A Grammar of Ghomara Berber

Mourigh, K.

II Phonology

In the two charts below the consonant phonemes of Ghomara Berber are displayed. The consonant phonemes between brackets are rare and occur mostly in borrowed words. Consonant phonemes (simple and geminate) are grouped together on the basis of their place of articulation.

1. Consonants

Chart 1 Simple Consonants[5]

	Lab	Interd	Alv	Post-Alv	Pal	Vel	Vel-Lbd	Uvu	Uvu Lbd	Phr	Lar
vcl. stop	**p**		**t**			**k**	**k^{w}**	**q**			**(ʔ)**
vcd. stop	**b**		**d**			**g**	**g^{w}**				
vcl. pha. stop			**ṭ**								
pha vcd. stop			**ḍ**								
vcl. fric.	**f**	**t̲**	**s**	**š**		**k̲**	**k̲^{w}**	**x**	**x^{w}**	**ḥ**	
vcl. phr. fric.			**ṣ**								
vcd. fric.	**b̲**	**d̲**	**z**	**ž**		**ḡ**	**ḡ^{w}**	**ɣ**	**ɣ^{w}**	**ɛ**	
vcd. phr. fric.		**d̲**	**ẓ**								
vcl. affr.				**č**							
vcd. affr.				**ǧ**							
approx.					**y**		**w**				**h**
tap			**r**								
pha. tap			**ṛ**								
lat. approx.			**l**								
pha.lat.approx.			**(ḷ)**								
nasal	**m**		**n**								

[5] lab = labial, interd = interdental, alv = alveolar, post-pal = post-alveolar, pal = palatal, vel = velar, lbd = labialised, uvu = uvular, phr = pharyngeal, pha = pharyngealised, lar = laryngeal, vcd. = voiced, vcl. = voiceless, lat = lateral, approx. = approximant

Chart 2 Geminate Consonants

	Lab	Interd	Alv	Post-Alv	Pal	Vel	Vel-Lbd	Uvu	Uvu Lbd	Phr	Lar
vcl. stop	(**pp**)		**tt**			**kk**	**kk^{w}**	**qq**	**qq^{w}**		
vcd. stop	**bb**		**dd**			**gg**	**gg^{w}**				
phr. vcl. stop			**ṭṭ**								
phr. vcd. stop			**ḍḍ**								
vcl. fric.	**ff**		**ss**	**šš**		**xx**				**ḥḥ**	
vcl. phr. fric.			**ṣṣ**								
vcd. fric.			**zz**	(**žž**)		(**ḡḡ**)				**εε**	
phr. vcd. fric.		(**ḍ̲ḍ̲**)	**ẓẓ**								
approx.					**yy**		**ww**				**hh**
trill			**rr**								
phr. trill			**ṛṛ**								
lateral			**ll**								
phr. lateral			(**l̤l̤**)								
nasal	**mm**		**nn**								

Like many other Berber languages the Ghomara consonant system has the typical contrastive features of voice, pharyngealisation and length (Kossmann 2012: 6, see Galand 2010: 49-59 who regards length as the result of tension). Most voiced consonants have a voiceless counterpart. All consonants distinguish length (in a few cases combined with another feature), which is used in morphophonological oppositions, especially in verbs. Pharyngealisation occurs with alveolar consonants. Velar and uvular consonants oppose labialised versus non-labialised phonemes.

The relationship between (short) plosives and fricatives deserves special attention. In word-medial position, the plain continuants **b̲**, **t̲**, **d̲**, **ḍ̲**, **k̲**, **k̲^{w}**, **ḡ** and **ḡ^{w}**, are in phonemic opposition to their plosive equivalents. The plain continuants are the result of a process of spirantisation of stops which is a general development in the Northern Berber varieties (cf. Kossmann, 2012: 11-12). In word-initial and word-final position the phonemic contrast is neutralised to a large extent. In word-initial position there are only stops. In word-final position, stops occur in post-consonantal position while fricatives occur in post-vocalic position[6]. In intervocalic position the fricatives are more frequent. These are generalisations for which counter-examples exist. The geminate counterparts are always realised as plosives (except for marginal **ḡḡ** which is only attested in the verb with the same form **ḡḡ** 'to do/ to make').

[6] In neighbouring Chefchaouen Arabic, spirantisation of stops occurs only in postvocalic position (cf. Moscoso 2002: 37-49).

Apart from the spirantised - occlusive pairs, there are two other simple - geminate consonant pairs which are irregular. The Aorist and the Imperfective forms are contrasted:

	Aorist	**Imperfective**		
w > *gg*^{w}	*zwir*	*zuggir*	*/zegg*^{w}*ir/*	‘precede’
ɣ > *qq*	*ɣems*	*qqems* (~ *ɣems*)		‘cover’

Below we will discuss each consonant separately. The major topics are: the status of the spirantised consontants, the status of the **ǧ** and **č** and the semi-vowels. In separate paragraphs a summary of the distribution of spirantised consonants will be given. This will be followed by a brief discussion of the status of the geminates and the spread of pharyngealisation. In the section on the vowels, the diphthongs are presented and the behaviour of schwa is discussed. Separate paragraphs are dedicated to assimilations, elision of final consonants, vocalic sandhi and finally labialisation.

1.1. Labial and labiodental consonants

p [IPA: p]

This consonant is often found in loanwords from European languages, mostly from Spanish. In a few cases non-European words contain a **p** as well, such a *iparparen* ‘money’ *lpeɣṛiṛ* ‘pan cake’, *ṭṭawpa* ‘rat’.

pp [IPA: p:]

This consonant is only found in medial position.
čappu ‘cap’

Distribution of b [IPA: b] ~ b̲ [IPA: β]

In initial position **b** is prevalent over **b̲**. Very few instances of initial **b̲** exist, while examples of initial **b** are many.

beṛṛa	‘outside’
baqi	‘still’
bezzaf	‘many’
beḵri	‘early’
berreḥ	‘call!’
bellarež	‘stork’
baɛṭiyaṯna	‘between us’
bežžṭen	‘they trampled’
berrḏax	‘I made cold’

baḇa	‘father’

The few exceptions with initial **ḇ** are given below. These examples show that there is, marginally, a phonemic opposition in this position.

ḇeddax	‘I stood up’
ḇeẓḏax ~ beẓḏax	‘I urinated’

As for word-internal position, **ḇ** never occurs after **l**. Furthermore, there is a tendency for the **b** rather than **ḇ** to occur after **t**, although there are a few exceptions. Examples of words in which these sequences occur are:

lbaṭil	‘boat’
lbir	‘well’
lbiṯ	‘room’
lbuṛka	‘pond’
lbettix	‘melon’
lbibiru	‘feeding bottle’
itbaɛbaɛ	‘it bleats’
itbeḷbaḷ	‘he cuddles’
tbuweh	‘it mooed’

There are a number of exceptions to these two generalisations, for example:

llḇayṭ	‘great-grandchildren’
llḇač	‘sail, wind from the north’
itḇerraḏ	‘he makes cold’
ketḇax	‘I wrote’
tḇaɛ	‘follow’

In most word-medial consonant clusters, the appearance of **b** or **ḇ** is unpredictable as shown in the examples below.

first member of a consonant cluster:

ddebliž	‘bracelet’	vs.
lǧeḇli	‘Jebli man’	

ssḇibṭaṯ	‘little shoes’	vs.
teḇṭut	‘you divided’	

ṭṭebṣil	‘plate’	vs.
taḇṣelt	‘onion’	

second member of a consonant cluster:

ssbiɣa	‘paint’	vs.
ssḇeɛ	‘lion’	

teqbex	‘I pierced’	vs.
taqḇilt	‘village’	

Intervocalically, **ḇ** occurs more often and in fact intervocalic **b** is very rare. For example:

intervocalic ḇ

iɛraḇen	‘village of Iraben’
taḇekkiwt	‘worm’
taḇeṛquqt	‘prune’
taḇeṛṛiḵt	‘sheep’
tektaḇax	‘I am writing’

intervocalic b

itgabal	‘he keeps an eye on’
tibaṭaṭan	‘potatoes’

Word-finally **ḇ** is found after a vowel. **b** is found after a consonant although the evidence for this is restricted to one example.

qelleḇ	‘to try’
iheṛreḇ	‘he made flee’
itseyyaḇ	‘he throws’
ixṭeḇ	‘he asks to marry’
aḏerraḇ	‘stone’
lğumb	‘side’

bb [IPA: bː]

bbax ‘I took’; *lḥebb* ‘wheat’

f [IPA: f]
fawen ‘they are in the morning’; *afus* ‘hand’; *tawnaft* ‘bread’

ff [IPA: f:]
ffuɣ /ffeɣ^{w}/ ‘get out’; *ayeffeṭ* ‘cattle’; *afaff* ‘nipple’

m [IPA: m]
mṭel ‘bury’; *aman* ‘water’; *aḡelzim* ‘pickaxe’

mm [IPA: m:]
mmuṯ ‘die!’; *ikemmeṭ* ‘he burns’; *ssemm* ‘poison’

1.2. Interdental and alveolar consonants

Distribution of t [IPA: t] and ṯ [IPA: θ]
Word-initially only the plosive pronunciation **t** occurs. In word-medial position both **ṯ** and **t** occur in the same environments. Therefore we assume a phonemic distinction between the two consonants in word-medial position. In word-final position the realisation is **ṯ** after a vowel and **t** after a consonant, although there are a few exceptions which have **t** after a vowel. Examples for each of the positions are:

initial t

taɛeddist	‘belly’
taɛeyyalt	‘girl’
tameṭṭuṯ	‘woman’
tammart	‘beard’
tawfalt	‘egg’

medial t

ikteḇ	‘he wrote’
isten	‘it barks’
fteḥ	‘open!’
atay	‘tea’
ameḵter	‘long wooden stick of the plough’
kafatira	‘kettle’

medial ṯ

The medial **t̲** occurs intervocalically as well as adjacent to a consonant, for example:

aṯebban	‘trousers’
tlaṯa	‘three’
ttiṯun	‘they go’
ayeṯma	‘brothers’
lexwaṯem	‘rings’
sekṯax	‘I hushed’
meṯqeḇ	‘chisel’
lemṯaɛ	‘property’
tamṯunt	‘yeast’
ɛemmṯiwaṯ	‘aunts’
tafṯilt	‘fuse’

final t

taqḇilt	‘tribe’
tiḏert	‘ear (of wheat)’
taferkiwt	‘small piece of land’
tawnaft	‘baked bread’
taṣefṛawt	‘yellow’
tafirast	‘pear’
taɣezdist	‘rib’

final t̲

lbiṯ	‘room’
lḥanuṯ	‘shop’
taslaṯ	‘bride’
tameṭṭuṯ	‘women’
taḡayzuṯ	‘calve’
muqqṛeṯ	‘big (F./PL)
taneḇduṯ	‘mowing season’
itmettaṯ	‘he dies/is dying’

Post-vocalic final t

In a few cases **t** appears word-finally and postvocalically (cf. III.1.3.2.)[7].

tarḇat	‘girl’
tafriwet	‘wing’

[7] Final -**t** following a vowel could have developped from geminate final -**tt** (cf. Penchoen, 1973: 13-14).

taḡīḡet	‘tree’
taqahat	‘crow’
tilket	‘louse’
taḥebbit	‘grain’
taḏuṭṭ	‘wool’

In the following two Arabic-morphology nouns, which form the plural by inserting a vowel before the final consonant, **t** changes to **ṯ** in final position:

SG	PL	
lqent	*leqnuṯ*	‘corner’
ššent	*lešnaṯ*	‘yoke for donkeys’

t > h ~ Ø

In some positions **t** becomes **h** or disappears completely.[8] This only happens in subject prefixes on the verb, in third person direct object pronouns (masculine and feminine) and in the numeral ‘one’. The subject prefix **t-** on the verb regularly changes to **h ~ Ø** when followed by a **t** or **tt** (whether it is a Imperfective prefix or a verb stem consonant), for example:

Before the Imperfective marker **tt- ~ t-**.

hetteftaf ~ tteftaf (< *tetteftaf*)	‘she is searching’
hteqqlet ~ teqqlet (<*tteqqlet*)	‘you return’
hettara ~ ttara (< *tettara*)	‘she writes’

Before a **tt- ~ t-** which is part of the verb stem.

hettru ~ ttru (<*tettru)*	‘she keeps on crying’

There is free variation between **t** and **h** in the subject prefixes of the Perfective. The subject prefixes are never reduced to zero. In similar context the prefix can be either **t** or **h**, for example:

saɛa tedda	‘and then she went’
amḵ a hedda (< tedda)	‘when she went’
heqqim	‘she sat’

[8] Lafkioui (2009: 109) notes for Senhaja de Srair: ‘*L’elément ṯ(e)- est en variation libre avec les formes spirantisées h(e)- et Ø- ches les Ayt Ktama, les Ayt Taghzut et les Ayt Bucibet (Rif occidental). La marque Ø- est aussi régulièrement attestée dans plusieurs variétés centrales.*’

All subject prefixes with **t** in the Aorist disappear after a non-real marker (cf. IV.8.1.1.3.), e.g.

š a ddu (< š a teddu)	'she will go.'
š a ddut (< š a teddut)	'you will go.'

The direct object pronoun **at̲** has a variant **ah** when preceding deictic clitic **d / id** (cf. III.11.2.1.).

tt [IPA: t:]
tthawed̲ 'talk (to each other)!'; *netta* 'he'; *afatt* 'branch'

ṭ [IPA: tˤ]
aṭil 'grapes'; *aṭg̲am* 'yesterday'; *ikemmeṭ* 'to burn'

There is a tendency in some speakers' speech for **ṭ** to become **d̲**, after a vowel or a voiced consonant, for instance:

ayeffeṭ > ayeffed̲	'cattle'
lmuṭaɛ > lmud̲aɛ	'to a place'
baɛṭem > baɛd̲em	'to each other'
mriṭ > mrid̲	'ill'

ṭṭ [IPA: tˤ:]
ṭṭmaṛ 'date'; *ineṭṭar* 'he flies'; *ṭṭeṭṭ* 'suck'

Distribution of d [IPA: d] and d̲ [IPA: ð]

Initial position
Initial **d** and **d̲** are not very frequent in Ghomara Berber. The few words that begin with either of these consonants have the stop, except for one verb.

initial d

daxel	'inside'
deɣdak̲	'earlier'
daʔimen	'always'
dhad̲inet̲	'here'
das	'there'

dar	‘to’
deggax	‘I do’
dleḡ	‘rub!’
dafeɛ	‘defend!’
derreɛ	‘embrace!’

initial ḏ

ḏrix	‘I passed’

Medial position

Medial **d** appears in consonant clusters as well as intervocalically. After **r** and **n** mostly **d** is found, although after **r** there are a few exceptions where **d** and **ḏ** are in free variation. Intervocalic **d** is rare, one normally finds **ḏ**. All instances of intervocalic **d** are listed below. Medial **d** adjacent to a consonant and intervocalic **d** are also presented. Sometimes there is free variation in intervocalic position. In final post-consonantal position **d** appears, whereas fricative **ḏ** appears in postvocalic position. However, there are a few exceptions.

medial d adjacent to a consonant

deɣdaḵ	‘earlier’
meɛdum	‘ill’
lferdi	‘gun’
lkebda	‘liver’
isardunen	‘mules’
issendaw	‘he churns’
ɛdel	‘make!’
itdeḡdaḡ	‘he crushes’
zdu	‘under’
ageždir	‘green lizard’

intervocalic d

lbidu	‘bucket’
abdidu	‘small bucket’
lebradeɛ	‘saddles’
tamezgida (~ tamezgiḏa)	‘mosque’
adideḡ	‘mortar’

medial ḏ adjacent to a consonant

aḡḏi	‘jackal’

tamḏa	‘pond’
qḏim	‘old’
aḏfel	‘snow’
aḏɣes	‘colostrum’
lqaɛḏa	‘part of the plough’
tafḏent	‘toe’
ttaẓḏax	‘I pee’

Intervocalic ḏ

thaḏin	‘this one (F.)’
taxaḏemt	‘ring’
mnaḏem	‘man/person’
taḏunt	‘fat’
aḏem	‘blood’
iḏes	‘with hem/her’
tamuḏa	‘sow’

final d

issend	‘he churned’
aɣižd	‘billy goat’
aṭuḡd	‘finger’
ṣṣehd	‘heat’
lǧeld	‘skin’
lqird	‘monkey’

final ḏ

lberraḏ	‘tea pot’
uhaḏ	‘this one (msc.)’
iḥseḏ	‘he envied’
ɛiḏ	‘still’
seqqeḏ	‘release (goats)’
iheddeḏ	‘he threatens’
aɣeḏ	‘ash’
elqruḏ	‘monkeys’
leǧluḏ	‘skins’
ažebbaḏ	‘elastic’
afuḏ	‘knee’

There are a few exceptions, which have **d** postvocalically.

lwalid	‘father’
zzrud (~ *zzruḏ*)	‘feast meals’
l?aždad	‘ancestors’

dd [IPA: d:]
dder ‘be alive’; *medden* ‘people’; *lḥedd* ‘border, sunday’

The **dd** in the verb **ddu** ‘to come’ can become a single **d** between vowels and after the deictic clitic **d** ‘hither’.

a d idu	‘he will come’

ḏ [IPA: ðˤ]
The consonant **ḏ** is very rare. In certain cases it is a free variant of **ṭ**. In words such as *ayeṛḏay* ‘mouse’ and *iẓẓaḏ* ‘he grinds’ (I) it could be a result of the spread of pharyngealisation. An example is:
taḏuṭṭ ‘wool’

In some words **ḏ** and **ḍ** are in free variation, for example:
ḥḏi ~ *ḥḍi* ‘keep an eye on’
ṛṛemḏan - *ṛṛemḍan* ‘ramadan’

ḏḏ [IPA: ðːˤ]
ḏḏ is very rare. Apart from **ḥeḏḏi** ~ **ḥeḍḍi** ‘he keeps an eye on’ which are in free variation, only the following noun and verb in our corpus have this geminate consonant.
tiḏḏa ‘leech’; *meḏḏi* ‘to sharpen’

ḍ [IPA: dˤ]
This phoneme is not found in word-final position.
ḍess ‘laugh’; *lweṛḍa* ‘a rose’

ḍḍ [IPA: dːˤ]
This phoneme is restricted to three instances in our corpus:
ḍḍḇaɛ ‘jackal’; *feḍḍi* ‘finish!’; *lɣeḍḍaṛ* ‘traitor’

n [IPA: n]
anas ‘sparkle’; *afenṭuṭ* ‘lip’; *iḥessen* ‘he shaved’

nn [IPA: nː]
nnan ‘they said’; *genna* ‘sky’; *inn* ‘he said’

s [IPA: s]
asif ‘river’; *tasa* ‘cow’; *iles* ‘tongue’

ss [IPA: sː]
assa ‘nowadays’; *iḥesseḇ* ‘he counts’; *iɛiss* ‘to guard’

ṣ [IPA: sˤ]
ṣum ‘fast!’; *ṣuṣef* ‘spit!’; *ixelleṣ* ‘he payed’

ṣṣ [IPA: sːˤ]
ṣṣebbaṭ ‘shoes’; *aneṣṣaḇ* ‘piece of iron on which bait is put’; *lgeṣṣ* ‘big floor’

z [IPA: z]
zebbel ‘curse!’; *azar* ‘fur’; *ḵrez* ‘plough!’

zz [IPA: zː]
zzuɣur ‘pull!’; *rezzwan* ‘they delouse’; *ihezz* ‘he shook’

ẓ [IPA: zˤ]
ẓum ‘fast!’; *aẓaṛ* ‘root’; *illuẓ* ‘he is hungry’

ẓẓ [IPA: zːˤ]
ifeẓẓeṛ ‘he cut open’; *iẓẓaṛ* ‘he sees’; *afaẓẓ* ‘edible part of doum leaf’

1.3. Post-alveolar consonants

š [IPA: ʃ]
ašqef ‘snail shell’; *taxšeḇt* ‘trap’; *iɛaš* ‘he lived’

šš [IPA: ʃː]
ššɛaṛ ‘hair’; *šš* ‘eat!’; *iṛešš* ‘he splashed’

č [IPA: tʃ]
This consonant is quite rare. Most often it appears in Spanish loanwords and in onomatopoeia. We consider it a phoneme on its own, as there is one verb which shows its use in a morphophonological opposition, namely the Imperfective formation. Many verbs form the Imperfective by geminating the second consonant of the Perfective (cf. paragraph 7.6.1.2. for this type of Imperfective formation). Compare the Perfective and the Imperfective forms of the verb **ḵšem** 'to enter'.

P	**I**	
iḵšem	'he entered'	*ikečem* 'he always enters'

There is no phonetic difference between the **č** in the verb above and **č** in the following nouns.

čeppuxa 'balloon' *aḥečun* 'vagina', *llḇač* 'hot rain, sail'

The phonetically same sound **tš** can be the result of a sequence of **t** + **š**, for example in the derived form **tšaq** 'be split' or in **ḥetšax** 'I have fetched the grass' which is the first person singular form of **ḥteš** 'to fetch grass'. In this case **tš** is written instead of **č**.

The Arabic article does not assimilate to the **č** of Arabic-morphology nouns, for example:

lčaḇula	'shed'
lčuppa	'lollipop'
lčimineyya	'chimney'
lčeṛqun	'filth on the skin'

ž [IPA: ʒ]
ižni 'he picked'; *lḥaža* 'thing'; *afeṛṛuž* 'rooster'

The phoneme **ž** changes to **ǧ** when following **l**, **n** or **r**. With one exception in our corpus, **ž** is always realised as **ǧ** following the Arabic article **l**. The article does not assimilate to the consonant[9]. Examples of **ǧ** are:

lǧeɛda	'carrot'
lǧeld	'skin'
lǧmel	'camel'

[9] In many varities of Moroccan Arabic the article assimilates to the **žž** (cf. Heath 2002: 169).

lğawf	‘breast’
lbelğ	‘lock’
nğeṛ	‘make furniture’
lxurğa	‘exit’

There are a few exceptions, especially after **r** and very rarely after **l** and **n**[10].

lžaw	‘weather’
nnžem	‘star’
tageržumt	‘Adam’s apple’
lxurža (~ lxurğa)	‘exit’
lmeṛža	‘swamp’

We also find a few instances of **ğ** following **ḥ** and **w**[11].

ameḥğuṛ (PL: *lmḥažeṛ*)	‘orphan’
zzawğa (~ *zzawža*)	‘a pair of animals’

The following singular - plural pairs show that **ğ** alternates with **ž** in forms where there is no direct contact with the triggering consonant.

SG		PL	
lğumb	‘side’	*ležnaḇ*	‘sides’
lğlaleḇ	‘djellabas’	*ažellaḇ*	‘djellaba’
lğim	‘pocket’	*ležyam*	‘pockets’
amenğuṛ	‘chair’	*lemnažeṛ*	‘chairs’
lğduḏ	‘ancestors’	*žeddi*	‘my grandfather’

An unexplained occurrence of **ğ** is found in the verb **ğeṛğeṛ** ‘glide/drag along the ground’ which corresponds to **žeṛžeṛ** ‘glide/drag along the ground’ in Moroccan Arabic (Harrell, 1966:236). The initial **ğ** could be a geminate counterpart of **ž**. The second second **ğ** follows an **r**. Another case is the collective noun **lğuğeṯ** ‘walnut’ in which the second affricate corresponds to **ž** as shown by the unity noun **tažužet** ‘a walnut’. In the case of the active participle forms **maži** / **mağa** (~ **mažža**) / **mağin** (~**mažžin***)* ‘come’ the **ğ** can be explained as a realisation of underlying **žy**.

[10] Compare Anjra Arabic (Vicente 2000:45) for a similar situation.

[11] In Chefchaouen Arabic **ğ** also occurs when following **n**, **d**, **ḥ**, **ɣ**, **ɛ**, **š**, **f** (Moscoso, 2002:43).

There is free variation between **ž** and **ǧ** in a limited number of instances, for example:

tɛežb as ~ *tɛeǧb as* 'he liked her'

ǧ [IPA: dʒ]
iǧun 'he has eaten enough'; *weǧeḏ* 'prepare'; *iǧ* 'he left'

Some instances of **ǧ** correspond to **žž**. In the first place, the verb **ǧ** 'to let/leave' has optional deaffrication. Deaffrication only takes place at the end of an utterance or before a consonant, for example:

š	*a*	*y*=*ne-žž*	*dar*	*ṣṣḇeḥ*
FUT	AD	3MS:DO=3MS-leave:A	until	morning

'We will leave him until the morning.'

Compare also the following example of the second singular Perfective form and the third person masculine singular form which is in final position and is deaffricated.

2S	**3MS**	
teǧat 'you left'	*ižž*	'he left'

Furthermore, deaffrication is found as a variant of the second person masculine independent pronoun when it is the final consonant (see III.11.1).

keǧi(n)	'you'	*kežž*	'you'

In Arabic loans, Ghomara **ǧ** often corresponds to **žž** in other variants of Moroccan Arabic, e.g.

Ghomara	Mar. Arab.		
leqmiǧa	*leqmižža*	(Harrell, 1966:109)	'shirt'
lḥaǧ	*lḥažž*	(Harrell, 1966:251)	'pilgrim'
tuǧaṛ	*tužžaṛ*	(Harrell, 1966:163)	'merchant, wealthy man'

In the following verb pairs **ž** and **ǧ** are opposed. In the first example the second verb is derived from the first verb by gemination of the second consonant (Arabic stem II). The

second and third example show the difference between Perfective and Imperfective verb pairs. In the Imperfective the first consonant is geminated yielding the affricate **ǧ**[12].

P		**I**	
wžeḏ	'it is prepared'	*iweǧeḏ*	'he prepares'
ižreḥ	'he is injured'	*iǧruḥ*	'he is always injured'
ižmeɛ	'he gathered'	*iǧmuɛ*	'he gathers'

The consonant **tž** in for example the **t**- derived form **tžewwi** 'be wrapped up' is phonetically the same as **ǧ** but is not considered the same consonant.

There is no length difference between the allophone **ǧ** of **ž** and the phoneme **ǧ** which corresponds to **žž** in other variants of Moroccan Arabic[13]. Therefore there are two phonemes: **ž** and **ǧ**.

We found only one invariable instance of **žž** in our corpus (IPA: ʒː] which is not the result of deaffrication of **ǧ**, namely **ḇežžeṭ** 'to trample on'.

1.4. Lateral and rhotic consonants

r [IPA: r]
argaz 'man'; *yura* 'he wrote'; *kkur* 'stand up'

rr [IPA: rː]
rri 'bring back'; *berrḏax* 'I froze'; *taḇerriwt* 'animal dropping'

ṛ [IPA: rˤ]
ṛebbi 'raise!'; *lešfaṛ* (*n ṭiwan*) 'eyelids'; *ameṛ* 'send'

ṛṛ [IPA: rːˤ]
ṛṛmel 'sand'; *seṛṛḏen* 'they sent'; *aḇeṛṛey* 'ram'

[12] This is not the result of an assimilation of imperfective **tt** ~ **t** with **ž**. This is a regular morphological Imperfective formation which geminates the first consonant and inserts and **u** before the final consonant.
[13] El Hannouche's data show that there are more exceptions in Amṭiqan with regards to the **ž**. In his texts (2010:177-242) we find for example **lželd**, **lžemɛa**, **lžiran**, but also **(e)lǧri**. Furthermore, we find **amenžur** (273) and **nžum** (65). The phoneme **ǧ** is never realised as **žž** as in **aheǧal** (65), **keǧ** (113) and **aǧaṛ** (235).

l [IPA: l]
iles ‘tongue’; *alum* ‘hay’; *ikemmel* ‘he finished’

In a few cases there is free variation between **l** and **r**, for example:

tilkan ~ *tirkan*	‘head louse’
tilḵaman ~ *tirḵaman*	‘kind of spinach’
pulpu ~ *purpu*	‘octopus’ (< Spanish)

ll [IPA: l:]
lluẓ ‘be hungry!’; *mellḵen* ‘they marry’; *ggull* ‘swear’

The pharyngealised lateral **ḷ [IPA: lˤ]** does not occur on its own in non-pharyngealised contexts. The geminate **ḷḷ [IPA: l:ˤ]** is only found in words containing **aḷḷa** ‘God’ such as **staɣfiṛuḷḷa** ‘may God forgive’, **weḷḷa** ‘I swear’ and **yaḷḷa** ‘come on’.

1.5. Velar consonants

Distribution of k [IPA: k] and ḵ [IPA: x]
The consonants **k** and **ḵ** have the same place of articulation, in the front-velar/mid-velar range; **ḵ** is thus quite different from the palatal fricative [**ç**] found, for instance, in Tarifiyt and in Kabyle Berber. The consonant **k** is found more often than **ḵ** in initial position. The examples enumerated below are all the words beginning with **ḵ** in our corpus.

initial k

kelwa	‘kidney’
kelma	‘word’
kuɛballa	‘female jackal’
kursi	‘chair’
kamlin	‘all (PL)’
kreh	‘hate!’
keği	‘you (M:SG)’
kerkeḇ	‘roll!’

initial ḵ

ḵma	‘my brother’
ḵra	‘some’
ḵrez	‘plough!’

k̲errek̲	‘lie!’

In word-medial environments, both **k** and **k̲** can occur, both intervocalically and in pre- and postconsonantal position, for example:

medial k

tilket	‘louse’
ilkem	‘he entered’
tiskert	‘garlic’
škun	‘who’
tirkila	‘bitches’
muškil	‘problem’
akeṛkuṛ	‘stone heap’
saket̲	‘quiet’
akeḥlaw	‘black (person)’

medial k̲

melk̲en	‘they married’
tilk̲aman	‘type of spinach’
ssk̲emṭ-awet̲	‘burn!’ (PL)
ak̲enniw	‘twins’
tafuk̲t	‘sun’
lmak̲la	‘food’
ak̲al	‘soil’
bek̲ri	‘early’
ak̲mez	‘nail’
ak̲emmar	‘face’
imuk̲ar	‘thieves’

In word-final position, **k̲** occurs after a vowel (including schwa) and **k** after a consonant. A singular - plural pair like **lmilk** ‘possession’ **amlak̲** ‘posessions’ shows this alternation.

final k

ṭṭaḥk	‘laughter’
ifk	‘he gave’
iwešk	‘he got lost’
aṭužk	‘male partridge’
sselk	‘iron wire’

There are a few exceptions in our corpus with final postvocalic **k**:

lplaṣṭik	‘plastic’
hak	‘here!’

final k̲

deɣdak̲	‘earlier’
lmalik̲	‘king’
nnek̲	‘yours’
itk̲erak̲	‘he lies’
haḏik̲	‘that’
ašrik̲	‘farmer’s assistant’
aḇeddik̲	‘rooster’

kʷ [IPA: kʷ]
Labialised **kʷ** is only found in the Aorist form of the verb /lkʷem / [lkum] ‘arrive, reach’ and the derived form /sselkʷem/ [sselkum] ‘make arrive, reach’ (see IV.3.2.1.1. on the causative prefix).

k̲ʷ [xʷ]
Labialised **k̲ʷ** is found, among others, in **tak̲ʷmamt** ‘muzzle’ and the Aorist of the verb **ak̲ur** (/ak̲ʷer/) ‘steal’.

kk [IPA: k:]
Geminate **kk** stands in morphophonological opposition to **k** in **ilkem** ‘he arrived’ - **ilekkem** ‘he arrives’ as well as to **k̲**, e.g. in **ik̲nes** ‘he argued’ - **ikknes** ‘he argues’.
ikkrez ‘he ploughs’; *ilekkem* ‘he arrives’; *ḥekk* ‘scratch’

kkʷ [IPA: k:ʷ]
Labialised **kkʷ** is only found in the Aorist forms of the verbs **kkur** /kkʷer/ ‘get up!’; **ukkr-awet̲** /kkʷer-awet̲/ ‘get up!’ (PL) and **kkus** /kkʷes/ ‘remove!’ - **ukks-awet̲** /kkʷs-awet̲/ ‘remove!’ (PL).

Distribution of g [IPA: g] and ḡ [IPA: ɣ]
Like **k** and **k̲**, the consonants **g** and **ḡ** have front-velar to mid-velar pronunciation. The consonant **ḡ** therefore has a different pronunciation from **ḡ** in other Berber languages, such

as Kabyle and some Tarifiyt varieties, which is a voiced palatal fricative **[ʝ]** . Word-initially only **g** is attested, as in the following examples.

initial g

genna	‘sky’
gum	‘in front of’
gas	‘in it’
gatri	‘bed’
geṛṛu	‘cigarette’
gales	‘seated’
gewwez	‘pass!’
gewweḏ	‘lead!’

In medial position both **g** and **ḡ** are attested adjacent to both vowels and consonants. When following alveolar consonants **l**, **r**, **t**, **n**, **z** the stop **g** is more frequent than fricative **ḡ**. In some words, there exists free variation between **g** and **ḡ**, notably when following **ṭ** and **ẓ**, e.g. **aṭgam** ~ **aṭḡam** ‘yesterday’ and **taẓga** ~ **taẓḡa** ‘forest’.

medial g

targa	‘canal’
angi	‘rain water’
lgebṣ	‘gypsum’
azgazneṭ (~ *azg^{w}azneṭ*)	‘two years ago’
imezgan	‘ears’
tageržumt	‘adam’s apple’
agamgam	‘big rock’
lemnagež	‘earrings’
ngi	‘push!’
ageyyaṛ	‘tree stump’

medial ḡ

aḡḏi	‘jackal’
aḡṭiṭ	‘bird’
taḡiḡet	‘tree’
aḡellu (*awellu*)	‘plough’
taḡursa	‘ploughshare’
aṭuḡd	‘finger’
taḡnawt	‘pumpkin’

asegnu	‘clouds’

The noun **agellu** ‘plough’ has a free variant **awellu**. It is reported by informants that in Beni Mensour the noun **tagiget** ‘tree’ is pronounced **tawiget**.

In final position **g** and **ḡ** are not very frequent. There is a preference for **ḡ** in final postvocalic position, while after a consonant there is always **g**.

final g

lbergag	‘traitor’
izegzeg	‘it mated’
čerrag	‘tear apart!’
sennig	‘above’
werg	‘dream’
lferg	‘swarm of birds’

final ḡ

ideḡdeḡ	‘he crushed’
nṭeḡ	‘fly!’
amezzuḡ	‘ear’
iḇzeḡ	‘he moisted’
iẓẓeḡ	‘he milked!’
adideḡ	‘mortar’
afraḡ	‘fence’
azzuḡ	‘wetness’

g^{w} [IPA: g^{w}]

This consonant is among others found in the diminutive noun **tag^{w}sisert** ‘small downwards slope’ and in **ag^{w}laf** ‘bee swarm’.

ḡ^{w} [IPA: ɣ^{w}]

This consonant is found in the Aorist verb form **neẓẓuḡ** (/neẓẓeḡ^{w}/) ‘we milked’ and in the Aorist form **nsaḡum** (/nsaḡ^{w}em/) ‘we will wait’.

gg [IPA: g:]

In verbs there is a morphophonological opposition between **g** - **gg** as in **ingi** ‘he pushed’ and **ineggi** ‘he pushes’. cf. also **iggez** ‘he descended’.

gg^{w} [IPA: g:^{w}]
This shows up in **inugg** (/inegg^{w}/) ‘it is cooking’ where it is the geminate of **w**, and also in the Aorist form **gguz** (/gg^{w}ez /) ‘descend!’.

ḡḡ [IPA: ɣɣ]
There is one instance of geminate **ḡḡ** in Ghomara. The **ḡḡ** in this word can become **ww**, *teḡḡet* > *tewwet* ‘you did’. This consonant does not have a labialised counterpart.
ḡḡ ‘do, make’

Lenition
In some verbs and nouns the consonant **gg^{w}** and **gg** are in free variation with **ḡ** and **ḵ** intervocalically. For example:

aggez ~ *uggez* ‘recognise!’	> *š a y nuḡuz / š a y nuḵez*	‘we will recognise him.’
gguz /gg^{w}ez/ ‘go down!’	> *ss-ugez / ss-uḵez*	‘make go down!’
tiggura ~ *tiḡura*		‘doors’

1.6. Semi-vowels

y [IPA: j]
ayaw ‘grandchild’; *taryalt* ‘basket’; *amaẓay* ‘canine tooth’

In sequences of two high vowels **i** and **u** in initial position the result is free variation between **yu** and **iw** for example:

yuḡel ~ *iwḡel*	‘he hung’
yuḵi (*yuḵa*) ~ *iwḵa*	‘he crossed (the water)’

yy [IPA: j:]
The semi-vowel **yy** is only found in word-medial position.
seyyeḇ ‘throw!’ ; *keyyel* ‘weigh!’

w [IPA: w]
weṛṛeḵ ‘lie down!’; *ittawi* ‘he brings’; *aḡnaw* ‘big pumpkin’

The geminate correspondent of **w** can be **gg^{w}**, for example in **rwel** (P) - **ruggel** (I) /regg^{w}el/ ‘to flee’. However, there are other verbs which have **ww** as the geminate correspondant, for example the verb **xwi** (P) **- xewwi** (I) ‘to empty’.

ww [IPA: w:]
The semi-vowel **ww** is only found in medial position.
xewwef ‘frighten’; *aṭewwiš* ‘rain-pipe’

Behaviour of semi-vowels
When in contact with schwa, the semivowel **w** can in some positions be realised as /u/, compare for example the following forms of the same verb:

nuɣel ~ *newɣel*	‘we are trapped.’
ittewsir ~ *ittusir*	‘he is becoming old’
lewqiṯ ~ *luqiṯ*	‘matches’
š a sut / š a swet	‘you will drink’
ttun ~ *ttwen*	‘they forgot’

In final position **ew** and **u** are neutralised, and are both realised as **u**. For example:

š a nu (< *š a ssnew*)	‘it will be cooked’
š a ttu (< *š a ttew*)	‘he/she will forget’
š a su (< *š a sew*)	‘he/she will drink’

Similarly, the difference between **i** and **ey** is neutralised in favour of **i** in final position., e.g.
ittawi ‘he takes’

There is free variation between the form between **ey** and **i** when followed by a suffix, e.g.
ttawyen ~ *ttawin* ‘they take’

Not all final **i**’s are the result of the neutralisation of **ey**, for example:

tunim **tunyem* ‘you (PL) mounted’

In the morphology, for example in the formation of the Imperfective of the causative, the original semivowel reappears when following a plain vowel, e.g.

Aorist	**Imperfective**	
sskᴜ	*sskaw*	‘to dry’
ssnᴜ	*ssnaw*	‘to cook’
sseḥmᴜ	*sseḥmaw*	‘to make hot’

ssani	*ssanay*	'to make/let mount'
ssfi	*ssfay*	'to fester, to overflow'

There is free variation between **yu** and **iw** when the **i**- subject prefix and **u** collide, for example:

yuf ~ iwf	'he found'
yulu ~ iwlu	'he picked (fruit)'

1.7. Back-velar and uvular consonants

x [IPA: χ]
The consonant **x** is a back-velar fricative, tending towards the uvular domain. It is never confused with the velar fricative **k̲** (IPA: [x]).
ixebbeɛ 'he has stored'; *nnexla* 'date palm tree'; *fsex* 'untie!'

x^{w} [IPA: χ^{w}]
This consonant appears only in /tax^{w}est/ which has realisations [taxust] and [ta^{w}xest] and in **tax^{w}ṛaft** 'riddle, story'.

xx [IPA: **χ:**]
taxxunt 'ass'; *aduxxan* 'chimney'; *lfexx* 'bird trap'

ɣ [IPA: ʁ]
The consonant **ɣ** is a back-velar fricative, tending towards the uvular domain. It is never confused with the velar fricative **g̲** (IPA: [ɣ]).This consonant is in morphophonological opposition to **qq**, e.g. in the verb **iɣṛes** 'he slaughtered' - **iqqṛes** 'he slaughters'.
ɣṛes 'slaughter!'; *aḏɣes* 'colostrum'; *iḏeɣ* 'heap of grain'

ɣ^{w} [IPA: ʁ^{w}]
A number of nouns exist that have labialised **ɣ^{w}**. It is not found in initial position.
tizɣ^{w}al 'ladles'; *ffuɣ* (/ffeɣ^{w}/) 'go out!'

q [IPA: q]
quṛṛayes 'type of insect'; *aqezzun* 'dog puppy'; *felleq* 'cut in two pieces!'

qq [IPA: q:]
iqqṛes 'he slaughters'; *taweqqaft* 'door jamb'; *lḥeqq* 'right'

qqʷ [IPA: qːʷ]
This phoneme occurs in the adjective ‘be big’, e.g. masculine **meqquṛ** /meqqʷeṛ/,feminine/plural **muqqṛeṯ** /meqqʷṛeṯ/. Furthermore, the Aorist of a number of verbs have **qqʷ** e.g. **qqul** /qqʷel/ ‘return!’ **uqql-aweṯ** /qqʷl-aweṯ/ ‘return!’ (PL) and **qqun** /qqʷen/ ‘tie!’ **uqqn-aweṯ** /qqʷn-aweṯ/ ‘tie!’ (PL).

1.8. Pharyngeal and laryngeal consonants

ɛ [IPA: ʕ]
ɛuryan ‘naked’; *taɛeddist* ‘belly’; *ixelleɛ* ‘he preserved meat’

ɛɛ [IPA: ʕː]
This consonant is not found in initial or final position.
beɛɛeḏ ‘go away!’; *aḇeɛɛiš* ‘lamb’; *ṛeɛɛeš* ‘make shiver!’

ḥ [IPA: ħ]
ḥenni ‘stoop!’; *aḥenṭwil* ‘tall man’; *ṛṛwaḥ* ‘air’

ḥḥ [IPA: ħħ]
This consonant is not found in initial or final position.
imeḥḥa ‘he erases’; *seḥḥun* ‘they get well’

h [IPA: h]
heṛṛeḇ ‘make flee!’; *taheğalt* ‘widow’; *neddeh* ‘drive, guide!’

hh [IPA: hː]
This consonant is not found in initial or final position.
ifehhem ‘he explains/makes understand’ *dehheṛ* ‘make appear!’ *ṭehheṛ* ‘circumcise!’

ʔ [IPA: ʔ]
This consonant only occurs in borrowings from Standard Arabic, for example:
tʔekked ‘verify!’ *daʔimen* ‘always’

1.9. Status of geminate consonants

Geminate consonants have two sources; they can be the result of assimilations or they are lexically determined[14]. Geminates have more muscular force associated with them and as a result are generally longer that their simple counterparts. Their status is determined by being contrastive with simple consonants (cf. Galand, 2010:49-59). Geminates are considered monophonemic as they cannot be split up by schwa insertion. In the first example **qq** can not be split by schwa as would be expected if it behaved as two consonants (compare **ḵešmen** 'they entered').

qqln > *qqlen* (**qeqlen*) 'they returned'

However, they behave differently from single consonants. A geminate can have schwa's on both sides, behaving like two consonants: the coda of one syllable and the onset of the next syllable.

teqqel 'she returned'

Geminates are neutralised in final pre-pausal position. They become simple (non-geminate) consonants. In non-final environments the geminate surfaces again. In initial and medial position there is no neutralisation. Final geminates are always written with two consonants. Some examples are:

Pre-pausal final		**Non-final**	
ṭaḏuṭ	'wool'	*taḏuṭṭ aḏ*	'this wool'
tamaṭuṭ	'dirty woman'	*tamaṭuṭṭ ahen*	'that dirty woman'
iṭeṭ	'He sucks (breast).'	*iṭṭeṭṭ ahen*	'He sucks them.'
š a s in	'He will say to him.'	*šw a s inna?*	'What did he say to him?'
iggul	'he swore'	*iggull as*	'He swore for him.'
ka-yɛis	'he guards'	*ka-yɛissu*	'they guard'
iṛeš	'he strews'	*iṛešš ahen*	'he strews them (the water)'

[14] Sequences of three homophonous consonants are not allowed. The three consonants are reduced to two e.g. **xeffef** 'be quick, be light' > **txeffet** 'You are light/quick.'

1.10. Summary of stops - fricatives

Spirantisation is a historical process which makes fricatives out of stops. The behaviour of these spirantised consonants differs depending on the position; in some positions the stop is realised while in other positions the corresponding fricative is realised. In initial position, there is a strong tendancy for the stops to appear. In medial position, stops and fricatives are in phonemic opposition. In final position, one in general finds stops after consonants and fricatives after vowels. (C = consonant, V = vowel. The fricative consonants **d̲d̲**, **k̲**^{w} et **ḡ**^{w} and **ḡḡ** are very rare. C**ḍ** is not attested):

Initial position	**Medial position**	**Final position**
b - b̲	*b - b̲*	*Cb - Vb̲*
t	*t - t̲*	*Ct - Vt̲*
d - (d̲)	*d - d̲*	*Cd - Vd̲*
ḍ	*ḍ - d̲*	*(X - Vd̲)*
k - k̲	*k - k̲*	*Ck - Vk̲*
g	*g - ḡ*	*Cg - Vḡ (g)*

1.11. Spread of pharyngealisation

The consonants **t**,**d**, **s**, **z**, **r**, **l** have pharyngealised counterparts **ṭ**, **ḍ**, **ṣ**, **ẓ**, **ṛ**, and marginally **ḷ**. The geminate counterparts of these pharyngealised phonemes are **ṭṭ**, **ḍḍ**, **ṣṣ**, **ẓẓ**, **ṛṛ** and the rare phoneme **ḷḷ**. A pharyngealised consonant causes the spread of pharyngealisation to other consonants which means that they also become pharyngealised. In principle, any consonant can be pharyngealised phonetically except for pharyngeals and laryngeals. The minimum domain of pharyngealisation spread is the syllable and the maximum is the prosodic word which includes verbal and nominal clitics. Furthermore, the spread of pharyngealisation depends on speech tempo (cf. Boukous 1990: 76 for Tashelḥiyt Berber). In the following examples pharyngealisation spreads over the whole word:

lbaṭil	>	[lˤbˤɑtˤelˤ]	‘boat’
ṭṭažin	>	[tːˤɑžˤenˤ]	‘tajine’
ayeffeṭ	>	[ayˤəfːˤətˤ]	‘cattle’
taẓuxt	>	[tˤɑzˤoxˤtˤ]	‘milk’
tamelẓiṯ	>	[tˤɑmˤəlˤzˤiṯˤ]	‘type of plant’
alaẓen	>	[alˤɑzˤən]	‘tomorrow’
iṣeṭṭuḥen	>	[isˤətːˤoḥənˤ]	‘sticks’

iḥeṣṣel	>	[iħəsːˤəlˤ]	‘he falls’
ikemmeṭ	>	[ikˤəmːˤətˤ]	‘it burns’

Pharyngealisation that spreads to a clitic:

iqqṛ as	>	[iqːrˤ ɑsˤ]	‘he tells him/her’
šebbṛan as	>	[šˤəbːˤrˤɑnˤ ɑsˤ]	‘they held for him’

It is by no means a rule that clitics are pharyngealised in this position, compare the following text excerpts:

afeṛṛuž aḏ	>	[afˤəṛːožˤ ɑḏˤ]	‘this rooster’
ṛṛḇiɛ aḏ	>	[ṛːˤḇˤeɛ aḏ]	‘this grass’

2. Vowels

The vocalic system of Ghomara Berber consists of three plain vowels **a**, **i**, **u** and one short central vowel **e** ([ə]; schwa).

2.1. Vocalic system

close	i		u
mid		*e*	
open		*a*	

Vowel a - open-mid front unrounded vowel [IPA: ɛ]

In the pairs below the contrast between **a** and other vowels is shown.

tasaft	‘chestnut tree’
tasift	‘small river’
taslaṯ	‘bride’
asleṯ	‘two years ago’
itɛayan	‘he is searching’
iɛayen	‘he searched’
mul	‘owner’
lmal	‘property’

The vowel *a* [ɛ] is realised as open back unrounded [ɑ] in a pharyngealised environment, for example:

aṭaṛ	[ɑṭɑṛ]	‘leg’
aẓaṛ	[ɑẓɑṛ]	‘root’

Raising of final a

In Ghomara, final **a** is pronounced as a short [e] in word-final position in pausal context (at the end of a phrase, not in other positions).[15] It is found with all types of word classes, although most examples are nouns because of their frequency in phrase-final position in texts.

/g ləhwa/	>	[g-ləhwe]	‘in the rain’
/ɛḏima/	>	[ʕḏime]	‘weak’ (F)
/ṭwila/	>	[tˁwɪle]	‘long’ (F)
/ṭqila/	>	[tˁqele]	‘heavy’
/ləɣḏa/	>	[ləʁðe]	‘lunch’
/lɛaṛbiyya/	>	[lʕɑrˁbːɪyːe]	‘Arabic’
/mya/	>	[mje]	‘hundred’
/tamədda/	>	[tɛmədːe]	‘bird of prey’
/tamezgiḏa/	>	[tɛməzgɪðe]	‘mosque’
/n tsa/	>	[n-tse]	‘of the cow’
/yemma/	>	[jəmːe]	‘mother’
/tamuḏa/	>	[tɛmuðe]	‘sow’
/g teẓḡa/	>	[g-təẓɣe]	‘in the forest’
/assa/	>	[ɛsːe]	‘nowadays’

When there is an adjacent (preceding) pharyngealised, velar, glotal, uvular or pharyngeal consonant vowel heightening does not occur. The following examples do not show vowel heightening in word final position in pausal context.

[15] This vowel heightening is a well-known phenomenon in many Arabic dialects. It exists in differing degrees in the dialects of North-Western Morocco. In Anjra the vowel heightening always occurs in final position or in pausal position and extends from (non-heightened) [æ] to [i] (Vicente, 2000: 28-29). For instance the name *Maliḵa* becomes *Maliḵi* in such contexts. In Chefchaouen it is restricted to word-internal position. Its realisation is [æ] (Moscoso, 2002: 27).

/ḍḍṛa/	>	[dːˤrˤɑ]	‘corn’
/rrḥa/	>	[rːħɛ]	‘hand-mill’
/beṛṛa/	>	[bərːˤɑ]	‘outside’
/weḥda/	>	[wəħdɛ]	‘one’ (F)
/lmeqla/	>	[lməqlɛ]	‘frying pan’
/waha/	>	[wɛhɛ]	‘only’
/tameɣṛa/	>	[tɛməʁrˤɑ]	‘wedding’

Examples of verbs are very few in texts, but they do exist as this example shows:

yemma nn-es he-tẓalla [jəmːɛ nːəs hətzˤɑlːe]
mother of-3S 3FS-pray:IMP
‘His mother prays.’

Vowel /i/ near-close front unrounded vowel [IPA: ɪ]
The vowel /i/ is realised as a near-close front unrounded vowel [ɪ]. In certain environments, often adjacent to an alveolar consonant /i/ is realised as a close front unrounded vowel [i] , e.g. in the following examples:

tizezzraṯan	>	[tɪzəzːrɛθɛn]	‘heyforks’
tiskert	>	[tɪskərt]	‘garlic’
akkil	>	[ɛkːɪl]	‘curdled milk’
inu	>	[ɪnu]	‘my’
aḡḏi	>	[ɛɣðɪ]	‘jackal’
iżi	>	[izi]	‘fly’

The constrast between **i** and other vowels is illustrated in the following examples:

i - a

ssirḏax	‘I wash’ (AOR)
ssarḏax	‘I washed’ (P)
aḡḏi	‘jackal’
ayḏa	‘dog’
aḡelzim	‘pick-axe’
iḡelzam	‘pick-axes’

i - u

azru	‘mill’
zri	‘pound!’

In a pharyngealised environment /i/ is realised as a close-mid front unrounded /e/, for example:

aṭil	[ɑtˁelˁ]	‘grape’
aḡṯiṭ	[ɑɣtˁetˁ]	‘bird’

Vowel u [IPA: u]

This vowel /u/ is realised as a close back rounded vowel [u]. When in contact with a velar, uvular or pharyngeal consonant it is realised as a near-close back rounded vowel [ʊ], e.g.

n uɣyul	[n ʊʁjul]	‘of the donkey’

The vowel is realised as a close-mid back rounded vowel [o] when influenced by a pharyngealised consonant, for example:

teḵṣuṭ	[təxsˁotˁ]	‘she was afraid’

Below we contrast /u/ with schwa.

u - e

iḥḥfuṛ	‘he always digs’
iḥfeṛ	‘he dug’

a-fettiḥ	‘hole’
a-futtiḥ	‘ass’

Vowels in borrowings from European languages, mainly from Spanish, are realised in the same way as other vowels, for example:

stilus	[stɪlus]	‘pens’
rrigalus	[rːɪgɑlus]	‘presents’
lebyixus	[bːyɪxus]	‘old men’
lǧaṭis	[lǧatˁɪs]	‘sailing boats’

legraṛus [ləgrˁarˁus] ‘cigarette’

2.2. Diphthongs

A number of nouns which are borrowed from Arabic have the diphthongs **aw** [au] and **ay** [aɪ]. These are historical diphthongs in Arabic (they cannot be constrasted with (non-existent) **au** and **ai** and therefore they do not form minimal pairs). In mainstream Moroccan dialects the diphthongs have become monophthongs. The forms with diphthongs are sometimes in free variation with forms that have **u** and **i**. Some examples are:

Diphthong aw

ṛṛawẓ	‘rice’
lḥawṭ	‘vegetable garden’
lḥayṭ	‘wall’
ttawḇ	‘cloth’
llawn	‘colour’
lmawža	‘wave’

Diphthong ay

lɣays	‘mud’
lxayṭ	‘thread’
lɣayṭa	‘flute’
ssayf	‘sword’

However in some cases the historical diphthong has become a monophtong, e.g.

lḇit	‘room’

An example of a noun which has **aw** ~ **u** is:

ṣṣawṭ ~ *ṣuṭ*	‘voice’

2.3. Mid central unrounded vowel e [ə] (schwa)

2.3.1. Phonetic realisation

Schwa is realised phonetically in multiple ways. Different realisations are governed by adjacent consonants, but also by intonation. Below a number of consonantal environments are treated. Schwa can be realised as:

- A short near-open central vowel [ɐ] when immediately preceding **x**, **ɣ**, **ḥ**, **q** and **ɛ**, for example:

lwext	[lwɐxt]	‘time’
mdewwex	[mdəw:ɐx]	‘having a headache’
iffeɣ	[ɪfːɐʁ]	‘He went out.’
ṣṣḇeḥ	[sˁːβɐħ]	‘morning’
inneɛneɛ	[ɪnːɐʕnɐʕ]	‘It flourished.’
ḥmeq	[ħmɐq]	‘crazy’

- [ɑ] when it precedes or is between pharyngeal(ised) consonants, for example:

ifekkeṛ	[ɪfəkːɑrˁ]	‘He grabbed.’
inṭeṛ	[ɪntˁɑrˁ]	‘He flew.’

In some cases there is no difference in pronunciation between /ə/ and /a/. Compare the realisation of the Aorist form of the following verb which has /ə/ underlyingly and the Imperfective form which has /a/ underlyingly.

ifeṛṛeḥ	[ɪfərːˁɑħ]	‘He makes happy.’
itfəṛṛaḥ	[ɪtfərːˁɑħ]	‘He always makes happy.’

When a clitic is added the difference shows up. The schwa dissappears whereas the /a/ remains in its position (cf. 2.3. above for schwa insertion rules).

ifeṛṛḥ ahen	[ɪfərːˁħ ɛhən]	‘He makes them happy.’
itfəṛṛaḥ ahen	[itfərːˁɑħ ɛhən]	‘He always makes them happy.’

- Schwa is realised as [u] and [i] before the semivowels **ww** and **yy**. For example:

xewwef	[xuwwəf]	‘to scare’

seyyeḇ [siyyəḇ] ‘to throw’

2.3.2. Phonemic status

Schwa has a special status as a vowel in that its position is partly predictable (cf. Kossmann 1995). Schwa does not appear in open syllables and in final position. Nouns with Berber morphology, with one exception, allow for phonetic schwa which is predictable according to syllable structure, while for many Arabic nouns schwa placement is not predictable. The placement of schwa is predicted by the following procedure: In nouns schwa is inserted from right to left in a cc-string yielding cec (except when there is a -**t** suffix, see below). In the next example schwa insertion applies to the noun.

aḵmz > *aḵmez* ‘nail’

Schwa is not allowed in an open syllable. If it is inserted in the first cc-sequence from the right side and it appears in an open syllable, the resulting form is ungrammatical.

iḵmzan > **iḵmezan* ‘nails’

Therefore schwa must be reinserted in the adjacent left CC sequence to yield the correct form.

iḵmzan > **iḵmezan* > *iḵemzan* ‘nails’

The same applies to other nouns of the same ccc-type as well as other types of nouns, for example:

amḏer ‘branch’
imeḏren ‘branches’

awrez ‘heel’
iwerzen ‘heels’

azreɣmel ‘centipede’
izerɣemlen ‘centipedes’

Some Arabic-morphology nouns abide by the same rule, for example when a feminine suffix is added to a masculine noun:

M:SG		**F:SG**	
lğmel	‘male camel’	*lğeml-a*	‘female camel’

However, there is a group of Arabic-morphology nouns in which the placement of schwa is not predicted by the procedure above. For these nouns we have to assume an underlying schwa at the phonological level[16]. Schwa is not inserted from right to left in a cc-string but can only be analysed as being present underlyingly, as in these examples[17].

lfeṛn	‘clay oven’
nnefs	‘breath’
ṣṣehd	‘heat’
lferg	‘swarm’
lweḥš	‘animal’

There is one Berber-morphology noun in our corpus which has schwa in an unexpected position.

azeb̲g	‘part of the plough’

Feminine singular forms are problematic. The feminine singular suffix -**t** does not participate in the insertion rule (there is a rare suffix -**et**, see III.1.3.2. morphology). Therefore, in this case the schwa insertion rule applies to the base. The feminine form of **ameslem** ‘muslim’ is **tameslemt** ‘muslima’ instead of the expected ***tamselmet** ‘muslima’ according to the rules above. In the feminine plural which has plural suffix -**an** schwa appears in the expected position **timselman** ‘muslim women’. The number of nouns which have schwa’s that change position is quite limited in Ghomara Berber. Another example is:

M:SG		**F:SG**	
azref	‘road’	*tazreft*	‘path’

Schwa insertion applies in the same way to verbs. Schwa is inserted in a cc-string from right to left in Berber-morphology as well as in Arabic-morphology verbs. Compare the following Imperative singular and plural forms of the Berber-morphology verb ‘dig’ and the Arabic-morphology verb ‘cultivate’.

[16] We basically follow the analysis proposed by Kossmann (1995) for Figuig Berber and other dialects to which structure-based syllabification applies.

[17] Marçais (1977:93) notes that the schwa in these nouns is often placed before the liquids **l**, **n** and **r** and the labials **b**, **f** and **m**. As the examples above show this is only a tendency.

ḥfeṛ	‘dig!’	*ḥefṛ-aweṯ*	‘dig!’	(PL)
fleḥ	‘cultivate!’	*felḥu*	‘cultivate!’	(PL)

Sometimes schwa is found following the first consonant in a ccc-stem resulting in cecc-strings instead of the expected ccec. This type is restricted to the following verbs in our corpus.

iwerg	‘he dreamed’
iwešk	‘he got lost’

Some Aorist forms of cc verbs adopt the form ecc instead of the expected cec, for example:

efk	‘give’
ewṯ	‘hit’

Other cc verbs show the cec form:

ẓeṛ	‘see’
neɣ	‘kill’

Verbs of the cccc type, which include reduplicating verbs, allow for three consonants in a row as in the following examples. Schwa is not found in open syllable.

perpren	(< **prepren*)	‘they flew’
selsl-aweṯ	(< **slesl-aweṯ*)	‘bake grain’ (PL)
berɣz-aweṯ	(< **berɣez*)	‘swap’ (PL)

Schwa is found optionally at the beginning of a verb if there is no prefix and there is an initial consonant cluster or a geminate consonant, for example:

(e)fṛeq	‘divide!’
(e)nda	‘go!’
(e)bb	‘take!’

If a full vowel or schwa follows the first consonant, it is not possible to have initial schwa, for example:

feṛq-aweṯ	‘divide!’ (PL)

qeṛṛeḇ	‘come closer!’

Schwa insertion applies at the word level, which includes clitics. The rules spelled out above thus apply to the clitics as well, such as the direct and indirect object pronouns (cf. III.11. for pronouns). Compare the following examples:

inkeṛ	‘he denied’
inekṛ at	‘He denied her.’
iɣeṛs as i flan	‘He slaughtered for someone.’

The following examples show that schwa does not change position when followed by a noun which begins with a vowel, in other words the rule does not apply across word boundaries.

iṛfeɛ ašaquṛ ahen	‘He lifted the axe.’
amka iḵšem aḡḏi	‘When the jackal went in.’
iɣṛes taɣaṭṭ	‘He slaughtered a goat.’

When a verbal subject suffix of the shape ec is followed by a vowel-initial clitic, it becomes **a** in order to prevent schwa in open syllable, e.g.

rewlen leḥšam nnes	‘His children fled.’
rewlan as (**rewlen as*)	‘They fled from him.’
ṭṭfan as teṯ (**ṭṭfen as teṯ*)	‘They caught her for him.’

The rule only concerns the suffixed subject markers and does not apply to the base of the verb. Compare for example:

išebbṛ ay	‘He caught me.’
šebbṛan ay	‘They caught me.’

In sum, schwa is largely predictable through a set of rules in nouns as well as in verbs. There are two exceptions of the following type: the nominal feminine singular suffix **-t** is not part of the schwa insertion rule. The other exception is borrowed nouns of the type CeCC which have unpredictable schwa. For verbs the verbal complex, that is the verb and its clitics, is the domain for which schwa insertion applies. ecc and wecc verbs form an exception to the rules as well. Finally, cccc-verbs allow ccc sequences without schwa insertion.

3. Assimilations

In this section consonant assimilations within the word and over word boundaries (sandhi) are treated together. Virtually all regular assimilations concern alveolar stops and post-alveolar fricatives. There are a number of minor assimilations of other consonants which are in contact. When two alveolar stops are in contact there is a difference between word-internal assimilations and assimilations over word boundaries. Within the word, the result is a geminate, while over word boundaries (including verbal clitics), the result is a simple stop. Voice assimilation is always regressive, except for one case.

3.1. Regressive voice assimilation

t + d > dd

tdafen	>	*ddafen*	'to fight'
itdaḡam	>	*iddaḡam*	'he fetches water'

ḏ + t > t

taḇuṣeyyaḏt	>	*taḇuṣeyyat*	'type of snake'
taɛuqqaḏt	>	*taɛuqqat*	'knot'

Complete assimilation does not obligatorily take place when a **t** suffix is added. Sometimes there is only regressive voice assimilation, for example:

ḏ + t > ṯt

aḥeddaḏ 'a smith'	>	*taḥeddaṯt*	'practice of being a smith'
-	>	*taḥeṛṛuṯt*	'type of insect'

t + d > d

amḵa t d ibb	>	*amḵa d ibb*	'When he brought it.'
tḥemmut dha	>	*tḥemmu dha*	'You are warming up here.'
iğ at das	>	*iğ a das*	'He left her there.'

A special case is the assimilation of the masculine and feminine third person DO pronoun to the deictic clitic **d / id**, for example (cf. also IV.3.3.5. syntax):

tebb as t id	>	*tebb as d id*	'She has brought him hither.'
tebb as tet d	>	*tebb as ded*	'She has brought her hither.'

In sandhi there is regular voice assimilation.

d + t > t t

isafeɣ d taɛeyyalt	>	*isafeɣ t taɛeyyalt*	‘He took out the girl.’
hedda d tamedda	>	*hedda t tamedda*	‘The eagle came.’

The exception the deictic clitic **d / id** when it is in preverbal position, for example:

d + t > d

smana a d tedda	>	*smana a d edda*	‘Where did she come from?’
ma ḥtaž a d teqqul	>	*ma ḥtaž a d eqqul*	‘He did not want to return.’
a d teqqul	>	*a d eqqul*	‘She will come back.’

There is regular devoicing of sibilants when they precede voiceless **t**. The masculine and the feminine forms below show this process.

z + t > st

aɛebbiz	>	*taɛebbist*	‘calf’
amuggaz	>	*tamuggast*	‘stick to pin animals’

ẓ + t > ṣt

amaẓuẓ	>	*tamaẓuṣt*	‘last born’

ž + t > št

ameɛṛaž	>	*tameɛṛašt*	‘someone who limps’

In sandhi regressive voice assimilation takes place as well, for example:

ž + š > š š

ma itɛeṛṛaž ši	>	*ma itɛeṛṛaš ši*	‘He does not limp.’

t + ẓ > d ẓ

a tẓall	>	*a dẓall*	‘She will pray.’

š + d > ž d

š deṣṣaḏ	>	*ž deṣṣaḏ*	‘You will hunt/fish.’

s + d > z d

tenn as d a ɛeqlet..	>	*tenn az d a ɛeqlet..*	‘She told him: will you recognise..?’

When alveolar **s** and **z** precede palatal **š** and **ž** there is regressive assimilation to place of articulation. The result is a geminate consonant.

s + š > š š

ma ɣṛes ši	>	*ma ɣṛeš ši*	'He does not have'

z + ž > ž ž

iggez žeḥḥa	>	*iggež žeḥḥa*	'Zehha went down.'

Finally, there is this irregular assimilation:

bb + ṣ > ppṣ

bbṣel	>	*ppṣel*	'onions'

3.2. Assimilation to pharyngealised consonants

Pharyngealised alveolar stops also have regressive voice assimilation. The resulting consonant is always pharyngealised.

t + ḍ > ḍḍ

ka-tḍɛaf	>	*ka-ḍḍɛaf*	'She loses weight.'
itḍeṣṣa	>	*iḍḍeṣṣa*	'He laughs.'

t + ṭ > ṭṭ

itṭewwal	>	*iṭṭewwal*	'He makes longer.'
itṭeḥḥaḵ	>	*iṭṭeḥḥaḵ*	'He makes laugh.'

ṭ + t > ṭṭ

tamaṭuṭt	>	*tamaṭuṭṭ*	'dirty woman'
tafeṛkuṭt	>	*tafeṛkuṭṭ*	'piglet'

3.3. Assimilation of n and l

There are different assimilations of /**n**/ and /**l**/. Assimilations can be progressive as well as regressive.

n + l > ll ~ nn

When the preposition **n** 'of' is assimilated to the Arabic article **l**, a geminate **ll** or **nn** is the result, e.g.

tlaṯa n leḥšam	>	*tlaṯa l leḥšam*	‘three children’
ḍḍmaɣ n lefqi	>	*ḍḍmaɣ n nefqi*	‘The head of the imam.’

n + **l** > **l**

In other cases a single **l** is the result.

iḵšem fxessen lweḥš	>	*iḵšem fxesse lweḥš*	‘Animals entered upon them.’

n + **r** > **rr**

This assimilation takes places only when the **n** is the verbal prefix, e.g.

nrennu	>	*rrennu*	‘We add.’

l + **n** > **nn**

Within the word boundary the result is a geminate.

a nerwel fḥalna	>	*a nerwel fḥanna*	‘We will flee.’

l + **n** > **n**

Outside the word boundary the **l** is deleted.

g ul n teryalt…	>	*g u n teryalt…*	‘in the middle (heart) of the basket’
kul nnhaṛ	>	*ku nnhaṛ*	‘every day’

The preposition **dar** ‘to’ loses its final **r** when followed by **l** (cf. III.13.2.3. for this preposition). This context often appears, as many borrowed Arabic nouns have the article /l/ initially.

dar lbir	>	*da lbir*	‘to the well’

The **n** assimilates to the place of articulation of the velar and uvular consonants and labial stops, e.g.

nqeṭṭɛ	>	*ɴqeṭṭeɛ*	‘We cut.’
š a ngix	>	*š a ŋgix*	‘I will push.’
n-bheṭ	>	*m-bheṭ*	‘be astonished’

3.4. Long distance assimilation and metathesis

There is irregular distant voicing of voiceless alveolar consonants when they are followed by the deictic clitic **d** surrounded by voiced consonants (and vowels), for example **asen** becomes **azen**, and the final **t** of the verb becomes **d**.

he-ttiṯu	*a*	*azen = d = te-bb*
3FS-go:I	AD	3PL:IO = DC = 3FS-take:A

'She goes to bring for them.'

te-bba-d = ay = d	*aṭerraš*	*n*	*waman*
2S-take:P-2S = 1S:IO = DC	jar:EL	of	water:EA

'Bring me a jug of water.'

The particle **d** 'hither' and the first person plural prefix **n** optionally change position[18].

a ḵ d nerry ah d	>	*a ḵ nderry ah d*	'We will return it for you.'
a d neqqul	>	*a ndeqqul*	'We will return.'

3.5. Voicing of first person singular suffix -ax

The first person singular suffix is -**ax** (cf. III.7.2. morphology). In the next example the verbal suffix is followed by a voiceless consonant:

ẓẓeṛq-ax	*tiḡura*	*inu*
close:P-1S	doors:EL	POSS-1S

'I close my doors'

When followed by a vowel or a voiced consonant the first person singular suffix becomes -**aɣ**, for example:

nn-aɣ = aḵ	*i-ɛella*
say:P-1S = 2MS:IO	3MS-go.up:P

'I told you he went up'

d	*a*	*xebbɛ-aɣ*	*zdu*	*ugeğuf*
CRT	AD	hide:A-1S	under	bush:EA

'I will hide under a bush'

[18] In some verbs such as **aḡum** ~ **daḡum** the **d** has become a fixed element of the verb.

3.6. The Arabic article l-

The Arabic article **l-** assimilates regularly to post-alveolar consonants, some examples are:

ddin	‘religion, debt’
ssḇeɛ	‘lion’
ttawḇ	‘cloth’
zzif	‘handkerchief’
ššfeṛ	‘eyelid’
ṛṛas	‘cape’
ṭṭḇiḇ	‘doctor’

In many Morrocan Arabic dialects the article assimilates to **ž** yielding **žž**. In Ghomara **ž** becomes an affricate **ǧ** under the influence of **l-**. The article does not assimilate, for example:

lǧmel	‘camel’
lǧeld	‘skin, hide’
lǧim	‘pocket’
lǧen	‘ghost’

Furthermore, the article can assimilate to the labial consonants **b**, **p**, **m**, **f**, the velar stop **k** and the uvular stop **q**. The article can be assimilated completely, with a geminate consonant as a result, or partially resulting in a hardly audible **l**. This (partial) assimilation only takes place if a consonant cluster follows the article. If the article is followed by a consonant and a vowel there is no assimilation. If asked to pronounce the word slowly, the speakers pronounce the article and the geminate consonant. In that case there is a very short schwa between the article and the geminate. The article is therefore put between brackets in these examples. Compare the following nouns.

lpeṣṣiṭa	‘peseta’
(el^{e})ppṣaṣeṭ	‘pesetas’
lberdaɛ	‘saddle’
(el^{e})bbḥar	‘sea’

In the words **lɛaṛbiyya** ‘Arabic’ and **aṛbbɛa** ‘four’ have a geminate **bb**. This might be the result of the preceding **ṛ** which has the same effect as the article **l-**.

lmaliḵ	‘king’

(el^{e})mmḏina	‘city’
lfellaḥ	‘farmer’
(el^{e})ffḥel	‘bull’
(e)lkelma	‘word, speech’
(el^{e})kksir	‘big field’
(e)lqent	‘corner’
(el^{e})qqḇuṛa	‘graves’

3.7. Dropping of final consonants

Certain consonants in final position can be elided in Ghomara Berber (and Arabic). Following a vowel (**a**, **i**, **u**, **e**) the consonants **n**, **l**, **ḏ** and **ṯ** can disappear. This differs according to speech tempo. Some examples are:

n			
s warsin	>	*s warsi*	‘with hunger’
l			
itseğal	>	*itseğa*	‘It records.’
ḏ			
ɛaweḏ	>	*ɛawe*	‘again’
ṯ			
sskuṯ	>	*ssku*	‘be quiet’

3.8. Vocalic sandhi

When there are two consecutive vowels the following procedures take place:

Insertion of a semi-vowel

A glide **y** is inserted between **a** + **a**, **a** +**i** and **i** + **a**, for example:

lheḍṛa ahen	>	*lheḍṛa y ahen*	‘that talk’
ɣa aɛeyyal	>	*ɣa y aɛeyyal*	‘only a boy’
idda iḏes	>	*idda y iḏes*	‘He went with him.’

lefqi aḏ	>	*lefqi y aḏ*	‘this imam’
aḡḏi ahen	>	*aḡḏi y ahen*	‘that jackal’

Vowel becomes semi-vowel

a + **i** > **a y**

idda išebbeṛ	>	*idda yšebbeṛ*	‘He went to grab.’
netta isker	>	*netta ysker*	‘he did’
ddwa inši	>	*ddwa ynši*	‘some drugs’

u + **i** > **u y**

š ifelḥu iḇawen	>	*š ifelḥu yḇawen*	‘They are going sow beans.’
zdu izref inši	>	*zdu yzref inši*	‘under some road’

i + **i** > **y** + **i**

maši iḏ izref	>	*mašy iḏ izref*	‘going along the road’

a + **u** > **a w**

ɣa lfurma u ṣafi	>	*ɣa lfurma w ṣafi*	‘Just the form, that is all.’
ya usammer	>	*ya wsammer*	‘a sunny hill’

i + **u** > **i w**

i uɛeyyal	>	*i wɛeyyal*	‘and the boy’

u + **a** > **w a**

iddu am siha daryan	>	*iddw am siha daryan*	‘He goes from here to there.’
hettiṯu azen d ebb	>	*hettiṯw azen d ebb*	‘They go and take for her.’

Vowel loss

a + **a** > **a**

If two **a**’s of a verb and a noun come into contact, the result is reduction to one **a**. Otherwise a glide **y** is inserted (see above).

idda argaz	>	*idd argaz*	‘The man went.’
idda aɣižd	>	*idd aɣižd*	‘The billy goat went.’

u + **u** > **u**

zdu ugeğuf	>	*zdu geğuf*	‘under a bush’

4. Labialisation

Ghomara Berber has a number of labialised velar and uvular consonants. The short labialised consonants are **k^{w}**, **k̲^{w}**, **ḡ^{w}**, **g^{w}**, **x^{w}**, **ɣ^{w}**, the geminate consonants are **kk^{w}**, **gg^{w}**, **qq^{w}**.

4.1. Realisation of labialisation

Labialisation of a consonant is realised phonetically in different ways. In the following the phonetic realisation will be discussed. Labialised consonants will be represented by the abstract character G^{w}. The behaviour of labialised consonants can be captured by a few basic rules. However, some specification is required.

Rule 1

The following rule applies to the base of the word: If there is a schwa position adjacent to the labialised consonant, this position is realised as [**u**]. Phonetically it is indistinguishable from the plain vowel /**u**/.

eG^{w}c >	uGc	
i-suɣn-an	*/i-seɣ^{w}n-an/*	‘ropes’
š a lukm-et	*/ š a lek^{w}m-et/*	‘You will arrive.’

cG^{w}e >	cGu	
a-syun	*/asɣ^{w}en/*	‘rope’
ssenkur	*/ssenk^{w}er/*	‘make stand up’

eG^{w} >	uG	
š a ffuɣ	*/š a ffeɣ^{w}/*	‘He will exit.’

In cases where a three-consonant cluster appears in which the labialised consonant is in the middle, the (non-adjacent) schwa in the base is realised as **u**. A schwa position in the affixes can not be realised as **u**.

ecG^{w}c >	ucGc	
š a ssunkr-et		‘You will make stand up.’

Rule 2

If there is no schwa adjacent to the labialised consonant, labialisation is basically realised on a consonant position. In consonant clusters, it is the first consonant of the cluster that takes the labialisation, irrespective of whether it is a velar/uvular consonant or not – put

otherwise, in G^w-final clusters the labialisation is transferred to the whole cluster. Rounding of the lips already starts before the velar/uvular consonant is uttered.

G^wcV	>	G^wcV	
a-^{w}ɣlal			‘loam pot’

cG^wV	>	c^{w}GV	
ti-^{w}zɣal			‘ladles’

G^wce	>	G^wce	
a-^{w}k̲ser			‘piece of bread’

Rule 1 only applies within the base of a word; schwa which is part of an affix is not coloured by a preceding labialised consonant; instead the labialisation is realised on (and before) the labialised consonant (cluster), e.g.:

ecG^w	>	ucG	
š a ssurɣ-em			‘You will light.’

In the case where there is no schwa preceding the cluster, the whole consonant cluster takes the labialisation.

cG	>	wcG	
š a ff^{w}ɣ-em			‘You (PL) will go out.’

In the transcription used here, we use a phonetic transcription of what is phonemically labialisation, writing **u** where it is realised as **u** (i.e. in schwa position) and, where labialisation is not realised as **u**, with a ^{w} on the labialised member of the consonant cluster, i.e.

š a ffuɣ	/š a ffeɣ^w/	‘He will go out.’
š a ffɣ^w-em	/š a ffɣ^{w}em/	‘You will go out.’

4.2. Analysis of labialisation

As follows from the presentation above, an adjacent labialised consonant causes /e/ to be pronounced /u/. This pronunciation leads to a merger with the plain vowel /u/. The difference between [u] as an allophone of /e/ and [u] as a realisation of /u/ can only be established on the basis of the general phonotactic restrictions to the placement of schwa

(see 2.3.) which also apply to its allophones, including [u]. The vowel /e/ cannot stand in an open syllable. On the other hand, there is no restriction whatsoever to having the plain vowel phoneme /u/ in an open syllable. As a result, [u] (/e/) disappears in contexts where it would be in an open syllable, while [u] (/u/) is maintained. This can be shown by comparing the Imperative forms of two verbs. In the Imperative singular they both have [u]:

A.	*(e)qquṛ*	'dry up!'	IMP.S
B.	*(e)qqul*	'return!'	IMP.S

When the plural Imperative marker is added, they behave differently. In example A **u** maintains its position while in example B **u** shifts to initial position.

A.	*qquṛ-awet̲*	'dry up!'	IMP.PL
B.	*uqql-awet̲*	'return!'	IMP.PL

The same happens in the next examples in which the difference between fixed and flexible **u** shows up.

A.	*(e)kku*	'dry up!'	IMP.S
	(e)kkw-awet̲	'dry up!'	IMP.PL
B.	*(e)kkur*	'stand up!'	IMP.S
	ukkr-awet̲	'stand up!'	IMP.PL

From this, we conclude that the verbs in examples A have a plain vowel /u/ (/eqquṛ/, /ekku/), while the [u] in the other verbs is a realisation of the labialisation of the adjacent consonant on a contingent schwa (i.e. /**eqq^{w}el**/, /**ekk^{w}er**/). There exists an opposition between pre-labialised realisations and forms which have a genuine /**w**/. In pre-labialised realisations, schwa is not inserted where expected according to schwa-insertion rules, while (under the right circumstances) there is no impediment to inserting schwa after /**w**/. Compare the following examples:

A.	*š a weɣlem*	'You (PL) will be stuck.'
B.	*š a uqqlem* **(***š a weqqlem***)**	'You (PL) will return.'

It is impossible to insert schwa in cases like example B between the perceived **w** and the following consonant.

Our corpus contains one minimal pair which shows that labialisation is phonological.

A.	*aɣlal*	‘sea snail’
B.	*aɣ^{w}lal*	‘loam pot’

In some words, labialisation is optional:

taɣ^{w}zalt ~ *taɣzalt*[19]	‘bogue’ (fish sp.)
tizɣal ~ *tiz^{w}ɣal*	‘ladles’
neɣ ~ *nuɣ*	‘kill!’
ffeɣ ~ *ffuɣ*	‘go out!’
š a rɣen ~ *š a r^{w}ɣen*	‘They will be lit.’
ffɣ-awet̲ ~ *uffɣ-awet̲*	‘go out!’ (PL)
lkem ~ *lkum*	‘arrive’

There is one word which in an irregular manner, allows labialisation to be realised both as pre- and as post-labialisation:

taxuṣt ~ *ta^{w}xeṣt*	‘molar tooth’

As mentioned above, when labialisation is realised by the allophone [u] of schwa, it is only possible to establish its phonological interpretation because of the existence of other forms. Of course, there are quite some words for which this is impossible to ascertain. This is especially the case of words which have no forms where /e/ would appear in an open syllable, e.g.

A.	*taɣuṣmaṛt*	‘jaw’
B.	*tiɣuṣmaṛan*	‘jaws’

There is nothing that allows us to decide whether these forms are phonologically /taɣuṣmaṛt/, /tiɣuṣmaṛan/ or /taɣ^{w}eṣmaṛt/, /tiɣ^{w}eṣmaṛan/.

[19] The Berber-morphology noun **taɣzalt** ‘bogue’ is used in the neighbouring Arabic dialects and in the Arabic-speaking city Tetouan as well. The neighbouring Arabic dialects do not show the same type of (pre)labialisation as Ghomara Berber.