. However, the imperfective of a *w*-initial root differs radically from the phonology of a root beginning with another consonant. Parallel examples from the subjunctive are given in (17).

(17)		‘place’		‘ask’
	3m	y-ú:ðaʃ		yé-sʔal
	3f	t-ú:ðaʃ		té-sʔal
	3p	y-ú:ðaʃu		yé-sʔalu
	2m	t-ú:ðaʃ		té-sʔal
	2f	t-ú:ðaʃi		té-sʔali
	2p	t-ú:ðaʃu		té-sʔalu
	1s	ʔ-ú:ðaʃ		ʔé-sʔal
	1p	n-ú:ðaʃ		né-sʔal

Parallel to ‘ask’, we would have expected forms such as the following.

(18)	3m	*yəwðaʃ	3f	*təwðaʃ
	3p	*yəwðaʃu	2m	*təwðaʃ
	2f	*təwðaʃi	2p	*təwðaʃu
	1s	*ʔəwðaʃ	1p	*nəwðaʃ

The actual surface forms are accounted for by a glide-vocalization rule.

- (19) *Glide Vocalization*
ə w C → u: C

Given this simple rule, we can now consider other vowel patterns among verb roots beginning with a glide. A number of such verbs have *a* in the perfective and *e* (/i/) in the imperfective.

(20)	‘describe’			‘promise’		
	perf.	impf. ind.	impf. subj	perf.	impf. ind.	impf. subj
3m	wáʃaf	byú:ʃef	yú:ʃef	wáʃad	byú:ʃed	yú:ʃed
3f	wáʃfet	btú:ʃef	tú:ʃef	wáʃdet	btú:ʃed	tú:ʃed
3p	wáʃafu	byú:ʃfu	yú:ʃfu	wáʃadu	byú:ʃdu	yú:ʃdu
2m	waʃáfət	btú:ʃef	tú:ʃef	waʃádət	btú:ʃed	tú:ʃed
2f	waʃáfti	btú:ʃfi	tú:ʃfi	waʃádti	btú:ʃdi	tú:ʃdi
2p	waʃáftu	btú:ʃfu	tú:ʃfu	waʃádtu	btú:ʃdu	tú:ʃdu
1s	waʃáfət	bú:ʃef	ʔú:ʃef	waʃádət	bú:ʃed	ʔú:ʃed
1p	waʃáfna	mnú:ʃef	nú:ʃef	waʃádna	mnú:ʃed	nú:ʃed
imp	wʃé:f, wʃéfi, wʃéfu			wʃé:d, wʃédi, wʃédu		

Apart from the vocalization of root initial *w* with *a*, these verbs behave just like roots such as *hamal*. Similarly, stems with initial *w* may have the vocalic pattern *e* in the perfective ~ *a* in the imperfective, and such verbs behave exactly like their counterparts with a non-glide in initial position (e.g. deletion the vowel /i/ in an unstressed open syllable).

(21)	‘fall’			‘arrive’		
	perf.	impf. ind.	impf. sbj	perf.	impf. ind.	impf. sbj
3m	wáʔeʃ	byú:ʔaʃ	yú:ʔaʃ	wáʃel	byú:ʃal	yú:ʃal
3f	wáʔʕet	btú:ʔaʃ	tú:ʔaʃ	wáʃlet	btú:ʃal	tú:ʃal
3p	wáʔʕu	byú:ʔaʕu	yú:ʔaʕu	wáʃlu	byú:ʃalu	yú:ʃalu
2m	wáʔʕet	btú:ʔaʃ	tú:ʔaʃ	wáʃelət	btú:ʃal	tú:ʃal
2f	wáʔʕti	btú:ʔaʕi	tú:ʔaʕi	wáʃelti	btú:ʃali	tú:ʃali
2p	wáʔʕtu	btú:ʔaʕu	tú:ʔaʕu	wáʃeltu	btú:ʃalu	tú:ʃalu
1s	wáʔʕet	bú:ʔaʃ	ʔú:ʔaʃ	wáʃelət	bú:ʃal	ʔú:ʃal
1p	wáʔʕna	mnú:ʔaʃ	nú:ʔaʃ	wáʃelna	mnú:ʃal	nú:ʃal
imp	wáʔa:ʕ, wáʔaʕi, wáʔaʕu			wáʔa:l, wáʔali, wáʔalu		

One stem begins with the glide *y*, which selects this same vowel pattern. As the following paradigm shows, the glide *y* vocalizes to long *i*:

(22)	‘dry up’		
	perf.	impf. ind.	impf. sbj
3m	yábes	byí:bas	yí:bas
3f	yábsət	btí:bas	tí:bas
3p	yábsu	byí:basu	yí:basu
2m	ybəsət	btí:bas	tí:bas
2f	ybəsti	btí:basi	tí:basi
2p	ybəstu	btí:basu	tí:basu
1s	ybəəsət	bí:bas	ʔí:bas
1p	ybəəsna	mní:bas	ní:bas
imp	ybəa:s, ybəasi, ybəasu		

This can be explained by a simple generalization of Glide Vocalization to include all glides.

1.4. CV:C Stems

Not all stems are of the surface shape CVCVC, and in this section we consider the phonology of stems with the shape CV:C, whose phonology differs considerably from that of CVCVC stems. We begin with stems which select the vocalism *a* in both the perfective and imperfective in (23).

(23)	‘sleep’			‘appear’		
	perf.	impf. ind.	impf. sbj	perf.	impf. ind.	impf. sbj
3m	ná:m	biná:m	yná:m	bá:n	bibá:n	ybə:n
3f	ná:met	bətná:m	tná:m	bá:net	bətbá:n	tbə:n
3p	ná:mu	biná:mu	yná:mu	bá:nu	bibá:nu	ybə:nu
2m	nəmət	bətná:m	tná:m	bənət	bətbá:n	tbə:n
2f	nəmti	bətná:mi	tná:mi	bənti	bətbá:ni	tbə:ni
2p	nəmtu	bətná:mu	tná:mu	bəntu	bətbá:nu	tbə:nu
1s	nəmət	bná:m	ná:m	bənət	bbá:n	bá:n
1p	nəmnə	mənná:m	nná:m	bənnə	mənbá:n	nbá:n
imp	ná:m, ná:mi, ná:mu			bá:n, bá:ni, bá:nu		

	‘fear’			‘contain’		
	perf.	impf. ind.	impf. subj	perf.	impf. ind.	impf. subj
3m	xá:f	bixá:f	yxá:f	sá:ʕ	bisá:ʕ	ysá:ʕ
3f	xá:fet	bətxá:f	txá:f	sá:ʕet	bətsá:ʕ	tsá:ʕ
3p	xá:fu	bixá:fu	yxá:fu	sá:ʕu	bisá:ʕu	ysá:ʕu
2m	xəfət	bətxá:f	txá:f	səʕət	bətsá:ʕ	tsá:ʕ
2f	xəfti	bətxá:fi	txá:fi	səʕti	bətsá:ʕi	tsá:ʕi
2p	xəftu	bətxá:fu	txá:fu	səʕtu	bətsá:ʕu	tsá:ʕu
1s	xəfət	bxá:f	xá:f	səʕət	bsá:ʕ	sá:ʕ
1p	xəfna	mənxá:f	nxá:f	səʕna	mənsá:ʕ	nsá:ʕ
imp	xá:f, xá:fi, xá:fu			sá:ʕ, sá:ʕi, sá:ʕu		

We will first take on the perfective conjugation. The alternation that needs to be accounted for in this tense is between Ca:C and CəC. Stems of the shape Ca:C appear either when there is no suffix, or before the suffixes *-u* and *-et*, and stems of the shape CəC are found before suffixes of the shape CV and əC. This distribution can be regularized by modifying our assumption about the underlying form of the suffixes for 2m and 1s which seem to be /ət/. It was previously noted that there are no clusters of three consonants in the language and that such clusters, when created, are broken up by insertion of the vowel schwa. There are also no clusters of the form CC at the end of a word (except identical consonant clusters). This fact raises the possibility that these suffixes are really /t/, and that the vowel is epenthetic. If that is the case, then the distribution of the two stem variants, Ca:C and CəC can be stated simply as: Ca:C becomes CəC before a consonant-initial suffix. This allows us to posit the following rule.

(24) *Pre-cluster shortening*

V: → ə / ____ CC

Furthermore, assuming that the 2m and 1s suffixes are really /t/ and that their vowel is epenthetic now allows us to make more sense of the stress pattern of the language. Pursuing that assumption, examples of stress in the perfective and imperfective tenses of ‘ask’ are given, without the epenthetic vowel.

(25)	3m	sáʔal	b-yə-sʔal
	3f	sáʔl-et	b-tə-sʔal
	3p	sáʔal-u	b-yə-sʔal-u
	2m	saʔál-t	b-tə-sʔal
	2f	saʔál-ti	b-tə-sʔal-i
	2p	saʔál-tu	b-tə-sʔal-u
	1s	saʔál-t	b-ə-sʔal
	1p	saʔál-na	m-nə-sʔal

From this, we can see that stress falls on the final vowel if it is followed by two consonants, otherwise on the penult if that vowel is followed by two consonants, and on the antepenult if neither of the following vowels are followed by two consonants. In order to be consistent with the theory of stress assignment, and because additional data will be better accounted for if we do so, we restate the generalization not directly in terms of counting consonants, but rather in terms of an abstract property of syllables, namely we will distinguish between light and heavy syllables. In Syrian Arabic, heavy syllables are ones containing a long vowel, or a short vowel plus a consonant, except that at the end of a word, a single final consonant does not suffice to make a syllable heavy, but two consonants do. Stated in those terms, the generalization regarding stress is that the rightmost heavy syllable is stressed. In the following rule, σ indicates ‘syllable’ and σ' indicates ‘light syllable’: this rule allows up to two light syllables to be skipped over in placing stress.

- (26) *Stress assignment*
 $\sigma \rightarrow \acute{\sigma} / _ ((\acute{\sigma})\acute{\sigma}) \#$

At this point, we can turn to the conjugation of CV:C verbs in the imperfective subjunctive. We see in (27) that while there is no alternation in the shape of the stem in the imperfective, there is variation in the shape of the prefix, compared to CVCVC verbs.

(27)		‘fear’	‘ask’
	3m	y-xá:f	yə-sʔal
	3f	t-xá:f	tə-sʔal
	3p	y-xá:fu	yə-sʔalu
	2m	t-xá:f	tə-sʔal
	2f	t-xá:fɪ	tə-sʔali
	2p	t-xá:fu	tə-sʔalu
	1s	xá:f	ʔə-sʔal
	1p	n-xá:f	nə-sʔal

The explanatory basis for most of this alternation is already available. Following the rule for stress assignment which we have proposed, we would expect to find forms, after stress is assigned, such as /yə-xá:f/, /yə-xá:f-u/. Stress is assigned to the stem vowel because it is long, in contrast to that of *yəsʔal*. These forms contain unstressed schwa in a closed syllable, which we have seen is subject to deletion. Given application of the schwa deletion rule, all forms of the imperfective subjunctive are accounted for, save for the 1s form.

As for the 1s imperfective form, recall that that prefix was assumed to be /ə/. Beginning with the underlying form /ə-xa:f/, stress assignment gives *əxá:f*, then schwa deletion gives the phonetic form *xá:f*. This then completes the analysis of the imperfective subjunctive, so we turn to the indicative, to see the effect of adding the prefix *b-*. Representative examples of indicative and subjunctive CV:C stems and indicative CVCVC stems are contrasted in (28).

(28)	fear (subjunct)	fear (indic)	ask (indic)
	3m y-xá:f	b-i-xá:f	b-yə-sʔal
	3f t-xá:f	bə-t-xá:f	b-tə-sʔal
	3p y-xá:fu	b-i-xá:fu	b-yə-sʔalu
	2m t-xá:f	bə-t-xá:f	b-tə-sʔal
	2f t-xá:fɪ	bə-t-xá:fɪ	b-tə-sʔali
	2p t-xá:fu	bə-t-xá:fu	b-tə-sʔalu
	1s xá:f	b-xá:f	b-ə-sʔal
	1p n-xá:f	mə-n-xá:f	m-nə-sʔal

Simply adding the indicative prefix to the subjunctive form *txá:f* would yield *btxá:f*, with a cluster of three consonants: the surface form derives by applying epenthesis. On the other hand, in the 1s form no such consonant cluster arises, and therefore no vowel is inserted. It should also be noted, given the surface form *mənxá:f* from /b-nə-xá:f/, that the rule of *b*-nasalization must apply before epenthesis, since the latter rule separates *b* and the triggering nasal consonant.

Another set of forms to be concerned with in the indicative paradigm of CV:C verbs is *bixá:f*, *bixá:fu*. From the underlying forms /b-yə-xá:f/, /b-yə-xá:f-u/ we would expect to derive *bəyxá:f(u)*, considering only stress assignment, ə-deletion, and epenthesis. In addition, however, we have the rule of glide vocalization which should apply to these forms giving *bi:xá:f(u)*. This is almost the correct output, except for

vowel length. At this point it is not clear whether the shortening of the first vowel is due to it standing before another long vowel, or is due to being unstressed. We will assume the latter explanation, and will seek further evidence for that choice below.

(29) *Unstressed shortening*

V
[-stress] → [-long]

Finally, it should be noted that in the imperative, the stem vowel is long in the singular masculine where no affix added, and in the feminine and plural forms where a -V suffix is added. This contrasts with stems such as *któ:b* ~ *ktábi*: the difference is that in *któ:b* vowel length is assigned to satisfy the word minimality requirement but in *xá:f* ~ *xá:fi* the stem has an underlying long vowel. This then complete the analysis of CV:C stems having the vocalic pattern *a* ~ *a*.

In (30) are given examples of CV:C verbs with the vocalic pattern *a* for the perfective, *u* for the imperfective.

(30)

‘drive’				‘say’		
	perf.	impf. ind.	impf. sbj	perf.	impf. ind.	impf. sbj
3m	sá:ʔ	bisú:ʔ	ysú:ʔ	ʔá:l	biʔú:l	yʔú:l
3f	sá:ʔet	bətsú:ʔ	tsú:ʔ	ʔá:let	bətʔú:l	tʔú:l
3p	sá:ʔu	bisú:ʔu	ysú:ʔu	ʔá:lu	biʔú:lu	yʔú:lu
2m	səʔət	bətsú:ʔ	tsú:ʔ	ʔələt	bətʔú:l	tʔú:l
2f	səʔti	bətsú:ʔi	tsú:ʔi	ʔəlti	bətʔú:li	tʔú:li
2p	səʔtu	bətsú:ʔu	tsú:ʔu	ʔəltu	bətʔú:lu	tʔú:lu
1s	səʔət	bsú:ʔ	sú:ʔ	ʔələt	bʔú:l	ʔú:l
1p	səʔna	mənsú:ʔ	nsú:ʔ	ʔəlna	mənʔú:l	nʔú:l
imp	sú:ʔ, sú:ʔi, sú:ʔu			ʔú:l, ʔú:li, ʔú:lu		

‘visit’				‘blame’		
	perf.	impf. ind.	impf. sbj	perf.	impf. ind.	impf. sbj
3m	zá:r	bizú:r	yzú:r	lá:m	bilú:m	ylú:m
3f	zá:ret	bətzú:r	tzú:r	lá:met	bətlú:m	tlú:m
3p	zá:ru	bizú:ru	yzú:ru	lá:mu	bilú:mu	ylú:mu
2m	zə:rət	bətzú:r	tzú:r	lə:mət	bətlú:m	tlú:m
2f	zərti	bətzú:ri	tzú:ri	ləmti	bətlú:mi	tlú:mi
2p	zərtu	bətzú:ru	tzú:ru	ləmtu	bətlú:mu	tlú:mu
1s	zə:rət	bzú:r	zú:r	ləmət	blú:m	lú:m
1p	zərna	mənzú:r	nzú:r	ləmna	mənlú:m	nlú:m
imp	zú:r, zú:ri, zú:ru			lú:m, lú:mi, lú:mu		

The importance of this set of verbs is the realization of the imperfective vowel. Previous verbs have presented [a], [o] and [e], and never *[u], *[i] as the vowel of the imperfective. With CV:C verbs, we find the long vowels [a:], [u:] and (below) [i:], never *[o], *[e]. This complementarity suggests that the tense-related vocalism reduces to a single, simpler system with just three vowels – /a,u,i/ – and derive mid vowel by a rule which is sensitive to vowel length.

(31) *Vowel Lowering*

V
[-long] → [-hi]

This predicts that there should be no short vowels [i], [u] in the language, which is wrong: cf. *bixá:f* ‘he fears’. This high vowel derives from a long vowel by unstressed vowel shortening, so this is not a serious counterexample. More problematic is that the suffixes *-u*, *-tu*, *-i*, *-ti* do not undergo lowering. There are three explanations for this. First, the suffixes might have underlying long vowels (shortened because they are unstressed), so escape lowering. The difficulty with this account is that it becomes hard to explain why these vowels are not stressed, when stress otherwise seeks the last heavy syllable. The second alternative is that lowering is morphologically restricted so that it does not affect suffixes. A third possibility is that reduction does not affect word-final vowels. Lacking evidence to choose between alternatives, we do not make a specific decision at this point.

The data in (32) provides examples of CV:C stems selecting the vocalic pattern *a ~ i*, to complement the preceding data on the pattern *a ~ u*.

(32)	‘wake up’			‘be absent’			
		perf.	impf. ind.	impf. subj	perf.	impf. ind.	impf. subj
	3m	fā:ʔ	bifi:ʔ	yfi:ʔ	ɣá:b	biɣi:b	yɣi:b
	3f	fā:ʔet	bətfi:ʔ	tfi:ʔ	ɣá:bet	bətyi:b	tyi:b
	3p	fā:ʔu	bifi:ʔu	yfi:ʔu	ɣá:bu	biɣi:bu	yɣi:bu
	2m	fəʔət	bətfi:ʔ	tfi:ʔ	ɣəbət	bətyi:b	tyi:b
	2f	fəʔti	bətfi:ʔi	tfi:ʔi	ɣəbti	bətyi:bi	tyi:bi
	2p	fəʔtu	bətfi:ʔu	tfi:ʔu	ɣəbtu	bətyi:bu	tyi:bu
	1s	fəʔət	bfi:ʔ	fi:ʔ	ɣəbət	bɣi:b	ɣi:b
	1p	fəʔna	mənfi:ʔ	nfi:ʔ	ɣəbna	mənɣi:b	nɣi:b
	imp	fi:ʔ, fi:ʔi, fi:ʔu			ɣi:b, ɣi:bi, ɣi:bu		
	‘remove’			‘live’			
		perf.	impf. ind.	impf. subj	perf.	impf. ind.	impf. subj
	3m	ʔá:m	biʔi:m	yʔi:m	ʕá:š	biʕi:š	yʕi:š
	3f	ʔá:met	bəʔi:m	tʔi:m	ʕá:šet	bəʕi:š	tʕi:š
	3p	ʔá:mu	biʔi:mu	yʔi:mu	ʕá:šu	biʕi:šu	yʕi:šu
	2m	ʔəmət	bəʔi:m	tʔi:m	ʕəšet	bəʕi:š	tʕi:š
	2f	ʔəmti	bəʔi:mi	tʔi:mi	ʕəšti	bəʕi:ši	tʕi:ši
	2p	ʔəmtu	bəʔi:mu	tʔi:mu	ʕəštu	bəʕi:šu	tʕi:šu
	1s	ʔəmət	bʔi:m	ʔi:m	ʕəšet	bʕi:š	ʕi:š
	1p	ʔəmnə	mənʔi:m	nʔi:m	ʕəšna	mənʕi:š	nʕi:š
	imp	ʔi:m, ʔi:mi, ʔi:mu			ʕi:š, ʕi:ši, ʕi:šu		

This then completes the analysis of CV:C verb stems.

1.5. CVCCVC stems

Another class of stems has the shape CVCCVC. The examples in (33) have the vowel *a* in the perfective and *i* in the imperfective.

(33)	‘close’			‘try’		
		perf.	impf. ind.	perf.	impf. ind.	impf. sbj
3m	sákkar	bisákker	tsákker	žárrab	bižárreb	tžárreb
3f	sákkaret	bətsákker	tsákker	žárrabet	bətžárreb	tžárreb
3p	sákkaru	bisákkru	ysákkru	žárrabu	bižárrbu	yžárrbu
2m	sakkárət	bətsákker	tsákker	žárrábət	bətžárreb	tžárreb
2f	sakkárti	bətsákkri	tsákkri	žárrábtı	bətžárrbi	tžárrbi
2p	sakkártu	bətsákkru	tsákkru	žárrábtu	bətžárrbu	tžárrbu
1s	sakkárət	bsákker	sákker	žárrábət	bžárreb	žárreb
1p	sakkárna	mənsákker	nsákker	žárrábna	mənžárreb	nžárreb
imp	sákker, sákkri, sákkru	žárreb, žárrbi, žárrbu				

This paradigm reinforces aspects of our analysis of vowel deletion. We saw two patterns of vowel deletion, one via an apocope rule deleting unstressed non-low vowels in an open syllable, and one via a syncope rule deleting unstressed *a* in an open syllable, when the vowel is preceded by VC. Underlying /sakkaret/ cannot undergo syncope of /a/ because the vowel is preceded by a consonant cluster; but, /yə-sakkir-u/ undergoes apocope of *i* despite the preceding consonant cluster.

1.6. CVCV Stems

Our next class of verb stems are those of the shape CVCV. Consideration of these stems will lead us to posit a new rule. We will start with verbs having *a* in all tenses: examples are given in (34).

(34)	‘read’			‘begin’		
	perf.	impf. ind.	impf. sbj	perf.	impf. ind.	impf. sbj
3m	ʔára	byəʔra	yəʔra	báda	byəbda	yəbda
3f	ʔáret	btəʔra	təʔra	bádet	btəbda	təbda
3p	ʔáru	byəʔru	yəʔru	bádu	byəbdu	yəbdu
2m	ʔaré:t	btəʔra	təʔra	badé:t	btəbda	təbda
2f	ʔaré:ti	btəʔri	təʔri	badé:ti	btəbdi	təbdi
2p	ʔaré:tu	btəʔru	təʔru	badé:tu	btəbdu	təbdu
1s	ʔaré:t	bəʔra	ʔəʔra	badé:t	bəbda	ʔəbda
1p	ʔaré:na	mnəʔra	nəʔra	badé:na	mnəbda	nəbda
imp	ʔra:, ʔri:, ʔru:			bda:, bdi:, bdu:		

	‘disobey’			‘grow’		
	perf.	impf. ind.	impf. sbj	perf.	impf. ind.	impf. sbj
3m	ʕáʕa	byəʕʕa	yəʕʕa	náma	byənma	yənma
3f	ʕáʕet	btəʕʕa	təʕʕa	námet	btənma	tənma
3p	ʕáʕu	byəʕʕu	yəʕʕu	námu	byənmu	yənmu
2m	ʕaʕé:t	btəʕʕa	təʕʕa	namé:t	btənma	tənma
2f	ʕaʕé:ti	btəʕʕi	təʕʕi	namé:ti	btənmi	tənmi
2p	ʕaʕé:tu	btəʕʕu	təʕʕu	namé:tu	btənmu	tənmu
1s	ʕaʕé:t	bəʕʕa	ʔəʕʕa	namé:t	bənma	ʔənma
1p	ʕaʕé:na	mnəʕʕa	nəʕʕa	namé:na	mnənma	nənma
imp	ʕʕa:, ʕʕi:, ʕʕu:			nma:, nmi:, nmu:		

In the perfective tense, we encounter a number of alternations at the juncture of the stem final vowel *a* and a following suffix. On the one hand, if the following suffix begins with a vowel, the stem vowel *a* is

deleted; thus underlying *ʔara-et* and *ʔara-u* surface as *ʔar-et* and *ʔar-u*, due to the following rule. We note that there are no clusters of vowels in any of our data for this language.

(35) *Vowel cluster simplification*

$$V \rightarrow \emptyset / __ V$$

On the other hand, when the stem is followed by a consonant-initial suffix, the final stem vowel becomes [e:]. We will tentatively formalize this rule as in (36), but will re-analyze this process when additional data is available.

(36) $a \rightarrow e: / __ + C$

Note that the 2m and 1s suffixes, which appear as *-ət* when added to a consonant final stem, pattern with other consonant initial suffixes in triggering this rule. We have seen other evidence supporting the claim that the schwa in these suffixes is epenthetic, since these suffixes pattern with other consonant initial suffixes with respect to stress assignment and the shortening of stem vowels in CV:C verbs.

The derivation of imperfective forms does not pose any particular challenge, given that we have motivated a rule deleting a stem vowel before a suffix vowel. Surface [byəʔra] derives from /b-yə-ʔra/ by stress assignment, and /b-yə-ʔra-u/ becomes [byəʔru] by vowel cluster reduction and stress. The imperative forms *ʔrá:*, *ʔrí:*, *ʔrú:* merit a brief comment. These derive from /ʔra/, /ʔra-i/, /ʔra-u/. Vowel cluster reduction and stress apply to give *ʔrá:*, *ʔrí:*, *ʔrú:*, and lengthening the of vowel in subminimal words then accounts for the long vowel in these forms.

The next set of stems that we will consider are those with *a* in the perfective and *i* in the imperfective, examples being given in (37).

(37)	‘build’			‘invoke’		
	perf.	impf. ind.	impf. subj	perf.	impf. ind.	impf. subj
3m	bána	byəbni	yəbni	dáʕa	byədʕi	yədʕi
3f	bánet	btəbni	təbni	dáʕet	btədʕi	tədʕi
3p	bánu	byəbnu	yəbnu	dáʕu	byədʕu	yədʕu
2m	bané:t	btəbni	təbni	daʕé:t	btədʕi	tədʕi
2f	bané:ti	btəbni	təbni	daʕé:ti	btədʕi	tədʕi
2p	bané:tu	btəbnu	təbnu	daʕé:tu	btədʕu	tədʕu
1s	bané:t	bəbni	ʔəbni	daʕé:t	bədʕi	ʔədʕi
1p	bané:na	mnəbni	nəbni	daʕé:na	mnədʕi	nədʕi
imp	bní:, bní:, bnú:			dʕí:, dʕí:, dʕú:		

	‘extinguish’			‘speak’		
	perf.	impf. ind.	impf. subj	perf.	impf. ind.	impf. subj
3m	táfa	byəʔfi	yəʔfi	háka	byəhki	yəhki
3f	táfet	btəʔfi	təʔfi	háket	btəhki	təhki
3p	táfu	byəʔfu	yəʔfu	háku	byəhku	yəhku
2m	tafé:t	btəʔfi	təʔfi	haké:t	btəhki	təhki
2f	tafé:ti	btəʔfi	təʔfi	haké:ti	btəhki	təhki
2p	tafé:tu	btəʔfu	təʔfu	haké:tu	btəhku	təhku
1s	tafé:t	bəʔfi	ʔəʔfi	haké:t	bəhki	ʔəhki
1p	tafé:na	mnəʔfi	nəʔfi	haké:na	mnəhki	nəhki
imp	tí:, tí:, tífú:			hki:, hki:, hkú:		

The perfectives are parallel to the perfectives of *ʔara* etc. so they require no comment. The imperfectives derive simply, given the rule of vowel cluster reduction and the underlying vowel which they select in the imperfective. Underlying /tə-bni/ surfaces as [təbni] ‘she built’, and /tə-bni-i/ surfaces as homophonous [təbni] ‘you f. built’ (cf. /tə-ʔra/ → [təʔra] ‘she read’, /tə-ʔra-i/ → [təʔri] ‘you f. read’).

A third class of vowel final verbs select the vowel *i* in the perfective and *a* in the imperfective.

(38)	‘stay’			‘get stuck’		
	perf.	impf. ind.	impf. sbj	perf.	impf. ind.	impf. sbj
3m	bəʔi	byəbʔa	yəbʔa	šəfi	byəšfa	yəšfa
3f	bəʔyet	btəbʔa	təbʔa	šəfyet	btəšfa	təšfa
3p	bəʔyu	byəbʔu	yəbʔu	šəfyu	byəšfu	yəšfu
2m	bʔi:t	btəbʔa	təbʔa	šfi:t	btəšfa	təšfa
2f	bʔi:ti	btəbʔi	təbʔi	šfi:ti	btəšfi	təšfi
2p	bʔi:tu	btəbʔu	təbʔu	šfi:tu	btəšfu	təšfu
1s	bʔi:t	bəbʔa	ʔəbʔa	šfi:t	bəšfa	ʔəšfa
1p	bʔi:na	mnəbʔa	nəbʔa	šfi:na	mnəšfa	nəšfa
imp	bʔá:, bʔí:, bʔú:			šfá:, šfí:, šfú:		

The inflection of the imperfective of these verbs is exactly identical to that of *a ~ a* verbs like *ʔara*. The perfective on the other hand requires some analysis. We can see that before a vowel-initial suffix in the perfective, the final vowel becomes the glide *y*. Thus, /bəʔi-et/ becomes [bəʔyet] and /bəʔi-u/ becomes [bəʔyu]. Obvious, a rule of glide formation is at work in these data. However, we must ask why no glide formation was found in apparently parallel forms such as /tə-bni-u/ → [təbnu] ‘you pl. built’. The answer is that the forms are not entirely parallel, and the crucial difference is the number of consonants appearing before the stem final vowel. In the case of /bəʔi-et/, Glide Formation can apply without creating an illicit sequence of three consonants, so [bəʔyet] results. In /tə-bni-u/ on the other hand, were Glide Formation to apply, illicit *[təbnyu] with a CCC sequence would result. Therefore, we must constrain Glide Formation so that its application does not result in three consonants.

(39) *Glide Formation*

V
[+hi] → [-syllabic] / V C ____ V

A final set of CVCV verbs will be considered here, namely those whose initial consonant is a glide. We have previously seen that initial glides are subject to a vocalization process in imperfective forms, and CVCV verbs are subject to such a process. The verb in (40) illustrates the conjugation of a verbs with the vowel pattern *i ~ a*.

(40)	‘be low’		
	perf.	impf. ind.	impf. sbj
3m	wəʔi	byú:ʔa	yú:ʔa
3f	wəʔyet	btú:ʔa	tú:ʔa
3p	wəʔyu	byú:ʔu	yú:ʔu
2m	wʔi:t	btú:ʔa	tú:ʔa
2f	wʔi:ti	btú:ʔi	tú:ʔi
2p	wʔi:tu	btú:ʔa	tú:ʔa
1s	wʔi:t	bú:ʔa	ʔú:ʔa
1p	wʔi:na	mnú:ʔa	nú:ʔa
imp	wʔá:, wʔí:, wʔú:		

Glide vocalization applies as expected in the imperfective. Underlying /b-yə-wṭa-i/ undergoes stress assignment and vowel cluster reduction to give intermediate *byəwṭi*, which then undergoes glide vocalization to give surface [byu:ti]

The examples in (41) involve a verb with *a* in the perfective and *i* in the imperfective.

(41)	perf.	impf. ind.	impf. sbj
3m	wáfa	byú:fi	yú:fi
3f	wáfet	btú:fi	tú:fi
3p	wáfu	byú:fu	yú:fu
2m	wafé:t	btú:fi	tú:fi
2f	wafé:ti	btú:fi	tú:fi
2p	wafé:tu	btú:fu	tú:fu
1s	wafé:t	bú:fi	?ú:fi
1p	wafé:na	mnú:fi	nú:fi
imp	wfí:, wfi:, wfú:		

The perfective forms are just like other CVCV verbs having the vowel *a*. The imperfective forms can also be derived from the rules available. The form [yú:fi] derives from underlying /yə-wfi/; stress assignment gives the intermediate form [yəwfi], and the derivation of this form is completed by applying glide vocalization. The form [yú:fu] derives from /yə-wfi-u/ analogously. The rules applicable here are stress assignment, glide vocalization, and vowel cluster reduction. Note that glide formation might, in principle, apply to /yə-wfi-u/, but does not. Evidently, the verb has a consonant cluster at the stage where Glide Formation might apply, and that consonant cluster prevents Glide Formation from applying. Later, Glide vocalization eliminates the glide from the surface, but this process is ordered after the decision has been made to not apply Glide Formation.

1.6.1. CVCC STEMS

The final class of verbs which will be considered are those of the shape CVCC, where the final two consonants are identical. Examples with a verb selecting *a* in the two tenses are given in (42).

(42)	‘remain’			‘remain’		
	perf.	impf. ind.	impf. sbj	perf.	impf. ind.	impf. sbj
3m	támm	bitámm	ytámm	ḏáll	biḏáll	yḏáll
3f	támmet	bəttámm	ttámm	ḏállət	bəḏáll	tḏáll
3p	támmu	bitámmu	ytámmu	ḏállu	biḏállu	yḏállu
2m	tammé:t	bəttámm	ttámm	ḏállé:t	bəḏáll	tḏáll
2f	tammé:ti	bəttámmi	ttámmi	ḏállé:ti	bəḏállli	tḏállli
2p	tammé:tu	bəttámmu	ttámmu	ḏállé:tu	bəḏálllu	tḏálllu
1s	tammé:t	btámm	támm	ḏállé:t	bḏáll	ḏáll
1p	tammé:na	məntámm	ntámm	ḏállé:na	məḏáll	nḏáll
imp	támm, támmi, támmu			ḏáll, ḏállli, ḏállu		

The aspect of these verbs which is most in need of comment is the fact that in the perfective tense, epenthetic *e:* is found before consonant initial suffixes. We have previously encountered this *e:* in the conjugation of CVCV verbs, where we assumed that it represented a change of the underlying vowel to *e:*. However, another possibility is that with CVCV verbs, *e:* is inserted, giving intermediate *?arae:t*, and then vowel cluster reduction applies to give the surface form. The appearance of *e:* in the same context with

CVCC verbs give credence to that analysis. What remains to be clarified is the context where *e*: is inserted: we find *e*: inserted after stems of the form CVCC and CVCV, as expressed in the following rule.

(43) *Stem augmentation*

$$\emptyset \rightarrow e: / \text{CVC} \left\{ \begin{array}{c} \text{C} \\ \text{V} \end{array} \right\} _ + \text{C}$$

The rules which have been motivated here, and the important orderings, are summarized below. A number of rules can be assumed to apply relatively early, and their specific ordering is not particularly important.

<i>Syncope</i>	$a \rightarrow \emptyset / \text{VC} _ \text{Ce}$
<i>Nasalization</i>	$b \rightarrow [+nasal] / _ [+nasal]$
<i>Lengthening</i>	$V \rightarrow \text{VV} / \# \text{C}_0 _ \text{C}\#$
<i>Stem augmentation</i>	$\emptyset \rightarrow e: / \text{CVC} \left\{ \begin{array}{c} \text{C} \\ \text{V} \end{array} \right\} _ + \text{C}$
<i>Stress assignment</i>	$\sigma \rightarrow \acute{\sigma} / _ ((\acute{\sigma})\sigma) \#$
<i>Pre-cluster shortening</i>	$V: \rightarrow \text{ə} / _ \text{CC}$

For other rules, the order of application becomes more important.

	V
Nonlow vowel deletion	$\left[\begin{array}{c} -\text{stress} \\ -\text{low} \end{array} \right] \rightarrow \emptyset / _ \text{CV}$
Glottal Prothesis	$\emptyset \rightarrow ? / \# _ \text{V}$
Epenthesis	$\emptyset \rightarrow \text{ə} / \text{C} _ \text{CC}$
Glide Vocalization	$\text{ə w C} \rightarrow \text{u: C}$
Vowel lowering	V
	$[-\text{long}] \rightarrow [-\text{hi}]$
Mid vowel reduction	$e, o \rightarrow \text{ə} / _ \text{C}_0 \text{V}$
Unstressed shortening	V
	$[-\text{stress}] \rightarrow [-\text{long}]$
Glide Formation	V
	$[+\text{hi}] \rightarrow [-\text{syllabic}] / \text{VC} _ \text{V}$
Vowel cluster simplification	$V \rightarrow \emptyset / _ \text{V}$