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. *-ktob* impf. 'write'), while others use *a* in the perfective and *e* in the imperfective (*ħamal* perf. *-ħmel* impf. 'carry'), and others use *e* in the perfective and *a* in the imperfective (*ʔəbel* 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)

	perf.	*imperf. subjunctive*	*imperative*
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-	

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. sbj	perf.	impf. ind.	impf. sbj
3m	sáʔal	byə́sʔal	yə́sʔal	fátaħ	byə́ftaħ	yə́ftaħ

3f	sáʔlet	btəsʔal	təsʔal	fáṯet	btəftaħ	təftaħ
3p	sáʔalu	byəsʔalu	yəsʔalu	fátaħu	byəftaħu	yəftaħu
2m	saʔáləṯ	btəsʔal	təsʔal	fatáħəṯ	btəftaħ	təftaħ
2f	saʔálti	btəsʔali	təsʔali	fatáħti	btəftaħi	təftaħi
2p	saʔáltu	btəsʔalu	təsʔalu	fatáħtu	btəftaħu	təftaħu
1s	saʔáləṯ	bəsʔal	ʔəsʔal	fatáħəṯ	bəftaħ	ʔəftaħ
1p	saʔálna	mnəsʔal	nəsʔal	fatáħna	mnəftaħ	nəftaħ
imp	sʔá:l, sʔáli, sʔálu			ftá:ħ, ftáħi, ftáħu		
(masc sg, fem sg, pl)						

	‘send’			‘keep’		
	perf.	impf. ind.	impf. sbj	perf.	impf. ind.	impf. sbj
3m	báʕat	byəbʕat	yəbʕat	ħáfaẓ	byəħfaẓ	yəħfaẓ
3f	báʕtet	btəbʕat	təbʕat	ħáfẓet	btəħfaẓ	təħfaẓ
3p	báʕatu	byəbʕatu	yəbʕatu	ħáfaẓu	byəħfaẓu	yəħfaẓu
2m	baʕátəṯ	btəbʕat	təbʕat	ħafáẓəṯ	btəħfaẓ	təħfaẓ
2f	baʕátti	btəbʕati	təbʕati	ħafáẓti	btəħfaẓi	təħfaẓi
2p	baʕáttu	btəbʕatu	təbʕatu	ħafáẓtu	btəħfaẓu	təħfaẓu
1s	baʕátəṯ	bəbʕat	ʔəbʕat	ħafáẓəṯ	bəħfaẓ	ʔəħfaẓ
1p	baʕátna	mnəbʕat	nəbʕat	ħafáẓna	mnəħfaẓ	nəħfaẓ
imp	bʕá:t, bʕáti, bʕátu			ħfá:ẓ, ħfáẓi, ħfáẓu		

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 → Ø / 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 → [+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-* (*básʔal*). 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 *btásʔal* 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*
Ø → 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 → 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. sbj	perf.	impf. ind.	impf. sbj
3m	kátab	byáktob	yáktob	ʔámar	byáʔmor	yáʔmor
3f	kátbet	btáktob	táktob	ʔámret	btáʔmor	táʔmor
3p	kátabu	byákətbu	yákətbu	ʔámaru	byáʔəmru	yáʔəmru
2m	katábət	btáktob	táktob	ʔamárət	btáʔmor	táʔmor
2f	katábti	btákətbi	tákətbi	ʔamárti	btáʔəmri	táʔəmri
2p	katábtu	btákətbu	tákətbu	ʔamártu	btáʔəmru	táʔəmru
1s	katábət	báktob	ʔáktob	ʔamárət	báʔmor	ʔáʔmor
1p	katábna	mnáktob	náktob	ʔamárna	mnáʔmor	náʔmor
imp	któ:b, ktábi, ktábu			ʔmó:r, ʔmári, ʔmáru		

	‘study’			‘cook’		
	perf.	impf. ind.	impf. sbj	perf.	impf. ind.	impf. sbj
3m	dáras	byádros	yádros	ṭábax	byáṭbox	yáṭbox
3f	dárset	btádros	tádros	ṭábxet	btáṭbox	táṭbox
3p	dárasu	byádərsu	yádərsu	ṭábaxu	byáṭəbxu	yáṭəbxu
2m	darásət	btádros	tádros	ṭabáxət	btáṭbox	táṭbox
2f	darásti	btádərsi	tádərsi	ṭabáxti	btáṭəbxi	táṭəbxi
2p	darástu	btádərsu	tádərsu	ṭabáxtu	btáṭəbxu	táṭəbxu

1s	darásət	bə́dros	ʔə́dros	ṭabáxət	bə́ṭbox	ʔə́ṭbox
1p	darásna	mnə́dros	nə́dros	ṭabáxna	mnə́ṭbox	nə́ṭbox
imp	dró:s, drəsi, drəsu			ṭbó:x, ṭbə́xi, ṭbə́xu		

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*
Ø → 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/ → *ktə́bi*. 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 tenatively assume the following rule.

(9) *Mid vowel reduction*
e,o → 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	ħámal	byə́ħmel	yə́ħmel	ʔásam	byə́ʔsem	yə́ʔsem
3f	ħámlet	btə́ħmel	tə́ħmel	ʔásmet	btə́ʔsem	tə́ʔsem
3p	ħámalu	byə́ħəmlu	yə́ħəmlu	ʔásamu	byə́ʔəsmu	yə́ʔəsmu
2m	ħamálət	btə́ħmel	tə́ħmel	ʔasámət	btə́ʔsem	tə́ʔsem
2f	ħamálti	btə́ħəmli	tə́ħəmli	ʔasámti	btə́ʔəsmi	tə́ʔəsmi
2p	ħamáltu	btə́ħəmlu	tə́ħəmlu	ʔasámtu	btə́ʔəsmu	tə́ʔəsmu
1s	ħamálət	bə́ħmel	ʔə́ħmel	ʔasámət	bə́ʔsem	ʔə́ʔsem

1p	ħamálna	mnə́ħmel	nə́ħmel	ʔasámna	mnə́ʔsem	nə́ʔsem
imp	ħmé:l, ħmə́li, ħmə́lu			ʔsé:m, ʔsə́mi, ʔsə́mu		

	‘wash’			‘grasp’		
	perf.	impf. ind.	impf. sbj	perf.	impf. ind.	impf. sbj
3m	ɣásal	byə́ɣsel	yə́ɣsel	kámaš	byə́kmeš	yə́kmeš
3f	ɣáslet	btə́ɣsel	tə́ɣsel	kámšet	btə́kmeš	tə́kmeš
3p	ɣásalu	byə́ɣəslu	yə́ɣəslu	kámašu	byə́kəmšu	yə́kəmšu
2m	ɣasálət	btə́ɣsel	tə́ɣsel	kamášət	btə́kmeš	tə́kmeš
2f	ɣasálti	btə́ɣəsli	tə́ɣəsli	kamášti	btə́kəmši	tə́kəmši
2p	ɣasáltu	btə́ɣəslu	tə́ɣəslu	kamáštu	btə́kəmšu	tə́kəmšu
1s	ɣasálət	bə́ɣsel	ʔə́ɣsel	kamášət	bə́kmeš	ʔə́kmeš
1p	ɣasálna	mnə́ɣsel	nə́ɣsel	kamášna	mnə́kmeš	nə́kmeš
imp	ɣsé:l, ɣsə́li, ɣsə́lu			kmé:š, kmə́ši, kmə́šu		

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. sbj	perf.	impf. ind.	impf. sbj
3m	nə́zel	byə́nzel	yə́nzel	mə́sek	byə́msek	yə́msek
3f	nə́zlet	btə́nzel	tə́nzel	mə́sket	btə́msek	tə́msek
3p	nə́zlu	byə́nəzlu	yə́nəzlu	mə́sku	byə́məsku	yə́məsku
2m	nzə́lət	btə́nzel	tə́nzel	msə́kət	btə́msek	tə́msek
2f	nzə́ltu	btə́nəzli	tə́nəzli	msə́ktu	btə́məski	tə́məski
2p	nzə́lti	btə́nəzlu	tə́nəzlu	msə́kti	btə́məsku	tə́məsku
1s	nzə́lət	bə́nzel	ʔə́nzel	msə́kət	bə́msek	ʔə́msek
1p	nzə́lna	mnə́nzel	nə́nzel	msə́kna	mnə́msek	nə́msek
imp	nzé:l, nzə́li, nzə́lu			msé:k, msə́ki, msə́ku		

	‘dress’			‘be able’		
	perf.	impf. ind.	impf. sbj	perf.	impf. ind.	impf. sbj
3m	lə́bes	byə́lbes	yə́lbes	ʔə́der	byə́ʔder	yə́ʔder
3f	lə́bset	btə́lbes	tə́lbes	ʔə́dret	btə́ʔder	tə́ʔder
3p	lə́bsu	byə́ləbsu	yə́ləbsu	ʔə́dru	byə́ʔədru	yə́ʔədru
2m	lbə́sət	btə́lbes	tə́lbes	ʔdə́rət	btə́ʔder	tə́ʔder
2f	lbə́stu	btə́ləbsi	tə́ləbsi	ʔdə́rtu	btə́ʔədri	tə́ʔədri
2p	lbə́sti	btə́ləbsu	tə́ləbsu	ʔdə́rti	btə́ʔədru	tə́ʔədru
1s	lbə́sət	bə́lbes	ʔə́lbes	ʔdə́rət	bə́ʔder	ʔə́ʔder
1p	lbə́sna	mnə́lbes	nə́lbes	ʔdə́rna	mnə́ʔder	nə́ʔder
imp	lbé:s, lbə́si, lbə́su			ʔdé:r, ʔdə́ri, ʔdə́ru		

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

(12)

3m	nəzel	kátab
3f	nəzlet	kátbet
3p	nəzlu	kátabu
2m	nzələt	katábət
2f	nzəltu	katábti
2p	nzəlti	katábtu
1s	nzələt	katábət
1p	nzəlna	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 *nzəltu* 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. *nə́zel* ~ *názlu*, and *nə́zel* ~ *nzəltu*. 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	nəzel		3f	nəzəl-et
3p	nəzəl-u		2m	nəzəl-ət
2f	nəzəl-tu		2p	nəzəl-ti
1s	nəzəl-ət		1p	nəzəl-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*

$$\overset{\text{V}}{\begin{bmatrix} \text{- stress} \\ \text{- low} \end{bmatrix}} \rightarrow \varnothing \,/\, \_\_\, \text{CV}$$

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 ~ Ø alternation of stems like *nəzel*, and a rule which accounts for the *e* ~ *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	fhəmət	btəfham	təfham
2f	ʔbəlti	btəʔbali	təʔbali	fhəmti	btəfhami	təfhami
2p	ʔbəltu	btəʔbalu	təʔbalu	fhəmtu	btəfhamu	təfhamu
1s	ʔbələt	bəʔbal	ʔəʔbal	fhəmət	bəfham	ʔəfham
1p	ʔbəlna	mnəʔbal	nəʔbal	fhəmna	mnəfham	nəfham
imp	ʔbə́:l, ʔbáli, ʔbálu			fhá:m, fhámi, fhámu		

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	wáḍaʕ	byú:ḍaʕ	yú:ḍaʕ	wádaʕ	byú:daʕ	yú:daʕ
3f	wáḍʕet	btú:ḍaʕ	tú:ḍaʕ	wádʕet	btú:daʕ	tú:daʕ
3p	wáḍaʕu	byú:daʕu	yú:daʕu	wádaʕu	byú:daʕu	yú:daʕu
2m	waḍáʕət	btú:ḍaʕ	tú:ḍaʕ	wadáʕət	btú:daʕ	tú:daʕ
2f	waḍáʕti	btú:ḍaʕi	tú:ḍaʕi	wadáʕti	btú:daʕi	tú:daʕi
2p	waḍáʕtu	btú:ḍaʕu	tú:ḍaʕu	wadáʕtu	btú:daʕu	tú:daʕu
1s	waḍáʕət	bú:ḍaʕ	ʔú:ḍaʕ	wadáʕət	bú:daʕ	ʔú:daʕ
1p	waḍáʕna	mnú:ḍaʕ	nú:ḍaʕ	wadáʕna	mnú:daʕ	nú:daʕ
imp	wḍa:ʕ, wḍaʕi, wḍaʕu			wda:ʕ, wdaʕi, wdaʕu		

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:ḍaʕ	yə́-sʔal
3f	t-ú:ḍaʕ	tə́-sʔal
3p	y-ú:daʕu	yə́-sʔalu
2m	t-ú:ḍaʕ	tə́-sʔal
2f	t-ú:ḍaʕi	tə́-sʔali
2p	t-ú:ḍaʕu	tə́-sʔalu
1s	ʔ-ú:ḍaʕ	ʔə́-sʔal
1p	n-ú:ḍaʕ	nə́-sʔal

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

(18)

3m	*yə́wḍaʕ	3f	*tə́wḍaʕ
3p	*yə́wdaʕu	2m	*tə́wḍaʕ
2f	*tə́wḍaʕi	2p	*tə́wḍaʕu
1s	*ʔə́wḍaʕ	1p	*nə́wḍaʕ

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. sbj	perf.	impf. ind.	impf. sbj
3m	wáṣaf	byú:ṣef	yú:ṣef	wáʕad	byú:ʕed	yú:ʕed
3f	wáṣfet	btú:ṣef	tú:ṣef	wáʕdet	btú:ʕed	tú:ʕed
3p	wáṣafu	byú:ṣfu	yú:ṣfu	wáʕadu	byú:ʕdu	yú:ʕdu
2m	waṣáfət	btú:ṣef	tú:ṣef	waʕádət	btú:ʕed	tú:ʕed
2f	waṣáfti	btú:ṣfi	tú:ṣfi	waʕádti	btú:ʕdi	tú:ʕdi
2p	waṣáftu	btú:ṣfu	tú:ṣfu	waʕádtu	btú:ʕdu	tú:ʕdu
1s	waṣáfət	bú:ṣef	ʔú:ṣef	waʕádət	bú:ʕed	ʔú:ʕed
1p	waṣáfna	mnú:ṣef	nú:ṣef	waʕádna	mnú:ʕed	nú:ʕed
imp	wṣé:f, wṣə́fi, wṣə́fu			wʕé:d, wʕə́di, wʕə́du		

Apart from the vocalization of root initial *w* with *ə*, these verbs behave just like roots such as *ħamal*. 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	wə́ʔeʕ	byú:ʔaʕ	yú:ʔaʕ	wə́ṣel	byú:ṣal	yú:ṣal
3f	wə́ʔʕet	btú:ʔaʕ	tú:ʔaʕ	wə́ṣlet	btú:ṣal	tú:ṣal
3p	wə́ʔʕu	byú:ʔaʕu	yú:ʔaʕu	wə́ṣlu	byú:ṣalu	yú:ṣalu
2m	wʔéʕət	btú:ʔaʕ	tú:ʔaʕ	wṣélət	btú:ṣal	tú:ṣal
2f	wʔéʕti	btú:ʔaʕi	tú:ʔaʕi	wṣélti	btú:ṣali	tú:ṣali
2p	wʔéʕtu	btú:ʔaʕu	tú:ʔaʕu	wṣéltu	btú:ṣalu	tú:ṣalu
1s	wʔéʕət	bú:ʔaʕ	ʔú:ʔaʕ	wṣélət	bú:ṣal	ʔú:ṣal
1p	wʔéʕna	mnú:ʔaʕ	nú:ʔaʕ	wṣélna	mnú:ṣal	nú:ṣal
imp	wʔá:ʕ, wʔáʕi, wʔáʕu			wṣá:l, wṣáli, wṣálu		

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	yə́bes	byí:bas	yí:bas
3f	yə́bset	btí:bas	tí:bas
3p	yə́bsu	byí:basu	yí:basu
2m	ybə́sət	btí:bas	tí:bas
2f	ybə́sti	btí:basi	tí:basi
2p	ybə́stu	btí:basu	tí:basu
1s	ybə́sət	bí:bas	ʔí:bas
1p	ybə́sna	mní:bas	ní:bas
imp	ybá:s, ybási, ybásu		

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	ybá:n
3f	ná:met	bətná:m	tná:m	bá:net	bətbá:n	tbá:n
3p	ná:mu	biná:mu	yná:mu	bá:nu	bibá:nu	ybá:nu
2m	nə́mət	bətná:m	tná:m	bə́nət	bətbá:n	tbá:n
2f	nə́mti	bətná:mi	tná:mi	bə́nti	bətbá:ni	tbá:ni
2p	nə́mtu	bətná:mu	tná:mu	bə́ntu	bətbá:nu	tbá:nu
1s	nə́mət	bná:m	ná:m	bə́nət	bbá:n	bá:n
1p	nə́mna	mənná:m	nná:m	bə́nna	mənbá:n	nbá:n
imp	ná:m, ná:mi, ná:mu			bá:n, bá:ni, bá:nu		

	‘fear’			‘contain’		
	perf.	impf. ind.	impf. sbj	perf.	impf. ind.	impf. sbj
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 *ə*C. 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-yə́-sʔal
	3f	sáʔl-et	b-tə́-sʔal
	3p	sáʔal-u	b-yə́-sʔal-u
	2m	saʔál-t	b-tə́-sʔal
	2f	saʔál-ti	b-tə́-sʔal-i
	2p	saʔál-tu	b-tə́-sʔal-u
	1s	saʔál-t	b-ə́-sʔal
	1p	saʔál-na	m-nə́-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 σ̆ indicates ‘light syllable’: this rule allows up to two light syllables to be skipped over in placing stress.

(26) *Stress assignment*
σ → σ́ / __ ((σ̆)σ̆) #

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	yə́-sʔal
3f	t-xá:f	tə́-sʔal
3p	y-xá:fu	yə́-sʔalu
2m	t-xá:f	tə́-sʔal
2f	t-xá:fi	tə́-sʔali
2p	t-xá:fu	tə́-sʔalu
1s	xá:f	ʔə́-sʔal
1p	n-xá:f	nə́-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 *yə́sʔal*. 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-yə́-sʔal
3f	t-xá:f	bə-t-xá:f	b-tə́-sʔal
3p	y-xá:fu	b-i-xá:fu	b-yə́-sʔalu
2m	t-xá:f	bə-t-xá:f	b-tə́-sʔal
2f	t-xá:fi	bə-t-xá:fi	b-tə́-sʔali
2p	t-xá:fu	bə-t-xá:fu	b-tə́-sʔalu
1s	xá:f	b-xá:f	b-ə́-sʔal
1p	n-xá:f	mə-n-xá:f	m-nə́-sʔal

Simply adding the indicative prefix to the subjunctive form *txa: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 corect 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*

$$\underset{[\text{-stress}]}{\overset{\text{V}}{}} \rightarrow [\text{-long}]$$

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 ~ któbi*: 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	sáʔət	bətsú:ʔ	tsú:ʔ	ʔálət	bətʔú:l	tʔú:l
2f	sáʔti	bətsú:ʔi	tsú:ʔi	ʔálti	bətʔú:li	tʔú:li
2p	sáʔtu	bətsú:ʔu	tsú:ʔu	ʔáltu	bətʔú:lu	tʔú:lu
1s	sáʔət	bsú:ʔ	sú:ʔ	ʔálət	bʔú:l	ʔú:l
1p	sáʔna	mənsú:ʔ	nsú:ʔ	ʔálna	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	zə́:rət	bətzú:r	tzú:r	lə́:mət	bətlú:m	tlú:m
2f	zə́rti	bətzú:ri	tzú:ri	lə́mti	bətlú:mi	tlú:mi
2p	zə́rtu	bətzú:ru	tzú:ru	lə́mtu	bətlú:mu	tlú:mu
1s	zə́rət	bzú:r	zú:r	lə́mət	blú:m	lú:m
1p	zə́rna	mənzú:r	nzú:r	lə́mna	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*

$$\underset{[\text{-long}]}{\overset{\text{V}}{}} \rightarrow [\text{-hi}]$$

This predicts that there should be no short vowels [i], [u] in the language, which is wrong: cf. *bixáːf* 'he fears'. This high vowel derives from a long vowel by unstressed vowel shortening, so this is not a serious counteraxample. 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. sbj	perf.	impf. ind.	impf. sbj
3m	fáːʔ	bifíːʔ	yfíːʔ	ɣáːb	biɣíːb	yɣíːb
3f	fáːʔet	bətfíːʔ	tfíːʔ	ɣáːbet	bətɣíːb	tɣíːb
3p	fáːʔu	bifíːʔu	yfíːʔu	ɣáːbu	biɣíːbu	yɣíːbu
2m	fəʔət	bətfíːʔ	tfíːʔ	ɣəbət	bətɣíːb	tɣíːb
2f	fəʔti	bətfíːʔi	tfíːʔi	ɣəbti	bətɣíːbi	tɣíːbi
2p	fəʔtu	bətfíːʔu	tfíːʔu	ɣəbtu	bətɣíːbu	tɣíːbu
1s	fəʔət	bfíːʔ	fíːʔ	ɣəbət	bɣíːb	ɣíːb
1p	fəʔna	mənfíːʔ	nfíːʔ	ɣəbna	mənɣíːb	nɣíːb
imp	fíːʔ, fíːʔi, fíːʔu			ɣíːb, ɣíːbi, ɣíːbu		

	'remove'			'live'		
	perf.	impf. ind.	impf. sbj	perf.	impf. ind.	impf. sbj
3m	ʔáːm	biʔíːm	yʔíːm	ʕáːš	biʕíːš	yʕíːš
3f	ʔáːmet	bətʔíːm	tʔíːm	ʕáːšet	bətʕíːš	tʕíːš
3p	ʔáːmu	biʔíːmu	yʔíːmu	ʕáːšu	biʕíːšu	yʕíːšu
2m	ʔəmət	bətʔíːm	tʔíːm	ʕəšət	bətʕíːš	tʕíːš
2f	ʔəmti	bətʔíːmi	tʔíːmi	ʕəšti	bətʕíːši	tʕíːši
2p	ʔəmtu	bətʔíːmu	tʔíːmu	ʕəštu	bətʕíːšu	tʕíːšu
1s	ʔəmət	bʔíːm	ʔíːm	ʕəšət	bʕíːš	ʕíːš
1p	ʔəmna	mənʔíːm	nʔíːm	ʕəšna	mənʕíːš	nʕíːš
imp	ʔíːm, ʔíːmi, ʔíːmu			ʕíːš, ʕíːši, ʕíːšu		

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	žarrábət	bətžárreb	tžárreb
2f	sakkárti	bətsákkri	tsákkri	žarrábti	bətžárrbi	tžárrbi
2p	sakkártu	bətsákkru	tsákkru	žarrábtu	bətžárrbu	tžárrbu
1s	sakkárət	bsákker	sákker	žarrábət	bžárreb	žárreb
1p	sakkárna	mənsákker	nsákker	žarrábna	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	byáʔra	yáʔra	báda	byábda	yábda
3f	ʔáret	btáʔra	táʔra	bádet	btábda	tábda
3p	ʔáru	byáʔru	yáʔru	bádu	byábdu	yábdu
2m	ʔaré:t	btáʔra	táʔra	badé:t	btábda	tábda
2f	ʔaré:ti	btáʔri	táʔri	badé:ti	btábdi	tábdi
2p	ʔaré:tu	btáʔru	táʔru	badé:tu	btábdu	tábdu
1s	ʔaré:t	báʔra	ʔáʔra	badé:t	bábda	ʔábda
1p	ʔaré:na	mnáʔra	náʔra	badé:na	mnábda	nábda
imp	ʔra:, ʔri:, ʔru:				bda:, bdi:, bdu:	

	‘disobey’			‘grow’		
	perf.	impf. ind.	impf. sbj	perf.	impf. ind.	impf. sbj
3m	ʕáṣa	byáʕṣa	yáʕṣa	náma	byánma	yánma
3f	ʕáṣet	btáʕṣa	táʕṣa	námet	btánma	tánma
3p	ʕáṣu	byáʕṣu	yáʕṣu	námu	byánmu	yánmu
2m	ʕaṣé:t	btáʕṣa	táʕṣa	namé:t	btánma	tánma
2f	ʕaṣé:ti	btáʕṣi	táʕṣi	namé:ti	btánmi	tánmi
2p	ʕaṣé:tu	btáʕṣu	táʕṣu	namé:tu	btánmu	tánmu
1s	ʕaṣé:t	báʕṣa	ʔáʕṣa	namé:t	bánma	ʔánma
1p	ʕaṣé:na	mnáʕṣa	náʕṣa	namé:na	mnánma	nánma
imp	ʕṣa:, ʕṣi:, ʕṣu:			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 → Ø / __ V

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

(36) a → 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 [byáʔra] derives from /b-yə-ʔra/ by stress assignment, and /b-yə-ʔra-u/ becomes [byáʔru] 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. sbj	perf.	impf. ind.	impf. sbj
3m	bána	byábni	yəbni	dáʕa	byádʕi	yədʕi
3f	bánet	btəbni	təbni	dáʕet	btədʕi	tədʕi
3p	bánu	byábnu	yəbnu	dáʕu	byádʕu	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. sbj	perf.	impf. ind.	impf. sbj
3m	ṭáfa	byáṭfi	yəṭfi	ħáka	byáħki	yəħki
3f	ṭáfet	btəṭfi	təṭfi	ħáket	btəħki	təħki
3p	ṭáfu	byáṭfu	yəṭfu	ħáku	byáħku	yəħku
2m	ṭafé:t	btəṭfi	təṭfi	ħaké:t	btəħki	təħki
2f	ṭafé:ti	btəṭfi	təṭfi	ħaké:ti	btəħki	təħki
2p	ṭafé:tu	btəṭfu	təṭfu	ħaké:tu	btəħku	təħku
1s	ṭafé:t	bəṭfi	ʔəṭfi	ħaké:t	bəħki	ʔəħki
1p	ṭafé:na	mnəṭfi	nəṭfi	ħaké:na	mnəħki	nəħki
imp	ṭfí:, ṭfí:, ṭfú:			ħkí:, ħkí:, ħkú:		

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 [tə́bni] 'she built', and /tə-bni-i/ surfaces as homophonous [tə́bni] 'you f. built' (cf. /tə-ʔra/ → [tə́ʔra] 'she read', /tə-ʔra-i/ → [tə́ʔri] '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	bə́ʔi	byə́bʔa	yə́bʔa	šə́fi	byə́šfa	yə́šfa
3f	bə́ʔyet	btəbʔa	təbʔa	šə́fyet	btəšfa	təšfa
3p	bə́ʔyu	byə́bʔu	yə́bʔu	šə́fyu	byə́šfu	yə́šfu
2m	bʔí:t	btəbʔa	təbʔa	šfi:t	btəšfa	təšfa
2f	bʔí:ti	btəbʔi	təbʔi	šfi:ti	btəšfi	təšfi
2p	bʔí:tu	btəbʔu	təbʔu	šfi:tu	btəšfu	təšfu
1s	bʔí:t	bə́bʔa	ʔə́bʔa	šfi:t	bə́šfa	ʔə́šfa
1p	bʔí:na	mnə́bʔa	nə́bʔa	šfi:na	mnə́šfa	nə́šfa
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 *ʔára*. 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 [bə́ʔyet] 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 [bə́ʔyet] results. In /tə-bni-u/ on the other hand, were Glide Formation to apply, illicit *[tə́bnyu] 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*

$$[+\text{hi}] \rightarrow [\text{-syllabic}] \,/\, \overset{\text{V}}{\text{V C}} \_\_\_ \text{ V}$$

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	wə́ṭi	byú:ṭa	yú:ṭa
3f	wə́ṭyet	btú:ṭa	tú:ṭa
3p	wə́ṭyu	byú:ṭu	yú:ṭu
2m	wṭí:t	btú:ṭa	tú:ṭa
2f	wṭí:ti	btú:ṭi	tú:ṭi
2p	wṭí:tu	btú:ṭa	tú:ṭa
1s	wṭí:t	bú:ṭa	ʔú:ṭa
1p	wṭí:na	mnú:ṭa	nú:ṭa
imp	wṭá:, wṭí:, wṭú:		

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

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	ʔú:fi
1p	wafé:na	mnú:fi	nú:fi
imp	wfí:, wfí:, 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 [yə́wfi], 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	ḍáll	biḍáll	yḍáll
3f	támmet	bəttámm	ttámm	ḍállet	bəṭḍáll	ṭḍáll
3p	támmu	bitámmu	ytámmu	ḍállu	biḍállu	yḍállu
2m	tammé:t	bəttámm	ttámm	ḍallé:t	bəṭḍáll	ṭḍáll
2f	tammé:ti	bəttámmi	ttámmi	ḍallé:ti	bəṭḍálli	ṭḍálli
2p	tammé:tu	bəttámmu	ttámmu	ḍallé:tu	bəṭḍállu	ṭḍállu
1s	tammé:t	btámm	támm	ḍallé:t	bḍáll	ḍáll
1p	tammé:na	məntámm	ntámm	ḍallé:na	mənḍáll	nḍáll
imp	támm, támmi, támmu			ḍáll, ḍálli, ḍállu		

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 *ʔarae: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*

$$\varnothing \rightarrow e: / CVC \left\{ \begin{matrix} C \\ V \end{matrix} \right\} \_\_ + C$$

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.

Syncope	a → Ø / VC __ Ce
Nasalization	b → [+nasal] / __ [+nasal]
Lengthening	V → VV / #C_0 __ C#
Stem augmentation	$\varnothing \rightarrow e: / CVC \left\{ \begin{matrix} C \\ V \end{matrix} \right\} \_\_ + C$
Stress assignment	σ → σ́ / __ ((σ̆)σ̆) #
Pre-cluster shortening	V: → ə / ___ CC

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

Nonlow vowel deletion	$\overset{V}{\begin{bmatrix} -\text{stress} \\ -\text{low} \end{bmatrix}} \rightarrow \varnothing / \_ CV$
Glottal Prothesis	Ø → ʔ / # ___ V
Epenthesis	Ø → ə / C __ CC
Glide Vocalization	ə w C → u: C
Vowel lowering	$\overset{V}{[-\text{long}]} \rightarrow [-\text{hi}]$
Mid vowel reduction	e,o → ə / __ C_0 V
Unstressed shortening	$\overset{V}{[-\text{stress}]} \rightarrow [-\text{long}]$
Glide Formation	$\overset{V}{[+\text{hi}]} \rightarrow [-\text{syllabic}] / V\ C \_\_\_ V$
Vowel cluster simplification	V → Ø / __ V