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Proto-Berber heavy verbs

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Contents

Introduction	307
The Perfective Vocalism	310
Application of the A- Θ -A $\rightarrow$ Vocalism to Quadrisyllabic Stems	311
The Aorist Vocalism	312
The Imperfective Formation	315
The Classification of Middleweight Verbs	316
Conclusion	318
Appendix	319
Class 1 (Aor. Θ -A $\rightarrow$)	319
Class 2 (Aor. Θ $\rightarrow$)	326
Bibliography	332

Introduction

The complexities of Berber verbal morphology have long been recognized, and its reconstruction has been undertaken by several authors, most notably by Prasse (1973). In principle we can distinguish between several general verb types, which

In order to not give a false sense of specificity, this chapter uses the regular Berberological transcription in the Proto-Berber reconstructions using z and d for the emphatics, y for the back voiced fricative, ə and ā for the central vowels, and k and g for the palato-velars. Transcriptions of living dialects have adopted the transcription of this volume using IPA. The only deviation I adopt is that I use ā for the low central vowel in dialects that distinguish it from ə rather than the IPA sign $[\text{ɐ}]$, and geminates are indicated with doubled consonants $[\text{dd}]$ rather than $[\text{d:}]$.

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Heath (2005) has classified for Tuareg as “light verbs” (verbs with two stem vowels) and “heavy verbs” (verbs with more than two stem vowels).

The most common class of light verbs, which shares many similarities with the Proto-Semitic verbal system, as recently examined by Kossmann and Suchard (2018), was first reconstructed for Proto-Berber by Prasse (1973), and received important updates by Kossmann (2001a), especially integrating the newly discovered Proto-Berber consonant *ʔ, and making the reconstructions somewhat less Tuareg-centric. The heavy verbs, however, have not yet received the same attention. This chapter aims to reconstruct these heavy verbs.

Besides the light and heavy verbs, there is at least one other verb class that seems to be reconstructible for Proto-Berber, namely, the set of (mostly stative) verbs that have an *i- or *u- in the initial syllable of the Aorist and Imperfective, e.g., *ini “to say,” and *uksuḍ “to be afraid.” These verbs will have to be discussed in a later publication.

Unlike other Berber languages, Tuareg, Ghadames, and Zenaga Berber¹ retain a distinction between two central vowels **ǣ* and **ə*, which have merged in the other Berber languages to a single central vowel *ə*, of questionable phonemic status. This central vowel distinction plays an important role in the apophony of the different verb forms in the languages that retain the contrast. While there are several in-depth descriptions of the heavy verbs in a variety of different Berber dialects, and cross-dialectally (e.g., Boumalk 2003, for Tashelhiyt; Dallet 1953, for Kabyle; and Basset 1929, for a comparative description), no attempt at the reconstruction of the Proto-Berber heavy verbal system has been undertaken and an integration of especially the Tuareg, Ghadames, and Zenaga Berber data into this comparative perspective has also not been undertaken in great detail.

Tuareg displays an astounding number of “heavy verb types,” which Prasse (1973) classifies into 15 different conjugations, with many different subtypes. However, these conjugations share more similarities with each other than that they do with the basic “light verbs,” and recently several authors have significantly reduced the Tuareg heavy verb categories to a significantly smaller subset. Sudlow (2001) takes the classification of Prasse (1973, which in itself was already a simplification of de Foucauld 1950), and reduces it to five basic heavy stems – a similar reduction created by Heath (2005). Kossmann (2011) reconstructs four apophonic classes, which he further reduces to only two general patterns on a historical level (Table 15.1).

Table 15.1 Tuareg apophony

	Aorist	Perfective
Type 2	Θ→	A-Θ-A→
Type 3	A→	Θ-Θ-A → (< *A-Θ-A→)

¹ In Zenaga Berber the distinction between plain vowels **a*, **i*, **u*, **e*, and the central vowels **ǣ* and **ə* is largely lost, generally merging **a* and **ǣ* to a single phoneme /a/ and **ə* to **i* or **u*, depending on the phonemic environment.

Kossmann envisions these vowel patterns to be assigned to the vowel slots of a stem from left to right, and every vowel that follows after the defined vowel will copy the preceding vowel. A gives rise to *ǎ* on central vowel slots, and *a* on plain vowel slots; whereas *Θ* gives rise to *ə* in central vowel slots, and *i* or *u* in plain vowel slots. As such, a verb such as *vmvnu²kv²l* “to be a chief” (a type 2 verb) can be assigned an Aorist and Perfective, as follows:

Apophony of *vmvnu²kv²l*

Aorist	Perfective
Θ-Θ-Θ-Θ	A-Θ-A-A
<i>əmənukəl</i>	<i>ǎmnakāl</i> (< * <i>ǎmənakāl</i>)

In Kossmann’s work on Ghadames (Kossmann 2013a: 66–74), a similar apophonic class system is identified (Table 15.2).

The third Berber language that also retains the central vowel contrast between **ǎ* and **ə*, Zenaga, is also identified as having a very similar system by Cohen and Taine-Cheikh (2000: 291ff.). Only one clear type is visible in Zenaga, which corresponds mostly to Tuareg Type 2 and Ghadames Class 2. A smaller subtype has A-type vowels in the middle vowel slot, both in the Aorist, and the Perfective. This subtype has no clear parallels in other Berber varieties, and it is, therefore, difficult to decide where it comes from, and how it relates to the verbal type attested in the other varieties (Table 15.3).

Kossmann (2012: 43f.) already observed several of the similarities in vowel patterns of these heavy verbs across the different Berber languages and this chapter wishes to further expand on their linguistic history. The similarities in these systems, across very widespread Berber varieties, makes it highly likely that this is an old system that may be reconstructed to Proto-Berber. In this chapter, I aim to reconstruct the different apophonic classes present in the Proto-Berber heavy verbs, and will show that the systems reconstructible from these *ə/ǎ* contrast–retaining dialects are corroborated by the dialects that have lost this contrast in the outcome of plain vowels in the stem.

Table 15.2 Ghadames apophony

	Aorist	Future	Perfective
Class 2	Θ→	= Aorist	A-Θ-A→
Class 3	Θ→	Θ-A→	A-Θ-A→
Class 4	Θ-A→	= Aorist	A-Θ-A→

Table 15.3 Zenaga apophony

	Aorist	Perfective
Basic	Θ-Θ-Θ	A-Θ-A
Mid-A:	Θ-A-Θ	A-Θ-A/A-A-A

²Central vowel slots are designated with *v*, whereas plain vowels are generally marked with the plain *a*, *i*, or *u*, as it appears on the Aorist.

Throughout this chapter several verbs will be cited, which return in the appendix. These verbs are marked by {#}, where # is the corresponding number in the appendix. In the appendix, one can also find the abbreviations used for the different Berber varieties, and the sources consulted.

The Perfective Vocalism

The perfective vocalism of the heavy stems is clearly reconstructible from the comparative evidence available to us. Ghadames and Zenaga point to a vocalism A- Θ -A $\rightarrow$ in the perfective, while Tuareg, either has Θ - Θ -A $\rightarrow$, or A- Θ -A $\rightarrow$. The former Tuareg pattern can easily be understood as being the result of an active Tuareg-internal vowel harmony that shifts any $\check{a}$ preceding ∂ to ∂ (Kossmann 2011: 57 f.). This is clear from the fact that the third-person masculine plural pronominal object clitic =*tān* undergoes vowel harmony to =*tən* when the following vowel is ∂ , when it is in fronted position – while, when it comes after the verb, it remains =*tān* (Kossmann 2011: 22).

Vowel harmony of $\check{a}$ to ∂ in Tuareg

<i>əkrəd=tān</i>	“attach them!”
<i>a=tən=yəkrəd</i>	“he will attach them”

This vowel harmony does not apply when the medial high vowel is *u*: in such cases therefore the initial $\check{a}$ reappears (Kossmann 2011: 57), cf.:

P *əqqəṭās* “be cut” < **āqqəṭās*
 P *āggolāz* “be left over” < **āggulāz*

As such, the A- Θ -A $\rightarrow$ pattern can be reconstructed as the perfective vocalism of the heavy stems in all three varieties.

Traces of this pattern can also be recovered in Berber varieties that have lost central vowel contrast, e.g., Central Moroccan Berber retains a reflex -*a* of word-final *- $\check{a}$?; whereas *- ∂ ? has no reflex (Kossmann 2001a). Perfectives of heavy roots with final glottal stop, therefore, consistently have a zero-reflex in the aorist and a final *a* in the perfective.

{4} **āqqəymā?* “to sit,” CMB *qqima* (A *qqim*); Tu. *āqqim*; Ghd. *āqqim*
 {5} **āffəstā?* “to be silent,” CMB *fəsθa* (A *fəsθ*); Ghd. *āfəss*; Zng. *āffus^sʿa?*

Likewise, nouns that have a plain vowel as the second vowel slot will shift it to the expected high vowel in the stem. The vowel usually becomes *u*, unless a consonant *w* follows it, in which case it regularly becomes *i*.³

³This same shift is attested in the light verbs, with an initial plain vowel followed by *w*, cf. A **agəm* P **ugām* “to draw water,” but A **awəd* P **iwād* “to arrive.”

- {13} **ǎǎgǎllǎ*? “swear,” CMB *ggulla* (A *ggall*)
 {10} **ǎyyiwǎn* “be full,” Fig. *dziwǎn* (A *dzawǎn*)

From this evidence, it seems safe to conclude that the perfective vocalism A- $\text{\textcircled{A}}$ -A $\rightarrow$ is not only present in Tuareg, Ghadames, and Zenaga, and traces of it can be found in many Berber varieties that have lost the short vowel contrast, as such this vocalism can be reconstructed for the Proto-Berber heavy verb.

Application of the A- $\text{\textcircled{A}}$ -A $\rightarrow$ Vocalism to Quadrisyllabic Stems

In Tuareg, whenever the perfective vocalism A- $\text{\textcircled{A}}$ -A $\rightarrow$ is applied to a quadrisyllabic stem, the first three vowels will be applied to the first three vowel slots of the stem, and the last vowel copies the preceding vowel, e.g.,

- {30} A *ǎgriwǎl* (Imp *ǎgriwǎl*) P *ǎgrawǎl* “to turn” < **ǎǎgǎrawǎl*
 {31} A *ǎfriwǎs* (Imp *ǎfriwǎs*) P *ǎfrawǎs* “to be joyful” < **ǎǎfǎrawǎs*
 {20} A *ǎkrurǎy* (Imp *ǎkrurǎy*) P *ǎkrarǎy* “to be round” < **ǎǎkrarǎy*

As there are not many verbs of this type with widespread cognates, it is not very easy to confirm that this A- $\text{\textcircled{A}}$ -A $\rightarrow$ vocalism was applied in the same way to quadrisyllabic stems in other Berber languages.

For verbs with a vowel *i* in the stem, there is basically only one verb that has widespread cognates. While this verb’s reconstruction presents some problems, the stem vowel *i* that becomes *a* in the Perfective seems reconstructible. This verb however lacks cognates in Tuareg:

- {32} **ǎrǎǎǎǎǎǎǎ*?/y P **ǎrǎǎǎǎǎǎǎ*?/y “to tremble”
 Tashl. *rgigi* P *rgagi*; Kb. *rjiji* P *rjaji*
 Zenaga *ǎrgǎgi* P *ǎrgǎǎǎ*

There is one other that is a potential cognate between CMB and Kabyle with this alternation, but I have found no other cognates:

- {33} **ǎmǎlilǎ*? P **ǎmǎlalǎ*? “to meet one another”
 Kb. A *mlil* P *mlal* “to meet”
 CMB (Ayt Atta) *lmili* P *lmala* “to be close-by” (Mauri 2015: 161)

This alternation is regular for this type of verb in Kabyle Berber (Dallet 1953: 412), while it is rare and only found in isolated verbs in other varieties.

- {31} Kb. A *friwǎs* < **ǎfriwǎs* P *frawǎs* < **ǎǎfǎrawǎs* “to jump up”
 Kb. *jrirǎβ* P *jrarǎβ* “to roll; tumble”
 Kb. *flili* P *flali* “to emerge”
 Kb. *firi* P *firi* “to glide”
 Kb. *ǎlil* < **ǎǎlilǎ*? P *ǎlal* < **ǎǎlalǎ*? “to merit; deserve”

However, also $\bar{c}icc$ stems have this i/a alternation in Kabyle, an environment where Tuareg, or any other Berber language seems to undergo this alternation, e.g., Kb. *zziḩar* P *zzaḩar* “to twist; to make a string”.⁴ This alternation is, presumably, analogically spread from the $ccicc$ verbs discussed above, but it is difficult to be sure.

In most other Berber varieties, this alternation has been leveled out. Tashlhiyt, for example, gives no indication of this alternation:

{30} Tashl. A *griwl* P *griwl* “to turn” not ***grawl*

On the basis of the isolated verbs that have the alternation of Tuareg it seems likely that we can reconstruct this alternation to Proto-Berber for verbs with a stem-internal i after two consonants. However, verbs that have a vowel u in this position hardly ever give evidence for this alternation outside of Tuareg, e.g.,

{22} Kb. *fruri* P *fruri* “to drop fruits or seeds;” Tashl. *fruri* P *fruri* “to drop fruits or seeds;”

CMB *frury* P *frury* “to drop fruits or seeds,” not ***frary*.

{20} Tashl. A *krurri* P *krurri* “to be round,” not ***krarri*

The treatment of verbs with a root-internal u in Ghadames follows the majority of the Berber varieties. While it normally applies the A- Θ -A $\rightarrow$ pattern to heavy verbs in the perfective, for verbs of this type, we find a pattern A- Θ - Θ -A, meaning that the u is not changed to a :

{21} Ghd. *gnunni* < **əkənnunəy* P *āgnunne* < **ākənnunāy* “to roll”

{24} Ghd. *əḡlulu* < **əḡəlulu* P *āḡəlula* “to hang,” Fig. A = P *ylulu* “id.”

Basset (1929: 90, 93) records one Kabyle verb with the alternation as found in Tuareg *grurəz* P *grarəz* “to fall into ruin.” This form is not recorded by Dallet in his dictionary. He also records (optionally) the alternation for several verbs in Ida u Semlal: *mdudu* P 1sg. *mdudaḩ/mdadaḩ* “to have insolation” and *flufu* P *flufa* “to boil,” but plural perfective participle *flafanin*.

While the evidence for u/a alternation in verbs of this type outside of Tuareg is even more sparse than it is for the i/a alternation, the fact that it occasionally shows up in fairly disparate varieties of Berber suggests that Tuareg does reflect the original situation, despite this vocalization being lost in most varieties.

The Aorist Vocalism

The Aorist presents a more complicated situation than the Perfective. It is clear that in Tuareg there are two vocalisms, (1) an A $\rightarrow$ vocalism, and (2) an Θ $\rightarrow$ vocalism (Kossmann 2011: 58).

⁴This verb is clearly deverbal from *izikər* “rope.”

A→: Tu. A *āqqātās* P *āqqātās* “to be cut”

Θ→: Tu. A *āggulāz* P *āggolāz* “to be left over”

Zenaga usually points to an Θ→ vocalism even where most Berber languages point to a vocalism containing A-type vowels. This is likely a secondary development (Cohen and Taine-Cheikh 2000: 292):

{8} Zng. A *y-uruʔri* P *y-āruʔrā* “vomit”; CMB *rar* P *rura* “id.”

{12} Zng. A *y-iyiyi* P *y-āyiyā* “be born”; Tam *lal* P *lula* “id.”

{3} Zng. A *y-āddurkiy*⁵ P *y-āddurkāy* “be blind”; Tu. *āddārkal* P *āddārkal* “id.”

In two cases, an A-A-Θ vocalism surfaces as an alternative vocalization for the final glottal stop verbs, once in the clearly reconstructible verb “to be quiet,” and the Arabic loanword “to pray”:

{5} Zng. A *y-uffūsʹsʹi*, *y-affāsʹsʹi* P *y-āffūsʹsʹa* “be silent”; Ghd. *fəss* A *āfəss*

{15} Zng. A *y-usʹsʹulli*, *y-asʹsʹalli* P *y-asʹsʹəllä* “pray”; CMB *zʹzʹall* P *zʹzʹulla*

It is tempting to see in the A-A-Θ vocalism the A→ vocalism found in Tuareg, but the exact development is not clear.

A few cases exist in Zenaga where the Aorist has a Θ-A-Θ vocalism; in these cases, the perfect has an A-A-A vocalism:

Zng. A *y-inmāræg* P *y-ānmāræg* “to resemble”

Zng. A *y-əfwādi:h* P *y-āfwāda:h* “envoyer”

No traces of this subtype can be found in Tuareg or Ghadames. Both words identified by Cohen and Taine-Cheikh (2000) with this vocalism lack clear Proto-Berber etymologies, it is, therefore, difficult to evaluate whether this lexically determined vocalism is an archaism, or rather, an innovation of Zenaga.

Whatever the exact development of the subtypes, it is clear that the Θ→ vocalism can be readily identified with the identical Θ→ vocalism found in Tuareg (and Ghadames) – and that it has been generalized across many verbs where Tuareg has an A→ vocalism in the Aorist.

The situation is more complex for Ghadames. Unlike Tuareg and Zenaga, Ghadames has three different aspectual forms, which all perform different parts of the functions where Tuareg and Zenaga only use the Aorist, namely, the Imperative, Aorist, and Future.⁶ There are four different combinations. Type 1 has Θ→ for all three aspects. Type 4 has Θ-A(-Θ) for all three aspects. Both, Type 2, and Type 3 have Θ-A→ for the Future, but the Imperative, either agrees with the Aorist Θ→ vocalism (Type 2), or with the Future Θ-A→ vocalism (Type 3).

⁵This must be a loanword from another Berber language, as Proto-Berber **y* yields *ʔ* in Zenaga (Kossmann 2001a: 63–65; Souag 2017).

⁶For an overview of the function of these stems see Kossmann (2013a: 161ff.).

	Type 1	Type 2	Type 3	Type 4
Imperative	(Θ -) Θ - Θ <i>fənzər</i> “have a nosebleed”	Θ - Θ - Θ <i>əmmiɬəf</i> “be entered”	(Θ -)A-A <i>māklaw</i> “take lunch”	(Θ -)A(- Θ) <i>fad</i> “be thirsty”
Aorist	Θ - Θ - Θ <i>əffənzər</i>	Θ - Θ - Θ <i>əmmiɬəf</i>	Θ - Θ - Θ <i>əmməkluw</i>	Θ -A(- Θ) <i>əffad</i>
Future	Θ - Θ - Θ <i>əffənzər</i>	Θ -A-A <i>əmmatāf</i>	Θ -A-A <i>əmmāklaw</i>	Θ -A(- Θ) <i>əffad</i>

Other Berber varieties such as Tuareg have a separate Imperative as well, but they never differ in vocalism, but only clip off the first vowel and shorten the initial geminate.

- Tu. Imp. *ɛātās* A *āqqātās* “to cut”
 {4} Tu. Imp. *ɛāym* A *āqqāym* “to sit”
 Tu. Imp. *dubən* A *əddubən* “to marry”

This same process of clipping and shortening is present in Ghadames as well (Kossmann 2013a: 78):

- {5} Ghd. Imp. *ǰäss* A *yāffäss* “to be quiet”
 {7} Ghd. Imp. *βərgⁱ* A *əββərgⁱ* “to dream”

The Tuareg and Zenaga $\Theta \rightarrow$ vocalism can be readily equated with the Ghadames vocalism $\Theta \rightarrow$ (Type 1). The Tuareg Aorist A $\rightarrow$ should probably be equated with the Ghadames Θ -A $\rightarrow$ vocalism. However, these are not perfectly identical, and the question becomes which of the two vocalisms is original to Proto-Berber.

To my mind, it is more likely that the more complex Θ -A $\rightarrow$ vocalism is original, as it seems difficult to arrive at this vocalism from an A $\rightarrow$ vocalism while the Tuareg A $\rightarrow$ vocalism could be derived analogically from an original Θ -A $\rightarrow$ vocalism through the imperative. As already discussed, the imperative clips off the first vowel of heavy stems, and degeminates the word-initial consonant. This yields an A $\rightarrow$ vocalism for the Imperative in Ghadames as well, by virtue of the initial vowel having been clipped. Tuareg could have introduced an innovative A $\rightarrow$ vocalism to the Aorist from the imperative, which in Tuareg is otherwise identical to the Aorist.

Another argument that speaks in favor of the reconstruction of the Proto-Berber Aorist vocalism as Θ -A $\rightarrow$ is that it is the vocalism used in both Tuareg and Ghadames for the Imperfective. In several other verb types,⁷ the Imperfective takes on the same vocalism as the Aorist, so it seems likely that this would also be the case for the Heavy Verbs.

As such, it seems reasonable to assume that the Aorist vocalism of Tuareg was originally identical to that of the imperfective and, thus, also had an

⁷ Verb types that copy the vocalism of the Aorist for the imperfective are most prominently verbs with initial *i*- or *u*- prefixes, e.g., A *ini* “to say” P *ənna* I *ətini* (Prasse’s I.C verbs); A *irsan* “to be tired” P *ārsin* I *ətirsan* (Prasse’s II verbs), and the heavy verbs with an $\Theta \rightarrow$ vocalism in the Aorist, as we will see in section “[The Imperfective Formation](#)” below.

Θ -A $\rightarrow$ vocalism. Therefore, for Proto-Berber it seems possible to reconstruct two main vocalisms in the Aorist, $\Theta\rightarrow$ and Θ -A $\rightarrow$, the latter of which usually corresponds to the Ghadames Future stem.

Where Tuareg, and most other Berber varieties have an Aorist, Ghadames has three separate stems: the Imperative, Future, and Aorist. Kossmann (2000) convincingly shows that the Future stem should be reconstructed for Proto-Berber, as in eastern Berber varieties besides Ghadames, namely, Sokni, Foqahi, and Awjili, show traces of an ancient Future stem different from the Aorist in the light verb system. However, due to a lack of data and many innovations, these varieties cannot be used to inform us about the vocalism of Future stem of the heavy verbs. As such, it remains unclear to what extent the system of four types of heavy verbs in Ghadames is ancient, or not. What we can observe is that the two vocalisms reconstructible for the other Berber languages are also present, in some form, in Ghadames. The Type 1 verbs, which have $\Theta\rightarrow$ vocalism for all three stems can be readily equated to the verbs that have an Aorist with $\Theta\rightarrow$ vocalism in other varieties. Types 2, 3, and 4 all have Θ -A $\rightarrow$ vocalism in at least one of the three stems that correspond to the Aorist in other varieties. Therefore, this one likely corresponds to the A $\rightarrow$ class of Tuareg. Nothing more can be said about the reconstructibility of the Future in heavy stems of Ghadames.

To sum up, we find that the Perfective vocalism is always A- Θ -A $\rightarrow$. But the Aorist vocalism consists of two classes. Class 1 can be reconstructed with an Aorist vocalism Θ -A $\rightarrow$, and Class 2 with an Aorist vocalism $\Theta\rightarrow$.

The Imperfective Formation

The Imperfective formation in Berber presents us with several problems. Where the Aorist and Perfective are, generally, regularly derivable from the stem, the Imperfective in a variety of different Berber dialects represent significantly more issues. This much is clear, for example, in Kabyle, where a verb very frequently has a variety of different Imperfective formations (see, e.g., Dallet 1953: 375ff.).⁸

Several Berber dialects have more predictable imperfective formations, most notably Tuareg, Tashlhiyt, and Central Moroccan Berber. While it seems likely that there were other Imperfective formations around,⁹ the pattern found in these languages is most readily reconstructible. The process usually employed by Tuareg,

⁸This is also clear in the appendix at the end of this chapter, where Kabyle often lists a variety of different imperfective formations.

⁹These may have even had slightly different aspectual functions. Tarifit, for example, makes use of a variety of different Imperfective stems, which express subtle differences in semantics (Lafkioui 2018: 98). While Lafkioui, convincingly, makes the case that in its formal application, this is an innovation of Tarifit, the amount of different stems different verbs can have in Kabyle (e.g., *ɛwəl* ‘to falsify,’ Imperfective *idəwəl*, *yətsiṣəwəl*, *yəddəwəl*) suggests that there may have already been some morphological variation which, perhaps, had some semantic specification at an earlier stage of the language already.

However, for quadriconsonantal verbs, the evidence is conflicted. Tuareg, Tashelhiyt, and Central Moroccan Berber generally treat them as a class 1 verbs, whereas Kabyle and Zenatic varieties¹⁰ treat them as class 2 verbs, for example,

- {3} Tuareg *dārḡāl* I *əttadārḡāl* “to be blind”; Tashl. *ddrḡl* I *ttḡrḡāl* “id.”; CMB *ddərḡāl* I *ttḡrḡāl* “id.”;
Kb. *ddərḡāl* I *ttḡrḡāl* “id.”; Fig. *tṭṭərḡāl* I *ttṭṭərḡāl* “id.”

However, there is a fairly large group of common verbs for which the majority of the dialects treat them as Class 1, for example,

- {4} **əqqāymā?* I **əttāyāyma?* “to sit; stand still”
{5} **əffāstā?* I **əttāfāsta?* “to be silent”
{8} **əṛāṛā?* I **əttāṛāṛa?* “to return; vomit”
{10} **əḡḡawān* I **əttāyawan* “to be full; satiated”
{12} **əlalā?* I **əttālala?* “to give birth”

Therefore, it is tempting to see the treatment of Kabyle and Zenatic of verbs like {3} **əddārḡāl*, as Class 2 verbs as innovations, rather than retentions. With the loss of central vowel contrast, which took place in both varieties, the distinction between Class 1 and Class 2 verbs would have gotten blurred, and therefore, it stands to reason that some varieties would have analogically spread the Class 2 imperfective formation to verbs that were originally part of Class 1.

There is one group of quadriconsonantal verbs, however, which have Class 2 vocalism in the imperfective, even in Tashelhiyt and Central Moroccan Berber (but not in Tuareg, where they are Class 1). These are the verbs that have complete reduplication of two root consonants.

- {25} Kb. *ffərḡər* I *tḡərḡir* “to flap the wings”; CMB *fərḡər* I *tḡərḡir* “id.”; Tashl. *ffərḡər* I *tḡərḡir* “id.”
{26} Tu *bārbār* I *əttabārbār* “to go out”; Ouargla *bbərḡər* I *əttbərḡir* “to go up; to travel”
{28} Tu *dāḡdāḡ* I *əttadāḡdag* “to crush”; Kb. *ddəḡḡəḡ* I *ddəḡḡəḡ* “id.”; Ayt Atta CMB *dəḡdəḡ* I *ddəḡḡəḡ* “id.”

The fact that, otherwise rather diverse Berber varieties are in agreement that such verbs are Class 2 verbs – except for Tuareg – makes it likely that Tuareg is innovative in this regard, and that reduplicated verbs belong to the Class 2 verbs, despite their only having three central vowels in the stem, which is a feature that would normally qualify them to belong to the middleweight Class 1 verbs.

A confounding element of this reconstruction, however, is that Figuig shows special treatment of these reduplicating verbs that is different from both Class 1 and Class 2 verbs. Unreduplicated verbs in Figuig have the imperfective *tcəccic*, consistent with Class 2 (e.g., *ddərḡāl* I *dṭṭərḡāl* “to be blind”); But the reduplicated verbs

¹⁰Zenatic languages form a fairly homogeneous subgroup that share several morphological innovations with each other. For a discussion of these features see Kossmann (1999: 31f.; 2017).

are regularly *tcəccəc* (e.g., *ffərɣər* I *tfərɣər* “to flap the wings”) – with no long vowel infixation, whatsoever (Kossmann 1997: 139). This appears to be a behavior unique to Figuig as other Zenatic varieties, such as Ouargli, give such verbs *i*-infixes. At the moment it is unclear how the Figuig data should be integrated into our understanding of the reconstruction of the heavy verb.

Conclusion

In this article we have shown that the heavy verb classes can be reconstructed for Proto-Berber in the form of two distinct apophonic classes. The apophonic class to which any one heavy verb belongs is largely predicted by its stem shape. Class 1 is the class of verbs that contain three central vowels in the stem, and a few lexically determined stems with a plain vowel (see {9–13}).¹¹ Class 2 contains the majority of the verbs with plain vowels, verbs with four central vowels, and a small group of reduplicated verbs with three central vowels. Schematically the vocalizations can be represented as per Table 15.4.

There still remain several verb classes that are clearly reconstructible for Proto-Berber. First, there is a group of verbs with a vocalic prefix in the Aorist, such as Tashl. A *ini* P *nn^a/i* I *ttini* “to say”; Kb. A *izmir* P *uzmar* I *tst̪s̪izmir* “to be able”; Tu. A *uksad^ε* P *āksud^ε* I *ttuksad^ε* “to be afraid,” and second there are the causative verbs derived from, either light or heavy verbs, which form a subtype of the heavy verb class. Besides this, there are the reciprocal derivations with an *m*-prefix, and passive derivations with a *t*-prefix, which seem to have a vocalic pattern that agrees with Class 1 verbs. In Tuareg and Ghadamsi, they simply behave as Class 1 verbs, but in other Berber languages they often receive an *a*-infix in their stem. A full treatment of these forms will have to be discussed another time.

Lexical Data

Throughout this chapter, lexical data from a variety of different Berber dialects have been used. The following table gives the abbreviation used, name of dialect, and reference to the source.

Table 15.4 Proto-Berber apophony

	Aorist = Imperfective	Perfective
Class 1	Θ-A→	A-Θ-A→
Class 2	Θ→	A-Θ-A→

¹¹ While the subset of non-derived verbs with Class 1 vocalism is smaller than those with Class 2, verbs that are in this class, they are generally easier to reconstruct for Proto-Berber than those in Class 2. The Class 1 vocalism is also used for Medio-passives (*m*-derivations) and passives (*t*-derivations) in Tuareg, and traces of this can be found in other Berber languages as well. However, several other formations seem to be common in these derivational patterns that do not easily map onto Class 1 verbs in other Berber languages, such as the Tashl. A *myissin* P *myassan* I *tmyissin* “to know one another” (Boumalk 2003: 128).

Abbreviation	Dialect name	Source
Kb.	Kabyle	Dallet (1982)
CMB	Central Moroccan Berber	Taifi (1992); Oussikoum (2013)
Tashl.	Tashelhiyt	Stroomer (forthcoming)
Ghd.	Ghadames	Lanfry (1973)
Tu. M	Mali Tuareg	Heath (2006)
Tu. U	Tudalt Tuareg (Burkina Faso)	Sudlow (2009)
TU. BF-M	Tamaghit Tuareg (Burkina Faso)	Sudlow (2009)
Tu. W	Iwellemeden Tuareg (Niger)	Prasse et al. (1998)
Tu. Y	Ayer Tuareg (Niger)	Prasse et al. (1998)
Fig.	Figuig	Benamara (2013), and Kossmann (1997)
Zng.	Zenaga	Taine-Cheikh (2008, 2010)
Awj.	Awjila	Van Putten (2014)
Snh.	Senhaja	Ibañez (1959)
Rif.	Tarifit	Serhoual (2002)

Appendix

This appendix gives an overview of reconstructible heavy verbs of the different types. It does not intend to be exhaustive, but it does attempt to give several clear and illustrative examples of the different formations that exist. These examples are numbered, and whenever verb forms are referred to in the article, the corresponding number is given. In several cases, previous works have commented on the reconstruction, or cognates present, of some of these reconstructed words. References to these are given in square brackets after the reconstructed term. The etymologies discussed in Kossmann (1999) are marked by K, followed by the example number from the book. Cognates discussed in Naït-Zerrad (1998–2002) are marked by NZ, followed by the abstracted root as found in that work. The etymological notes of Taine-Cheikh (2008) are marked by TC, followed by the footnote number that discusses the etymology. Finally, if the verb is discussed by Basset (1929) it is marked by B, followed by the conjugation number where it is discussed.

Class 1 (Aor. Θ -A→)

* əcācāc

This group is rather common in Tuareg but is significantly more difficult to detect in other Berber languages. When we do find these verbs, we usually find them as transitive āccāc /intransitive əcācāc pairs, much like Tuareg *ābtas* “to cut,” *ḡātās* “to be cut.” None of the verbs of this type that I have detected in northern Berber have good cognates in Tuareg. While this pattern is not productive in any modern Berber variety, it likely points to an older situation where this derivational pattern was more productive.

{1} *əqqārās “to be torn”

This verb corresponds to the transitive light verb *āyrās “to slaughter; to tear.”

Proto-Berber	Aorist *əqqārās	Perfective *əqqārās	Imperfective *əttāyāras	
Kabyle	qqər ^ʕ s ^ʕ	qqər ^ʕ s ^ʕ	ts̥ts̥əkras	“to be torn”
Figuig	qr ^ʕ əs ^ʕ	qr ^ʕ əs ^ʕ	[qər ^ʕ r ^ʕ əs ^ʕ]	“to be torn; tear”

The Figuig form has been reanalyzed as a regular light verb, but the retention of the *q*, rather than *k* in initial position shows that it was originally derived from a verb with an initial *qq*.

In Kabyle we still find quite a lot of verb pairs of this type, but most of these lack well-attested cognates in other Berber varieties, or, when there are cognates, only show cognates for one of the two forms of the pair. Not all of them have as clear a distinction between transitive and intransitive. Some examples are: *llfəḵ* ~ *lfəḵ* “to be destroyed,” *lləḵs* “to be very wet” ~ *lḵəs* “to be wet.” One should perhaps also compare Kabyle *nnkəl* “to spill; to be spilled” and Tuareg (M) *əḡkəl* “to be poured out.” This is likely an ancient retention of Kabyle, but without more widespread comparative evidence it is difficult to be sure.

{2} *ərrāzā? “to be broken”

This verb corresponds to *ārəzə? “to break.”

Proto-Berber	Aorist *ərrāzā?	Perfective *ārrəzā?	Imperfective *əttārāza?	
Kabyle	r ^ʕ r ^ʕ əz ^ʕ	r ^ʕ r ^ʕ əz ^ʕ	ts̥ts̥ər ^ʕ z ^ʕ a, [ts̥r ^ʕ uz ^ʕ (u(y))]	“to be broken”
Figuig	r ^ʕ r ^ʕ əz	r ^ʕ r ^ʕ əz	[ttr ^ʕ əddza]	“id.”
Ouargla	r ^ʕ r ^ʕ əz ^ʕ	r ^ʕ r ^ʕ əz ^ʕ	yəttər ^ʕ z ^ʕ a, [yət ^ʕ r ^ʕ ər ^ʕ r ^ʕ əz ^ʕ , r ^ʕ r ^ʕ əz ^ʕ]	“id.”

***əḱāccāc**

This stem type has several roots that are readily reconstructible for Proto-Berber with widespread attestations, but the most readily reconstructible forms all end in a final glottal stop.

{3} *əddāryāl “to be blind” [B: 123; NZ: DRYL; TC: 209]

Proto-Berber	Aorist *əddāryāl?	Perfective *əddāryāl?	Imperfective *əttāddāryal?	
Kabyle	ddərəkəl	ddərəkəl	[ddərəkəl, ts̥dərəkəl]	“to be blind”
Tuareg (M)	d ^ʕ ārəkāl	[d ^ʕ ārəkāl-]	ətad ^ʕ ārəkāl	“id.”
CMB	ðər ^ʕ kəl	ðər ^ʕ kəl	[ttðər ^ʕ kəl]	“id.”
Figuig	t ^ʕ t ^ʕ ər ^ʕ kəl	t ^ʕ t ^ʕ ər ^ʕ kəl	[td ^ʕ ər ^ʕ kəl]	“id.”
Ouargla	ddərəkəl	ddərəkəl	[ttddərəkəl]	“id.”
Tashlhiyt	drəkəl	drəkəl	ttddərəkəl	“id.”
Zenaga	əddurkiy	əddurkəy	[əddurkiy]	“to be one-eyed”

The Zenaga form is not cognate, but rather a loan from another Berber language, this is clear because Proto-Berber **ɣ* regularly shifts to *ʔ* in Zenaga, and not to *ɣ* that we see here (Kossmann 2001a: 63–5; Souag 2017).

Most Berber languages have a $\Theta \rightarrow$ vocalism in the Aorist/Imperfect of this verb. As discussed in the section called “The Classification of Middleweight Verbs”, it seems likely that Tuareg and Central Moroccan Berber retain the original vocalism here, although this could certainly be debated.

One is tempted to see this root as some form of compound of an unidentified element *dr*¹², followed by a shortened form of the verb **āqqəl* “to watch” (cf. Fig. *qqəl* “to watch,” CMB *qqəl* “id.,” and probably Tu. *ixal* “to believe”).¹³

{4} **āqqāymāʔ* “to sit; remain” [B: 198; TC: 52]

Proto-Berber	Aorist * <i>āqqāymāʔ</i>	Perfective * <i>āqqəymāʔ</i>	Imperfective * <i>əttāyāymaʔ</i>	
Kabyle	<i>qqim</i>	<i>qqim</i>	[<i>ṭṣṣimi</i> , <i>ṭṣṣim</i> , <i>ṭṣkama</i>]	“to stay; remain”
Tuareg (M)	<i>āqqam</i> , <i>āqqaym</i>	<i>āqqima</i>	<i>ətakāyima</i>	“to sit; be seated”
CMB	<i>qqim</i>	<i>qqima</i>	<i>ttṣima</i>	“to sit; remain”
Figuig	<i>qqim</i> , <i>qqyəm</i>	<i>qqim</i> , <i>qqyəm</i>	<i>ttṣima</i>	“id.”
Ouargla	<i>əqqim</i>	<i>əqqim</i>	<i>əttqima</i>	“id.”
Ghadames (irregular)	Imp. <i>qem</i> < * <i>ṣāymāʔ</i> [Aor. <i>əqqim</i> < * <i>āqqəymāʔ</i>]	<i>āqqim</i>	[<i>əttṣim</i>]	“to remain”
Tashlhiyt	[<i>qqama</i> , <i>ṣama</i> , <i>ṣumu</i> , <i>qumu</i>]	[<i>ṣama</i> , <i>qama</i>]	[<i>ṭṭṣumu</i> , <i>ttqumu</i> , <i>ttqama</i> , <i>ttṣama</i>]	“to sit; remain”
Zenaga	[<i>iʔmi</i>]	<i>aʔma</i>	[<i>ittiʔmi</i>]	“to sit”

The Tashlhiyt forms are certainly cognate to other varieties, but it is difficult to reconcile its form with the one attested in the other varieties examined here, even when compared to Central Moroccan Berber, which in many other ways is linguistically very close to Tashlhiyt. I do not have a clear historical explanation for the presumably innovative development of the Tashlhiyt form.

{5} **əffāstāʔ* “be silent” [NZ: FST1; TC: 314]

Proto-Berber	Aorist * <i>əffāstāʔ</i>	Perfective * <i>əffəstāʔ</i>	Imperfective * <i>əttāfāstaʔ</i>	
CMB	<i>fəsθ</i>	<i>fəsθa</i>	<i>təfsθa</i>	“to be silent”
Tashlhiyt	<i>fəss</i> , [fiss]	<i>fəss</i> , [fiss]	<i>tfəssa</i> , [tfissas]	“id.”

(continued)

¹² I have found some marginal evidence that *dr* may have originally been a kind of pejorative prefix, cf. Kb. *ddərçəl* “to misstep,” Kb. *tiçli* “walk,” Tu. M *akəl* “to step.” Perhaps we can add here, also, Mzab *ddərnəs* “to languish,” Mzab *əns* “to spend the night,” Kb. *ddərβəz* “to fall heavily,” Tu. WY *bāzbāz* “to fall (of fruit or grain)”.

¹³ I thank Maarten Kossmann for suggesting this connection to me.

Proto-Berber	Aorist *əffästā?	Perfective *äffästā?	Imperfective *əttäfästa?	
Ghadames	Imp. <i>fäss</i>	<i>yäffäss</i>	<i>əttäfäss</i>	“id.”
Zenaga	[ufus ^ʕ s ^ʕ i, äffäs ^ʕ s ^ʕ i]	<i>äffus^ʕs^ʕa</i>	[yət ^f us ^ʕ s ^ʕ i]	“id.”

Most Berber varieties have assimilated the final **st* cluster to *ss*, but it seems reasonable to take the Central Moroccan Berber form as original here. The emphatic *s^ʕs^ʕ* in the Zenaga form is not easily explained.

{6} *əggärβā? “to be last” [K: 140; NZ: GRB1, GR45; TC: 357]

Proto-Berber	Aorist *əggärβā?	Perfective *äggärβā?	Imperfective *əttägärβa?	
CMB	<i>ggru</i> <i>ggir, g^wər</i>	<i>ggra</i> <i>ggir, g^wər</i>	[təjru] <i>tgira, tggir, tgg^wər</i>	“to be last”
Tashlhiyt	<i>gg^wru</i>	<i>ggra</i>	[təg ^w ru, ttggru, ttgru]	“to be last”
Kabyle	<i>j^wri</i>	<i>j^wra</i>	[tstsj ^w ray]	
Ghadames	<i>g^ʕərβ</i>	<i>äg^ʕg^ʕərβ(o)</i>	<i>ittäg^ʕərβ</i>	“to be behind”
Zenaga	–	<i>yäggärā</i>	–	“to end up . . .”
Tuareg (M)	[əg ^ʕ g ^ʕ urh]	[əg ^ʕ g ^ʕ urha]	[tig ^ʕ urhu]	“to end up”

The final *u* of Tashlhiyt and some forms of Central Moroccan Berber are perhaps the regular outcome of the sequence **βv̥?* in word-final position, but could also be an analogical spreading of the final *u* that we find in the nominal *m*-derivation *anggaru* “last” < **a-näggärβu?*

Tuareg has a different derivation, with *u* after the first root consonant, and thus belongs to Class 2 verbs.

{7} *əβa/ärgä? “to dream” [K: 320; B: 94]

Proto-Berber	Aorist *əβa/ärgä?	Perfective *äβu/ärgä?	Imperfective *əttäβa/ärga?	
Tuareg (M)	[əhhurg ^ʕ -t]	<i>əhhurg^ʕ-t</i>	[tiħərg ^ʕ -t]	“to dream”
Tuareg (BF-U)	[əhhärg ^ʕ -t]	<i>əhhərg^ʕ-t</i>	[ti-ħärg ^ʕ -t]	“id.”
CMB	<i>warja</i>	<i>warja</i>	<i>ttwarja</i>	“id.”
Tashlhiyt	<i>wwarg</i>	<i>wwarg</i>	<i>ttwarga</i>	“id.”
Kabyle	<i>arju</i>	<i>urja</i>	<i>tstsarju</i>	“id.”
Ghadames	<i>əββärg^ʕ</i>	<i>yäββərg^ʕ</i>	<i>əttäβərg^ʕ</i>	“id.”
Awjila	[uf tavərgát]	?	<i>vərga</i>	“id.”
Tarifit	<i>arza</i>	<i>urza</i>	<i>tarzi, tarza</i>	“id.”
Figuig	<i>rzit</i>	<i>rzit</i>	<i>ttiḡrit</i>	“id.”

As with the previous verb, Mali Tuareg has shifted this verb to another class, with *u* after the first root consonant, thus becoming a class 2 verb. The exact origin of the -*t* suffix of Tuareg is not yet fully understood, but often occurs on vowel-final/glottal stop-final verbs.

Central Moroccan Berber and Tashlhiyt – and perhaps Kabyle – point to a stem with **a* in the root **əβārgǎʔ*. The Mali Tuareg form could originally be from the same form. As Class 1 and Class 2 merge in the perfect, it is easy to imagine that a verb like this could shift class by analogy from the perfect. The Tudalt Tuareg form, however points to **əβārgǎʔ*, which likewise seems to be the basis for the Figuig form, which, moreover, has a final **t* that seems to correspond to the Tuareg forms with final *-t*, rather than a final **ʔ*. Awjili and Ghadames seem to point to a short vowel in the stem as well. These disparate forms are not easily reconciled.

{8} **ərǎʔrǎʔ* “to return; vomit” [TC: 787]

Proto-Berber	Aorist <i>*ərǎʔrǎʔ</i>	Perfective <i>*ǎrǎʔrǎʔ</i>	Imperfective <i>*əttǎrǎʔraʔ</i>	
CMB	<i>rar</i>	<i>rura, rur</i>	<i>ttrara</i>	“to return; vomit”
Tashlhiyt	<i>rar</i>	<i>rur</i>	<i>ttrara</i>	“id.”
Kabyle	<i>ərr</i>	<i>ərɾa</i>	<i>[tst̪sarra]</i>	“id.”
Ghadames	<i>ǎrr</i>	<i>ǎrro</i>	<i>ttǎrr</i>	“id.”
Figuig	<i>rr</i>	<i>ərru</i>	<i>tərɾa</i>	“id.”
Ouargla	<i>ərr</i>	<i>ərru</i>	<i>əttərɾa</i>	“id.”
Zenaga	<i>[uruʔri]</i>	<i>ǎruʔrǎ</i>	<i>[ətruʔri]</i>	“id.”

This reduplicated verb does not seem to have the initial gemination found in other verbs of this type. This is perhaps to be related to the general avoidance of gemination of certain “weak,” and highly sonorous, consonants such as **w*, **y*, **β* as described by Kossmann (2008: 283ff.), and **r*, **l*, **m*, **n* as seen in imperfective formations of light verbs in Tashlhiyt and Ghomara, which have *ɛrs* “to slaughter” Impf. *qqrs*, rather than the more generally attested *ɛrrəs* (Dell and Elmedlaoui 1991: 85f.; Mourigh 2016: 143f.). Whatever the explanation, the seemingly likewise (partially) reduplicated verb {11} *əlalǎʔ* “to give birth” also lacks the gemination. Ghadames, Zenatic, and Kabyle lack the full vowel *a/u* in the root that we see in Central Moroccan Berber and Tashlhiyt. This is presumably because of the sequence **əʔ* lost completely in these varieties (and **ǎʔ* when unaccented) (Kossmann 2001a: 91f.). The regular outcome of the verb, e.g., in Kabyle, would therefore have presumably been A **rar* P **ərɾa* I **tst̪srara*. The predicted apophony has been analogically leveled out in all of these varieties.

{9} **əGGǎʔfǎy* “to go up” [NZ: GFY; TC: 331]

Proto-Berber	Aorist <i>*əGGǎʔfǎy</i>	Perfective <i>*ǎGGǎʔfǎy</i>	Imperfective <i>*əttǎGGǎʔfay</i>	
CMB	<i>ggafy</i>	<i>ggufy</i>	<i>tjafay</i>	“to go up”
Zenaga	–	<i>äggufǎh (-a:n)</i>	–	“to head north”

This etymology was suggested already by Taine-Cheikh (2008: 174, note 331) and Kossmann (2018: 181). The last of these seems quite uncertain about the etymology, but the formal match seems fine. Considering the context of where

Zenaga is situated, and was situated, in past centuries, south of the Atlas mountains, it strikes me as quite probable that, indeed, these two words are cognates.

*əcacăc

{10} *əyyawăn (or *əyyăḏwăn) “to be full, satiated” [K707, 711; B: 193; NZ: GWN1]

Proto-Berber	Aorist *əyyawăn	Perfective *əyyiwăn	Imperfective *əttăyawan	
Figuig	dʒawən	dʒiwən	tyawan, dʒawan	“to be satiated”
Ouargla	ʒʒawən	əʒʒiwən	əttʒawan	“id.”
Tarifit	ʒʒawən	ʒʒiwən	tyawan	“id.”
Tuareg (M)	əyyăwăn	əyyəwăn	ətayăwan	“id.”
Tashlhiyt	ʒʒawn, ʒʒiwn	[ʒʒawn]	ttʒʒawan, ttʒiwin	“id.”
CMB	ḏʒḏʒawn	ḏʒḏʒiwn	tyawan	“id.”
Ghadames	(əg'g'iwăn) Fut. əg'g'ewăn ¹⁴	(əg'g'ewăn)	əttāg'ewăn	“id.”
Awjili	iwən		[ttiwān]	“id.”

Tuareg has a central vowel as its second vowel, and, therefore, behaves just like verbs of the type {1} *əqqrăś “to be ripped.” This same reflex is found in the next verb of the same structure {10} *əGGawăr “to sit.” There is no clear explanation for this distribution, and other verbs in similar environments retain the *a*, e.g., *hawăl* “to speak; rant,” while others seem to vascillate between dialects in terms of their treatment of this sequence, e.g., BF-M *kawăn* “to answer,” but BF-U *kăwăn* “id.” In Ayer Tuareg and the closely related Tudalt dialect of Burkina Faso the *cacăc* class has disappeared completely and thus their treatment of such verbs in this way is to be expected (Sudlow 2001: 206; Prasse et al. 1998: 452).

Kossmann (1999: 232f.) argues convincingly that the alternation between initial *ḏʒḏʒ/ʒʒ* in the Aorist and Perfective and *tt-y* in the imperfective in several of the varieties discussed here is best explained as *ḏʒḏʒ* being the outcome of geminate *yy, as verbs of this type would regularly geminate the initial in the Aorist and Perfective stem. It appears that Awjili and Tuareg have a different outcome of *yy than the other Berber varieties.

{11} *əGGawăr (or *əGGăḏwăr) “to sit” [NZ: GWR1]

Like the previous word, this word has a central vowel in Tuareg. As there are no dialects that distinguish *g from *ġ that retain this root, it is reconstructed here with an undefined voiced velar *G.

¹⁴ One wonders if this form the result of mid-vowel harmony, as discussed in the noun by Van Putten (2018), reflecting *əġġawăn. There is, however, no clear explanation as to why this development would apply here and not to other verbs.

Proto-Berber	Aorist *əGGawār	Perfective *əGGiwār	Imperfective *əttāGawar	
Tuareg (WY)	ǎggǎwār	ǎggəwār	əttǎǎgāwar	“to sit down”
Tashlhiyt	ggawr, [ggiwr]	[ggawr], ggiwr	ttgawar	“id.”
CMB	[jiwr]	jiwr	[tjiwir]	“id.”

{12} *əlalā? “to give birth” [TC: 1074]

Proto-Berber	Aorist *əlalā?	Perfective *ālulā?	Imperfective *əttālala?	
CMB	lal	lula	ttlala	“to give birth”
Tashlhiyt	lal	lul, lula	ttlala	“to be born”
Kabyle	lal	lul	ṭslala, [ṭslal]	“id.”
Ouargla	llal	llul	ttlala	“id.”
Ghadames		yālul “he is born”		“id.”
Zenaga	[iyiyi]	äyivä	əttiyyi	“id.”

In most varieties this verb lacks the initial gemination, see {8} *ərā?rā? “to give back; vomit,” for a discussion.

*əcācāc

{13} *əǧǧallā? “to swear” [K: 440; B: 165; NZ: GL23]

Proto-Berber	Aorist *əǧǧallā?	Perfective *əǧǧullā?	Imperfective *əttǧǧalla?	
CMB	ggall	ggula	ttjalla	“to swear”
Tashlhiyt	ggall	ggull, ggulla	ttgalla	“id.”
Kabyle	ggall	ggull	ṭsjalla	“id.”
Figuig	dʒall	dʒull	dʒalla < *tʒalla	“id.”
Ouargla	ʒʒall	ʒʒull	ttʒalla	“id.”
Tarifit	ʒʒadʒ	ʒʒudʒ	tʒadʒa	“id.”

{14} *əǧǧaggā? “to break up camp” [K: 446; B: 166; NZ: G26]

Proto-Berber	Aorist *əǧǧaggā?	Perfective *əǧǧuggā?	Imperfective *əttǧǧagga?	
CMB	ggadʒdʒ	[ggadʒdʒ]	tjadʒdʒa	“to decamp”
Kabyle	ggadʒ	ggudʒ	ṭsjadʒ	“id.”
Tuareg (M)	ǎǧǧagǧǧ	ǎǧǧugǧa	tagǧagǧa	“to load”

This root underwent a typical dissimilation of two subsequent velars where the latter turned into a $\bar{d}ʒ$, or $ʒ$, in Central Moroccan Berber and Kabyle. This is the outcome of the sound law *g/y...*g>*g/y...*ʒ as described by Kossmann (1999: 228), cf. also {16} *əǧǧuǧal “to be an orphan”.

{15} *əzzallā?* “to pray” [B: 165]**

Proto-Berber	Aorist <i>*əzzallā?</i>	Perfective <i>*əzzullā?</i>	Imperfective <i>*əttāzalla?</i>	
CMB	<i>zʷalʷ</i>	<i>zʷulʷa</i>	<i>dzʷalʷa</i>	“to pray”
Tashlhiyt	<i>zʷall</i>	<i>zʷull, zʷulla</i>	<i>tzʷalla</i>	“id.”
Kabyle	<i>zʷall</i>	<i>zʷull</i>	<i>ṭszʷalla, dʷzʷalla</i>	“id.”
Figuig	<i>zʷall</i>	<i>zʷull</i>	<i>tzʷalla</i>	“id.”
Ouargla	<i>zʷall</i>	<i>zʷull</i>	<i>ttzʷalla</i>	“id.”
Zenaga	<i>yusʷsʷulli, yasʷsʷalli</i>	<i>yasʷsʷəllā</i>	<i>yətsʷallā</i>	“id.”

This verb certainly is a very early loanword from Arabic *sʷallā* “to pray” (Kossmann 2013b: 82) and so cannot be reconstructed for Proto-Berber. It is, however, the only verb of this type besides {13} **əggallā?* “to swear,” well-attested across all Berber languages. Van den Boogert and Kossmann (1997: 318) suggest that this loanword was probably adapted into the class by analogy with {13} **əggallā?* “to swear.” It is given here because it is a good illustration of this verb type in Zenaga, which lacks a cognate of {13} **əggallā?* “to swear.” However, the Zenaga verb has *sʷsʷ* in place of *zʷzʷ*. This is not the regular outcome of Proto-Berber **zz*, which normally yields *zʷzʷ* while simplex **z* yields *θʷ*, e.g., P *yarʷθʷa* I *yirʷazʷzʷa* “to break” (Taine-Cheikh 1999: 317; 2008: 453 f.). The reflex found here is presumably due to the influence of the Arabic verb *sʷallā*, from which it ultimately derives.

Class 2 (Aor. $\Theta \rightarrow$)

Verbs of this type generally have a lexical vowel **u* as their second stem vowel. Those that do not usually have four central vowels.

****əcucəc***

While this type is fairly well-attested, there are rather few reconstructible verbs in this type. Nevertheless, the actual formation is uncontroversial, forming A **əcucəc* P **əcucəc* I **əttəcucuc*.

{16} **əggugəl* “be an orphan” [K: 694; B: 95; NZ: GL22]

Proto-Berber	Aorist <i>*əggugəl</i>	Perfective <i>*əggugəl</i>	Imperfective <i>*əttəgugul</i>	
Tuareg (WY)	<i>əggugəl</i>	<i>əggugəl</i>	<i>əttəgugul</i>	“to be an orphan”
Kabyle	<i>gguzəl</i>	<i>gguzəl</i>	<i>ṭsjuzəl</i>	“id.”
Ouargla	<i>gguzəl</i>	<i>gguzəl</i>	<i>ttguzul</i>	“id.”

A dissimilatory sound law **g/γ...g > *g/γ...ž* (Kossmann 1999: 228) has affected a variety of different dialects, and it cuts right across the Tuareg dialect continuum, where some dialects have not undergone this dissimilation, while others have.

{17} **əffudəy* “be injured” [B: 93; NZ: FDY]

Proto-Berber	Aorist * <i>əffudəy</i>	Perfective * <i>əffidäy</i>	Imperfective * <i>əttəfuduy</i>	
Tuareg (M)	[<i>əffadäy</i>]	<i>əffidäy</i>	[<i>tafaday</i>]	“to have cuts on skin”
Tuareg (WY)	<i>əffudi</i>	<i>əffodäy</i>	<i>əttəfuduy</i>	“to have a sore on the back”
Kabyle	<i>ffuði</i>	<i>ffuði</i>	[<i>tfuði</i>]	“to be injured”
Tashlhiyt	<i>fudi</i>	<i>fudi</i>		“id.”
CMB	<i>ffiðy</i>	<i>ffiðy</i>	<i>ttfiðiy</i>	“id.”

In Mali Tuareg, this verb is a Class 1 verbs *fadäy*, perhaps the result of a reclassification due to Class 1 and Class 2 verbs of this type looking identical in the perfective. Central Moroccan Berber has a *i* vowel in the root, which does not have a clear explanation.

**əcuccəc*{18} **əBBunzər* “have a nosebleed” [B: 168; NZ: BNZR; TC: 559]

Proto-Berber	Aorist * <i>əBBunzər</i>	Perfective * <i>əBBunzār</i>	Imperfective * <i>əttəBunzur</i>	
Tuareg (M)	<i>əhhunfər</i>	<i>əhhunfār</i>	<i>ətiħənfur</i>	“have a nose bleed”
CMB	<i>junzər</i>	<i>junzər</i>	<i>tjunzur</i>	“id.”
Tashlhiyt	<i>ggunzr</i> (b-, m-, w-)	<i>ggunzr</i>	<i>ttggunzur</i>	“id.”
Figuig	<i>ppunzər</i>	<i>ppunzər</i>	<i>tbunzur</i>	“id.”
Ouargla	<i>mmunzər</i>	<i>mmunzər</i>	<i>ttmunzur</i>	“id.”
Kabyle	<i>ffunzər</i>	<i>ffunzər</i>	<i>tsfunzur</i>	“id.”
Zenaga	<i>uːnzər</i>	<i>əwnzər</i>	<i>əttuːnzər</i>	“Id.”
Ghadames	<i>əffənzər</i>	<i>əffənzār</i>	<i>əttəfənzər</i>	“id.”

The most well-attested verb in this class is “to have a nosebleed,” which has a rather astounding amount of variation of its initial consonant, which appears to reflect any possible initial labial consonant across the different Berber languages (denoted as a **B* here), assuming here that the *g/gg* reflexes of CMB and Tashlhiyt are the result of geminated **ww* > **gg*^w. Despite this difficulty, the verb is one of the best attested forms of **əcuccəc* verbs and is, therefore, included here.

**əcūcəc*{19} **əddukkəl* “to walk together, accompany” [NZ: DKL5]

Proto-Berber	Aorist * <i>əddukkəl</i>	Perfective * <i>əddukkāl</i>	Imperfective * <i>əttədukkul</i>	
Tuareg (B-M)	<i>əddukkəl</i>	<i>ədokkāl</i>	<i>ətidukkul</i>	“gather together”
Tashlhiyt	<i>ddukkəl</i>	<i>ddukkəl</i>	<i>ttdukkul</i>	“walk together; accompany”
CMB	<i>ddukk^wəl</i>	<i>ddukk^wəl</i>	<i>ttəddukk^wul</i>	“be friendly with”
Kabyle	<i>ddukəl</i>	<i>ddukəl</i>	[<i>tsdukəl</i>]	“walk together”

əCəCUCəC*{20} əkəɾur(r)əy “to be round” [K: 750]**

Proto-Berber	Aorist <i>*əkəɾurəy</i>	Perfective <i>*ākərarāy</i>	Imperfective <i>*əttəkəɾuruy</i>	
Tuareg	<i>əkəɾurəy</i>	<i>[ākɾarāy]</i>	<i>tikruruy</i>	“to be spherical”
Tashlhiyt	<i>krurri</i>	<i>krurri</i>	<i>[ttkrurri, ttkrurray]</i>	“to be round”

While this verb type is well-attested, both in varieties that have lost the short vowel distinctions, and those that have kept it, this verb is one of the few verbs of this type that is attested in both types of Berber languages, and can probably be reconstructed for Proto-Berber. Note, that there is a difference in length of the third root consonant *r* between Tuareg and Tashlhiyt.

{21} *əkənnunəy “to roll, tumble” [K: 750; B: 108]

Proto-Berber	Aorist <i>*əkənnunəy</i>	Perfective <i>*ākənnannāy</i>	Imperfective <i>*əttəkənnunuy</i>	
Ghadames	<i>gnunni</i>	<i>[āgənnune]</i>	<i>əttəgnunni</i>	“to tumble”
Tashlhiyt	<i>gnunni</i>	<i>[gnunni]</i>	<i>ttgnunnuy</i>	“to roll; tumble”
CMB	<i>çnunnəy</i>	<i>[çnunnəy]</i>	<i>ttəçnunnuy</i>	“to roll; tumble”
Mzab	<i>gnunni</i>	<i>[gnunni]</i>	<i>ttəgnunnuy</i>	“to roll on the ground”
Senhaja	<i>qnunni</i>	<i>[qnunni]</i>	<i>[ttəqnunni]</i>	“to roll”
Figuig	<i>qnunəy</i>	<i>[qnunəy]</i>	<i>ttəqnunuy</i>	“to roll”
Tarifit	<i>qnunni</i>	<i>[qnunni]</i>	<i>ttəqnunnuy</i>	“to tumble”

This semantically closely related verb is another verb that can be reconstructed for Proto-Berber. A variety of languages have expressive formations using the non-Proto-Berber phoneme *q* (Kossmann 2013b: 199ff.). While most varieties have a *g* as the first root consonant, there is no obvious explanation for the *k* in Central Moroccan Berber; whereas the *g* can be easily explained as the result of voicing assimilation, as such a reconstruction **əkənnunəy* is to be preferred over **əgənnunəy*.

{22} *əfəɾurəy “to drop fruits or grain (said of trees)” [B: 104; NZ: FRY1]

Proto-Berber	Aorist <i>*əfəɾurəy</i>	Perfective <i>*āfərarāy</i>	Imperfective <i>*əttəfəɾuruy</i>	
CMB	<i>frury</i>	<i>[frury]</i>	<i>tfruruy</i>	“drop fruits”
Tashlhiyt	<i>fruri</i>	<i>[fruri]</i>	<i>ttfruruy</i>	“id.”
Kabyle	<i>fruri</i>	<i>[fruri]</i>	<i>tstṣfruruy, [tstṣfruri]</i>	“id.”
Ouargla	<i>fruri</i>	<i>[fruri]</i>	<i>ttfruruy</i>	“to fall apart; decay”

{23} **əɣəlɣəl* “to be indecisive” [B 105; NZ: GL19]

Proto-Berber	Aorist <i>*əɣəlɣəl</i>	Perfective <i>*ǎɣəlaɣəl</i>	Imperfective <i>*əttəɣəlɣəl</i>	
Tuareg	<i>ɣəlɣəl</i>	<i>əɣlaɣəl</i>	<i>tɪɣlɣul</i>	“to be indecisive”
Ida U Semlal ¹⁵	<i>ɣlɣl</i>	<i>[ɣlɣl]</i>	<i>ttɣlɣul</i>	“to stagnate”

***əCəCucu**{24} **əɣəlulu* “to be hung”

Proto-Berber	Aorist <i>*əɣəlulu</i>	Perfective <i>*ǎɣələla</i>	Imperfective <i>*əttəɣəlulu</i>	
Ghadames	<i>əɣʷlulu</i>	<i>[ǎɣʷələla]</i>	<i>əttəɣʷlulu</i>	“to be hung”
Figuig	<i>ɣlulu</i>	<i>[ɣlulu]</i>	<i>ttəɣlulu</i>	“to be hung”

This verb is likely connected to the light verb **aɣəl* “to hang (s.th.)” (cf. Figuig *ayəl* “id.,” CMB *aɣəl* “id.,” Zng. P *yugäy*), but to my knowledge there are no other transitive/intransitive pairs that correspond to $ac^1əc^2$ and $əc^1əc^2uc^2u$ verb types. It is, therefore, difficult to decide how their derivational relationship should be understood.

***əC₁əC₂C₁əC₂**

It is quite difficult to find clear cognates across dialects that retain central vowel contrast and those that do not. However, it is clear that a marginally productive pattern of expressive reduplicative verbs exists and is productive across the different Berber varieties. And when these occur, they clearly have a $\Theta \rightarrow$ pattern in the **Aorist**, accompanied by an *i* vowel in the imperfective, as expected.

{25} **əffərɣər* “to flap the wings” [B: 172; NZ: FR1]

Proto-Berber	Aorist <i>*əffərɣər</i>	Perfective <i>*ǎffərɣār</i>	Imperfective <i>*əttəfərɣir</i>	
Ghadames	<i>əffərɣər</i>	<i>ǎffərɣār</i>	<i>əttəfərɣər</i>	“to flap the wings”
Kabyle	<i>ffərɣər</i>	<i>ffərɣər</i>	<i>tɪfərɣir</i>	“id.”
Central Moroccan Berber	<i>fərɣər</i>	<i>fərɣər</i>	<i>tɣərɣir</i>	“id.”
Tashlhiyt	<i>ffirɣir</i>	<i>ffirɣir</i>	<i>ttfirɣir</i> , <i>[ttfirɣar]</i>	“id.”
Figuig	<i>ffərɣər</i>	<i>ffərɣər</i>	<i>[tɣərɣər]</i>	“id.”
Ouargla	<i>ffərɣər</i>	<i>ffərɣər</i>	<i>ttfərɣir</i>	“to fly around”

¹⁵ Basset (1929: 91), Boumalk (2003: 65, 172).

{26} **abb̥ar̥b̥ar* “to go out, travel” [NZ: BR2]

Proto-Berber	Aorist <i>*abb̥ar̥b̥ar</i>	Perfective <i>*ābb̥ar̥b̥ār</i>	Imperfective <i>*att̥ab̥ar̥bir</i>	
Tuareg (BF-M)	<i>ābb̥ār̥b̥ār</i>	<i>ābb̥ar̥b̥ār</i>	<i>att̥ab̥ār̥bar</i>	“to go out; leave”
Ouargla	<i>bb̥ar̥b̥ar</i>	<i>bb̥ar̥b̥ar</i>	<i>tt̥ab̥ar̥bir</i>	“to go up; travel”
Siwi	<i>bb̥ar̥baṛ</i>	<i>bb̥ar̥baṛ</i>	<i>[b̥ar̥baṛ]</i>	“to gush out”

Cases of Proto-Berber **b* are extremely rare, which is cause for Maarten Kossmann¹⁶ to doubt its reconstructibility. I agree with this assessment and, therefore, this verb and {27} **abb̥az̥b̥az̥* should not be uncritically accepted as reconstructible for Proto-Berber. However, both of these verbs are reduplicate and clearly expressive, onomatopoeic words. Onomatopoeia tends to allow for a broader range of phonemes than regular words (Dingemanse 2012), e.g., Japanese has a phoneme *p* in onomatopoeia and ideophones, while it is an allophone of *h* in native Japanese and Sino-Japanese words (McCawley 1968:77–80). Therefore, it can be imagined that verbs like these are indeed reconstructible with **b* despite the otherwise rarity of this phoneme.

{27} **abb̥az̥b̥az̥* “to shake, shiver”

Proto-Berber	Aorist <i>*abb̥az̥b̥az̥</i>	Perfective <i>*ābb̥az̥b̥āz̥</i>	Imperfective <i>*att̥ab̥az̥biz̥</i>	
Tuareg (M)	<i>ābb̥āḥ̣b̥āḥ̣</i>	<i>ābb̥aḥ̣b̥āḥ̣</i>	<i>att̥ab̥āḥ̣b̥aḥ̣</i>	“to shake; knock”
CMB (Ayt Atta)	<i>bb̥az̥β̣az̥</i>	<i>bb̥az̥β̣az̥</i>	<i>tt̥abb̥az̥β̣iz̥</i>	“to tingle”

The reconstruction of Proto-Berber **b* poses some problems (see {26} **abb̥ar̥b̥ar*, for a discussion).

{28} **add̥agd̥ag* “to shatter/to be shattered” [NZ: DG19]

Proto-Berber	Aorist <i>*add̥agd̥ag</i>	Perfective <i>*ādd̥agd̥āḥ</i>	Imperfective <i>*att̥add̥agd̥ig</i>	
Tuareg (M)	<i>[ādd̥āgd̥āg]</i>	<i>ādd̥agd̥āg</i>	<i>[att̥ādd̥āgd̥ag]</i>	“to shatter”
CMB	<i>dd̥aj̥ọ̄aj̥</i>	<i>dd̥aj̥ọ̄aj̥</i>	<i>tt̥ọ̄aj̥ọ̄ij̥</i>	“id.”
Kabyle	<i>dd̥aj̥ọ̄aj̥</i>	<i>dd̥aj̥ọ̄aj̥</i>	<i>add̥aj̥ọ̄ij̥</i> (< <i>*tt̥d̥agd̥ig</i>)	“id.”
Tashlhiyt	<i>d̥gd̥g</i>			“to be tired”
Ouargla	<i>dd̥agd̥ag</i>	<i>dd̥agd̥ag</i>	<i>tt̥d̥agd̥ig</i>	“to shatter”

The semantics of the Tashlhiyt verb are quite far removed from the rest but may be compared to the English expression “to be shattered” in the meaning of “to be

¹⁶Personal communication. Kossmann (1999: 128–130) suggests that several words appear to point to Proto-Berber **b*, but these are quite rare.

very tired” and Dutch “kapot zijn” (= to be broken) – in the meaning of “to be very tired.”

This verb is widely attested in North-African Arabic, e.g., Moroccan *dəgdəg* “to shatter into tiny pieces,” *mdəgdəg* “shattered; very tired” (de Prémare et al. 1993–1999: IV, 302), Tunisian *mdəgdig* “broken; shattered”.¹⁷ It is difficult to decide the direction of borrowing, or whether this is a case of parallel development of an onomatopoeic word.

{29} **attəftəf* “to grope around”

Proto-Berber	Aorist <i>*attəftəf</i>	Perfective <i>*āttəftāf</i>	Imperfective <i>*attəftəfif</i>	
CMB	<i>ðəfðəf</i>	<i>ðəfðəf</i>	<i>ðəðif</i>	“to grope around”
Kabyle	<i>ttəfðəf</i>	<i>ttəfðəf</i>	<i>ttəfðif</i>	“id.”
Ouargla	<i>ttəftəf</i>	<i>ttəftəf</i>	<i>ttəftif</i>	“id.”

**əcəcicəc*

{30} **əgəriwəl* “to turn” [B: 96; NZ: GRWL]

Proto-Berber	Aorist <i>*əgəriwəl</i>	Perfective <i>*āgərawāl</i>	Imperfective <i>*əttəgəriwil</i>	
Tuareg	<i>əgriwəl</i>	<i>āg'rawāl</i>	<i>əttigriwil</i>	“to turn around”
Tashlhiyt (Ntifa) ¹⁸	<i>griwl</i> , [<i>grawl</i>]	<i>grawl</i>	<i>ttgriwil</i>	“id.”

Already at the Proto-Berber stage **uw* had dissimilated to *iw* (Prasse 1973: 93), therefore this verb and {31} **əfəriwəs* may have originally belonged to the **əcəcicəc* verbs, discussed above.

{31} **əfəriwəs* “jump (with joy?)” [FRWS1,2]

Proto-Berber	Aorist <i>*əfəriwəs</i>	Perfective <i>*āfərawās</i>	Imperfective <i>*əttəfəriwis</i>	
Tuareg	<i>əfriwəs</i>	<i>āfrawās</i>	<i>ətifriwis</i>	“to be joyful”
Kabyle	<i>friwəs</i>	<i>frawəs</i>	<i>īṣṣəfriwis</i>	“to jump up”

The semantic connection of the Kabyle verb “to jump up” and Tuareg “to be joyful” is not perfect but seem close enough for them to be cognates. In any case, the formal similarity is perfect, allowing us to examine the formation of a **əcəcicəc* verb.

¹⁷ From the TUNICO dictionary (<https://vicav.acdh.oeaw.ac.at/>) (consulted 8 january 2020).

¹⁸ Basset (1929: 86, 220).

{32} **arə́ǵiǵaʔ* “to tremble” [K: 323; B: 97]

Proto-Berber	Aorist <i>*arə́ǵiǵaʔ</i>	Perfective <i>*ä́rə́ǵaǵaʔ</i>	Imperfective <i>*attə́rə́ǵiǵiʔ</i>	
Tuareg	<i>arǵiǵi</i>	<i>arǵlagla</i>	<i>ttirǵiǵi</i>	“to tremble”
Figuig	<i>rʒiʒ</i>	<i>[rʒiʒ]</i>	<i>ttərʒiʒi</i>	“id.”
Ouargla	<i>rʒiʒi</i>	<i>[rʒiʒi]</i>	<i>ttərʒiʒi</i>	“id.”
Zenaga	<i>arǵagi</i>	<i>ärgägä</i>	<i>ttərǵagi</i>	“id.”
Awjila	<i>arǵig</i>		<i>[tərǵiga]</i>	“id.”
Kabyle	<i>rjiji</i>	<i>rjaji</i>	<i>ts̥ts̥ərjiji</i>	“id.”
CMB	<i>rjiji</i> <i>rjiggi</i>	<i>[rjiji]</i> <i>rjigga</i>	<i>ttərjiji</i> <i>ttərjiggi</i>	“id.”
Tashlhiyt	<i>rgigi</i>	<i>rgagi</i>	<i>ttrgigi</i> <i>ttrgigiγ</i>	“id.”

Kabyle, Central Moroccan Berber and Tashelhiyt have reinterpreted this verb as having a final root consonant **γ*: **arə́ǵiǵay*, as is also evidenced by the verbal noun Kb. *θarjajayθ*, Tashl. *targigayt* (but CMB *targagit*). The A→ vocalism attested in Zenaga suggests that perhaps Zenaga underwent a syncope of the initial open syllable, similar to many Tuareg dialects with verbs of this type (e.g., Tu. *kəniḥar* but P *āknaḥr* < **ākənaḥr* “be disgusting”). The Figuig and Awjili reflexes rather support a reconstruction with **vʔ*, as final **i* or **ay* would be expected to yield *i* or *ay*.

{33} **əməliləʔ* “to meet one another”

Proto-Berber	Aorist <i>*əməliləʔ</i>	Perfective <i>*ämə́laləʔ</i>	Imperfective <i>*əttəməliliʔ</i>	
Kabyle	<i>mlil</i>	<i>mlal</i>	<i>ts̥ts̥əmlili</i> , <i>[ts̥ts̥əmlil]</i>	“to meet”
CMB (Ayt Atta)	<i>lmili</i>	<i>lmala</i>	<i>ttəlmili</i>	“to be close by”

The Ayt Atta form is likely a metathesis of this root, rather than the Kabyle form, as **əC₁əC₂ic₂əʔ* reduplication seems common in verbs of this shape (see also {32} above).

Bibliography

- Basset A (1929) La langue berbère. Morphologie, le verbe, étude de thèmes. Librairie Ernest Leroux, Paris
- Benamara H (2013) Dictionnaire amazighe – français: parler de Figuig et ses régions. Institut royal de la culture amazighe, Rabat
- Boumalk A (2003) Manuel de conjugaison du tachelhit. L'Harmattan, Paris
- Cohen D, Taine-Cheikh C (2000) À propos du zénaga. Vocalisme et morphologie verbale en berbère. Bulletin de la Société de Linguistique de Paris 95:267–319
- Dallet J-M (1953) Le Verbe Kabyle. Fichier de Documentation Berbère, Fort National
- Dallet J-M (1982) Dictionnaire kabyle-français. parler des At Mangellat, Algérie. SELAF, Paris
- de Foucauld C (1950) Dictionnaire touareg-français (dialecte de l'Ahaggar). Imprimerie Nationale de France, Paris

- de Prémare A-L, Colin GS, Brunot L, Marçais W (1993–1999) Dictionnaire Arabe-Français. Établi Sur La Base de Fichiers, Ouvrages, Enquêtes, Manuscrits Études et Documents Divers Par A.-L. de Prémare. 12 vols. L'Harmattan, Paris.
- Dell F, Elmedlaoui M (1991) Clitic Ordering, Morphology and Phonology in the Verbal Complex of Imdlawn Tashlhiyt Berber. Part II. Langues orientales anciennes philologie et linguistique. Peeters, Louvain and Paris
- Dingemanse M (2012) Advances in the cross-linguistic study of ideophones. *Lang Linguist Compass* 6(10):654–672
- Heath J (2005) A grammar of Tamashek (Tuareg of Mali). Mouton de Gruyter, Berlin
- Heath J (2006) Dictionnaire touareg du Mali. tamachek-anglais-français. Karthala, Paris
- Ibañez E (1959) Diccionario Español-Senhayi (Dialecto Bereber de Senhaya de Serair). Instiuto de Estudios Africanos, Madrid
- Kossmann MG (1997) Grammaire du parler berbère de figuig. Peeters, Paris/Louvain
- Kossmann MG (1999) Essai sur la phonologie du proto-berbère. Rüdiger Köppe Verlag, Köln
- Kossmann MG (2000) La futur à Ghadamès et l'origine de la conjugaison verbale en berbère. In: Chaker S, Zaborski A (eds) Études Berbères et chamito-sémitiques. mélanges offerts à Karl-G. Prasse. Peeters, Paris/Louvain, pp 237–255
- Kossmann MG (2001a) The origin of the glottal stop in Zenaga and its reflexes in the other Berber languages. *Afrika und Übersee* 84:61–100
- Kossmann MG (2001b) L'origine du vocalisme en zénaga de Mauritanie. *Frankfurter Afrikanistische Blätter* 13:83–95
- Kossmann MG (2008) Three irregular berber verbs: 'eat', 'drink', 'be cooked, ripen. In: Lubotsky A, Schaeken J, Wiedenhot J (eds) Evidence and counter-evidence, Festschrift Frederik Kortlandt. Rodopi, New York, pp 225–236
- Kossmann MG (2011) A grammar of Ayer Tuareg (Niger). Rüdiger Köppe Verlag, Köln
- Kossmann MG (2012) Berber. In: Frajzyngier Z, Shay E (eds) The Afroasiatic languages. Cambridge University Press, Cambridge, pp 18–101
- Kossmann MG (2013a) A grammatical sketch of Ghadames Berber (Libya), *Berber studies* 40. Rüdiger Köppe, Köln
- Kossmann MG (2013b) The Arabic influence on northern Berber. Brill, Leiden/Boston
- Kossmann MG (2017) La Place Du Parler Des Senhaja de Sraïr Dans La Dialectologie Berbère. In: Vicente Á, Caubet D, Naciri-Azzouz A (eds) La Région Du Nord-Ouest Marocain. Parlers et Pratiques Sociales et Culturelles. Prensas de la Universidad de Zaragoza, Zaragoza, pp 93–108
- Kossmann MG (2018) Zenaga reflexes of Berber final weak verbs. *Folio Orientalia* 55:161–194
- Kossmann MG, Suchard DB (2018) A reconstruction of the system of verb aspects in proto-Berber-Semitic. *Bull Sch Orient Afr Stud* 81(1):41–56
- Lafkioui M (2018) The imperfective in Berber. In: Tosco M (ed) Afroasiatic. Data and perspectives. John Benjamins, Amsterdam, pp 85–103
- Lanfry J (1973) Ghadamès. étude linguistique et ethnographique. II. Glossaire (parler des Ayt Waziten). Fort-National, Algérie
- Mauri S (2015) Formal and functional properties of grammatical aspect in Ayt Atta Tamazight. PhD Thesis, The School of Oriental and African Studies, London.
- McCawley JD (1968) The phonological component of a grammar of Japanese. Mouton, The Hague
- Mourigh K (2016) A grammar of Ghomara Berber (North-West Morocco), *Berber studies* 45. Rüdiger Köppe, Köln
- Naït-Zerrad K (1998) Dictionnaire Des Racines Berbères (Formes Attestées) I. A-BEẒL. Paris/Louvain, Éditions Peeters
- Naït-Zerrad K (1999) Dictionnaire Des Racines Berbères (Formes Attestées) II. C-DĒN. Paris/Louvain, Éditions Peeters
- Naït-Zerrad K (2002) Dictionnaire Des Racines Berbères (Formes Attestées) III. D-GEY. Paris/Louvain, Éditions Peeters
- Oussikoum B (2013) Dictionnaire amzighe – français: le parler des Ayt Wirra, Moyen Atlas, Maroc. IRCAM, Rabat

- Prasse K-G (1973) Manuel de grammaire touarègue (tāhaggart) 2: VI–VII: Verbe. Éditions de l'Université de Copenhague, København
- Prasse K-G, Alojaly G, Mohamed G (1998) Lexique Touareg – Français. Deuxième édition revue et augmentée. Museum Tusculanum Press, København
- Serhoual M (2002) Dictionnaire Tarifit-Français. PhD Thesis, Université Abdelmalek Essaâdi, Tétouan.
- Souag L (2017) La Diffusion En Berbère : Reconcilier Les Modèles. In: Diffusion, implantation, convergence, Mémoires de La Société de Linguistique de Paris, N.S. 24. Peeters, Louvain, pp 83–107
- Stroomer H (Forthcoming) Dictionnaire tašlhiyt-français
- Sudlow, D. (2001). The Tamasheq of North-East Burkina Faso. notes on grammar and syntax including a key vocabulary. Köln: Rüdiger Köppe Verlag.
- Sudlow D (2009) Dictionary of the Tamasheq of north-East Burkina Faso. Rüdiger Köppe Verlag, Köln
- Taifi M (1992) Dictionnaire tamazight-français (parlers du Maroc central). L'Harmattan-Awal, Paris
- Taine-Cheikh C (1999) Le Zénaga de Mauritanie à La Lumière Du Berbère Commun. In: Lamberti M, Tonelli L (eds) Afroasiatica Tergestina. Paper from the 9th Italian Meeting of Afro-Asiatic (Hamito-Semitic) Linguistics, Trieste April 23–24, 1998. Unipress, Padova, pp 299–324
- Taine-Cheikh C (2008) Dictionnaire zénaga-fançais. Rüdiger Köppe Verlag, Köln
- Taine-Cheikh C (2010) Dictionnaire français-zénaga (berbère de Mauritanie). Rüdiger Köppe Verlag, Köln
- Van den Boogert N, Kossmann M (1997) Les premiers emprunts arabes en berbère. Arabica 44: 317–322
- van Putten M (2014) A grammar of Awjila (Libya): based on Paradisi's work. Rüdiger Köppe Verlag, Köln
- van Putten M (2018) Proto-Berber mid vowel harmony. Nord J Afr Stud 27(3):1–32