Mouton Grammar Library

A Grammar of Tamashek
(Tuareg of Mali)

W
DE
G

Mouton Grammar Library 35

Editors
Georg Bossong
Bernard Comrie
Matthew Dryer

A Grammar of Tamashek (Tuareg of Mali)

by

Jeffrey Heath

♾ Printed on acid-free paper which falls within the guidelines of the
ANSI to ensure permanence and durability.

Contents

Abbreviations

a. frequently cited works (for full details see under "References")

DN86	DNAFLA, *Lexique tamasheq.*
DTF	Foucauld, *Dictionnaire touareg-français.*
EPPB	Kossmann, *Essai sur la phonologie du proto-berbère.*
LTF2	Prasse et al., *Lexique touareg-français*, 2nd ed.
MGT	Prasse, *Manuel de grammaire touaregue* (tăhăggart)
TNEBF	Sudlow, *The Tamasheq of north-east Burkina Faso.*

b. dialects (localities and tribal groups)

A	Ansongo area
A-grm	Ansongo area in Gourma (south of Niger R.)
Gao	[not abbreviated]
Gnd	Goundam area
Gos	Gosi area
Grm	Gourma (zone south of Niger R.)
Hm	Hombori (in Gourma)
Im	Immenas
K	Kidal (city in northern Mali)
K-d	Kidal area, Kal Idnan tribe
K-f	Kidal area, Ifoghas tribe
R	Rharous (=Gourma Rharous) area
T	Timbuktu area
T-ka	Timbuktu area, Kal Ansar
T-md	Timbuktu area, Imeddedeghan
Ts	Tessalit area (west of Kidal)
W	Iwellemeden dialect of Tamajak, in Mali (e.g. Menaka) and Rep. of Niger
Y	Tayert dialect of Tamajak, in Rep. of Niger

c. other languages

Ar	Arabic
Bam	Bambara
Fr	French
HassAr	Hassaniya Arabic (Timbuktu area, also Mauritania)
KCh	Koyra Chiini (Songhay of Timbuktu and Goundam)
KS	Koyraboro Senni (Songhay of Bamba, Gao, and Ansongo)

c. categories and morphemes

Abstr	Abstractive
Anaph	Anaphoric (demonstrative suffix)
Approx	Approximative
Aug	Augment (§7.1.1)
BLC	backing and lowering consonant (§3.1.2.2)
Caus	Causative
Centrif	Centrifugal
Centrip	Centripetal
Comit	Comitative ('with')
Dat	Dative
Dem	Demonstrative
Dist	Distant (demonstrative)
Fe	Feminine
Hort	Hortative
Impf	Imperfective
Imprt	Imperative
Instr	Instrumental
Lo (in LoImpf)	Long
Loc	Locative
Ma	Masculine
MAN	mood-aspect-negation
N (in PerfN, etc.)	Negative
NearDist	Near-Distant (demonstrative)
Neg	Negative
O	object
P (in PerfP, etc.)	Positive
Pass	Passive
Perf	Perfective
Pl	Plural
Poss	Possessor (possessive)
PP	Prepositional Phrase
Prep	Preposition
Prohib	Prohibitive
Pron	Pronoun
Prox	Proximal (demonstrative)
RecAnaph	Recent Anaphoric (demonstrative)
Reslt	Resulative (verb stem)
S	subject
Sg	Singular
Sh (in ShImpf)	Short
SVS	surface vocalic sequence (§3.4.3.1)
VblN	verbal noun

Chapter 1
Introduction

1.1 Tuareg and Berber linguistics

The Berber family is part of the Afro-Asiatic (or Hamito-Semitic) phylum (1).

(1)   Afro-Asiatic Phylum

        a. Semitic
        b. Berber
        c. Egyptian
        d. Cushitic
        e. Omotic
        f. Chadic

A rough classification of Berber, based on but not identical to a 2004 on-line *Ethnologue* version, is (2).

(2)   Berber Languages and Locations

a. Northern Berber

Tamazight	Morocco (Middle Atlas range)
Tachilhit	Morocco (southwest)
Tarifit	Morocco (Rif range in north)
Chenoua	Algeria (Cherchell area)
Kabyle	Algeria (northeast)
Shawiya (Chaouia)	Algeria (Aurès range)
Mzab-Ouargla	Algeria
Nafusi	Libya and Tunisia
Ghadames	Libya (Ghadames)

b. Eastern Berber

Siwi	Egypt (Siwa oasis in west)

c. Southern Berber

Tuareg (Touareg)	Algeria, Mali, Niger (Sahara)

d. other

Zenaga	Mauritania
Guanche	Canary Islands (extinct)

The term **Tuareg** (French touareg or touarèg) is a Hassaniya Arabic rather than Berber term. It is the plural twaːrəg of the Hassaniya noun taːrg-i, which denotes a (freeborn) Tuareg warrior. The Tuareg refer to their own language as t-æ-mɑ̀ːʃæq-q (or variant, see below), a feminine noun based on a stem -mɑ́ːʃæɣ- whose core sense is again 'Tuareg warrior'. The northern Berber language name "Tamazight" is cognate.

Because Tuareg varieties are spoken by nomads and transhumants over a vast area in southern Algeria, northern Mali, the north of the Republic of Niger, and (more recently) in Burkina Faso, and because in a given local area there are many tribal and caste divisions that have linguistic ramifications, it is very difficult to decide whether we are dealing with a single "Tuareg" language (with many dialects), or two or more languages (each with some internal dialectal variation).

One popular division of Tuareg is given in (3).

(3)   Tuareg (Popular Version)

a.	Tamashek (Tamachek, Tamashaq)	Mali (except Menaka)
b.	Tamajak (Tamajek, Tamajeq)	Niger, Mali (Menaka)
c.	Tamahak (Tamahaq)	Algeria (Hoggar range)

The division in (3) is based on the pronunciation of the name for the language itself, which consists of FeSg affix complex t-ɑ-...-t (as in all language names) sandwiched around the noun stem -mɑ́ːʃæɣ- (or variant). The difference is in the sibilant, which appears as š in Tamashek (see above), as ž in Tamajak (where "j" is pronounced as in French), and as h in Tamahak.

However, Tamajak itself is divided into two rather distinct groups that might be regarded as having autonomous status. The version in (4) is therefore arguably better than the popular version, though at present I have no well-researched view on the matter and reserve the right to change my mind in the future.

(4)   Tuareg (Revised Version)

a.	Tamashek (Tamachek)	Mali (Kidal, Gao, Timbuktu)
b.	Tawellemmett (Tawallammat)	Niger (NW), Mali (Menaka)
c.	Tayert (Tayart)	Niger (north, Air range)
d.	Tamahak (Tamahaq)	Algeria (Hoggar)

Tawellemmett is the language of the Iwellemeden tribal confederation that occupies much of northwestern Niger and extends into the Menaka region in eastern Mali. Tayert is named after the Air mountains.

In the on-line *Ethnologue* (on the SIL webpage, viewed in 2004), population figures were given as 270,000 for Tamashek, 62,000 for Tamahak, 640,000 for Tawellemmett, and 250,000 for Tayert.

I will use the term Tamashek in this fashion, i.e. for the Malian varieties except for the Tawellemett of Menaka. However, the term is often used in Mali as a general term for all Tuareg varieties in the country, including the Tawellemmett of Menaka. To distinguish the two major types of "Tamashek" in this official usage, the terms in (5) are in use.

(5)   Malian Tuareg

       a.   Taneslemt (t-a-n-ə̀sləm-t)   Timbuktu (also Gao, Kidal)
       b.   Tanastaramt (t-a-næs-tæ̀ram-t)   Timbuktu
       c.   Tadghaqq (t-ə̀dɣaq-q)   Adrar (and Kidal)
       d.   Tawellemmett (t-a-wəlľə̀mmət-t)   Menaka

Taneslemt, which can be extended to cover the non-Tawellemmett dialects of Mali, corresponds roughly to "Tamashek" as I use the latter term. "Taneslemt" is based on a root meaning 'Muslim', on the ground that in the old days the Iwellemmeden were not especially pious, whereas other Malian Tuaregs included some devout maraboutistic clans. Tanastaramt is based on a cpd noun a-næs-tæram 'westerner', while Tadghaqq is based on á-dɣaɣ 'rock; mountain' (cf. "Adrar").

There is a traditional Tuareg syllabary known as t-i-finaɣ. It did not seem to be in active use in the areas where I did my fieldwork (e.g. Timbuktu, Gao). My impression is that it is chiefly used in parts of Algeria. Its existence, however, is well-known locally and it is a source of some ethnic pride.

1.2 Literature on non-Tamashek Tuareg

For **Tamahak** (Algeria), the major work is the great *Dictionnaire touareg-français* (abbreviation DTF) of the famous (and famously assassinated) French officer and later missionary Charles de Foucauld (lived 1858-1916). DTF was published posthumously in four volumes (1951-52). It is now somewhat difficult to use because of its rarity, its great physical size (the handwritten manuscript was published by photography), and its not very modern orthography ("ou" for w, "i" for y, "ṛ" for ɣ, etc.). Foucauld had a hard time hearing the distinction between the two short vowels, and did not understand the accent system. Nevertheless, his dictionary is monumental, and its entries contain rich semantic detail with abundant exemplification, and not a little ethnographic material. Foucauld also made a serious effort to identify natural species. It is one of the greatest of all missionary dictionaries of its era.

For **Tamajak** (Republic of Niger), the major work is the *Lexique touareg-français* of Prasse et al. (2nd ed., 1998), which carefully distinguishes Tawellemett ("W") from Tayert ("Y") items throughout. This dictionary is of a high standard, uses a modern phonemic orthography, and has the necessary morphological data for each stem. Two shortcomings that will hopefully be

rectified in future editions are the absence of scientific identifications of flora-fauna species, and the omission of accents on stems other than verbs (verbs generally have grammatically predictable accents).

For **Burkina Faso** we now have David Sudlow's handy work, *The Tamasheq of north-east Burkina Faso* (2001), which includes some lexical lists organized by domains as well as grammatical information. The migrations into Burkina began in earnest around 150 years ago and have been continuous, as desertification has pushed Tuaregs south. The dialects spoken in Burkina reflect the diverse origins of the migrants, but Tawellemett is well represented.

Prasse's three-volume work, *Manuel de grammaire touarègue* (1972-74), is an elaborate systematization of data from Foucauld from the Hoggar. In this work, Prasse analyses Tuareg phonology and morphology (the fourth volume on syntax did not appear), in historical linguistic terms. The *Manuel* is an important work for Berberists, but the author's perspective is somewhat idiosyncratic, since he connects attested modern Tuareg forms directly with Pre-Proto-Berber reconstructions. Much of his interest was in presenting a Pre-Proto-Berber reconstruction with three short vowels in addition to the less controversial long (full) vowels. Synchronically, Tuareg has two short vowels æ and ə, which are themselves partially merged in some dialects depending on following consonants, and the non-Tuareg Berber languages generally have just one short vowel phoneme. Unfortunately, the *Manuel* was written before the author's Niger-based *Lexique*, and was therefore based largely on Foucauld, whose transcriptions of short vowels for Tamahak were highly unreliable. In addition, the *Manuel* (like the *Lexique*) was written in the absence of good synchronic analysis of accent, which turns out to interact in significant ways with the ablaut system. In general, the *Manuel* is of greatest interest for its analysis of vocalic ablaut, and of a series of other, specific historical linguistic issues.

Another important recent work on Proto-Berber is Maarten Kossmann's *Essai sur la phonologie du proto-berbère* (1999). This is essentially a collection of topical studies, addressing a number of cruxes of Berber historical phonology.

1.3 Historical background

Historians and archeologists are in broad agreement that there has been a long-term southward shift of Saharan populations over at least 1500 years. Around the year 500 AD, significant portions of the Sahara were sufficiently moist and temperate to accommodate permanent human settlement, while the Middle Niger River area was swampy and too infested with disease-bearing flies to permit year-round habitation. Over the centuries, climatic changes have made some of the Sahara almost completely uninhabitable (and impassable), including a significant expanse west of Araouan (north of Timbuktu). Other areas could be used for grazing part of the year (assuming normal wet-season

rainfall) but could not support permanent settlements. During the most recent few centuries, the only Saharan zones relevant to the Tuareg that could support continuous settlement were those in the moutainous areas: the Hoggar in southern Algeria, the Adrar des Ifoghas in far northern Mali, and the Air of Niger. These hills provide water (mountain springs, rainwater ponds in rocky depressions, wells) and defensive positions. The three hilly zones have been the major demographic concentrations of Tuareg north of the Niger River.

An important factor in the southward movement was the arrival of Arabs in North Africa. This began with the first Arab invasions of the end of the 6th century, but (from the Tuareg perspective) the main blow was the arrival of Arab beduin (the Bani Hilal and related tribal groups) in the 11th century and their spread over the next two centuries through much of non-maritime Libya, Tunisia, Algeria, and Morocco and into Mauritania, the Western Sahara, and northwestern Mali. Although some Tuareg were already present in the Hoggar, the Air, the Adrar des Ifoghas, and points south (perhaps already including Timbuktu), demographic pressures from the 11th to 13th centuries, resulting from the Hilalian invasion, pushed more Tuareg south into something like their present range in Mali and the Republic of Niger.

The Central Sahara (including the three mountainous zones mentioned) has been a particularly difficult place to live in during the last millennium. Desertification has been continuous, but has accelerated since 1970 (a devastating drought in 1972, smaller droughts off and on from then until 1985, overgrazing of grasslands, deforestation due to excessive cutting of firewood). Those Tuareg who did not live near the Niger River lost most if not all of their animals, and thousands of them died of hunger and thirst.

For much of the last millennium, climatic changes have been exacerbated by the rise of a highly elaborated culture of raiding (razzia). The Tuareg warrior clans, like the Arab reguibats farther west (high desert around the Mauritanian-Malian border area), terrorized both settled villages and the trans-Saharan caravan trade. They have been a major cause of economic backwardness, and of the rarity of stable political structures, in the Tuareg dominated areas since the Hilalian invasion. The ferocity of Tuareg warriors constituted a major obstacle for French colonial penetration, though after considerable bloodshed the colonial forces did eventually gain a degree of control (especially in Algeria). In recent decades, Tuaregs were recruited in large numbers to fight on the Libyan side of the Chad wars of the 1980's, and against the Russians in Afghanistan. Some veterans of these foreign wars later participated in banditry, guerilla attacks, or larger-scale rebellions in northern Mali and Niger. The major event in Mali was the Arab-Tuareg rebellion of 1990-95, where the rebels operated out of bases deep in the Sahara, mounting guerilla attacks on Songhay villages, on government police, and on army outposts. There was one one full-scale rebel assault on each of the two major riverine provincial capitals, Timbuktu and Gao. The rebellion stalled, and the Songhay population organized a paramilitary defense force (Ganda Koy), supplementing the regular government army. Ethnic cleansing was carried out

in much of the zone (some reprisal killings, but mainly forcing Tuareg and
Arab civilians into exile). In 1995 a generous peace was signed, many Arab
and Tuareg combatants were integrated into the government army, and
refugees began to come back under the auspices of the UNHCR and several
NGOs. While some resettled Tuaregs went back to their traditional territories
and lifestyle, many have shifted farther south (i.e. to the Gourma, the Gosi-
Hombori area, or Burkian Faso). Others have been converted from desert
pastoralists to agriculturalists, e.g. growing rice along the river.

1.4 Malian Tamashek

As noted above, the varieties covered in this volume are those of **Tamashek** in
the narrow sense, excluding Tawellemmett but including the other Malian
varieties (Goundam, Timbuktu, Gao, Ansongo, Kidal, and the Gourma area
south of the Niger River including Gosi and the outskirts of Hombori).

There is considerable dialectal diversity within Tamashek even in its
narrow sense. Although the dialectal boundaries are rather fluid, one can
roughly group the dialects into three divisions (6).

(6)   Main Divisions of Malian Tamashek

        a.   Kal Ansar dialects around Timbuktu (T-ka)

        b.   mainstream Tamashek including Kidal, Tessalit, the Gao area,
              and the non-Kal Ansar (i.e. mostly Immededeghan) groups
              around Timbuktu; dialects of this general type are those
              abbreviated K (also K-d, K-f), T-md, I, R, Ts, Th.

        c.   dialects with some "eastern" features, spoken by certain groups in
              the Gourma of Gao and Ansongo, represented here by A-grm
              (Ansongo-Gourma).

    This grammar is focused on the rather distinctive Timbuktu-area Kal
Ansar (T-ka) dialects, but it includes a fair amount of comparative material
from the other types insofar as they differ structurally from T-ka. One
recurrent difference is that T-ka shows much broader Short-V Harmony, by
which original *æ (short a) has become ə when the following syllable has a
high vowel {i ə u}. The Kal Ansar also have a larger number of Arabic
borrowings, and retain Arabic pharyngeal consonants ħ and ʕ (instead of
merging them into x and ɣ, respectively, like other Tuareg varieties). My
grammatical and textual data are more thorough for T-ka than for the other
groups, so my coverage of grammatical differences among the dialects is not
exhaustive. My dictionary of Tamashek will include extensive material from

all dialects, and further detail on dialectal stem morphology can be gleaned from it.

The Tuareg were and in some cases still are nomadic or transhumant. Major tribal migrations have occurred over time, to which we may add extensive recent migrations due to rapid desertification (especially severe since 1970), and organized resettlement into new communities of returning refugees and combattants following the settlement of the Tuareg-Arab rebellion of 1990-95. Each local zone therefore has a complex settlement history. The resulting linguistic variation, and the range of ecological zones inhabited, are particularly challenging for the dictionary, but they also complicate grammatical analysis and the processing of texts.

The traditional social divisions (or **castes**) in Tuareg society were defined by (mostly male) occupational specialties: a) **warriors** (æ-mášæɣ, Pl i-mûšaɣ), b) **vassals** (a-móɣid, Pl ĭ-mɣad), c) **marabouts** (Muslim holy men, often mendicant), d) **artisans** (blacksmith, Fr *forgerons*) working with metal, leather, and wood (Sg é-nhæḍ, Pl ĭ-nhæḍ-æn), and e) **slaves** (á-kli, Pl èkl-ɑn). Orthodox Islam has now spread to all Tuareg castes, but in the past religious activity was mainly confined to the maraboutistic clans. In the southerly Tuareg areas, where black slaves were abundant, the category "vassal" was never as well-defined as it was farther north (Algeria). With the abolition of slavery, the decline (except in times of rebellion) of tribal warfare and raiding (razzia), and the resettlement of many Tuaregs in towns or agricultural villages, traditional lifestyles have in many cases been dramatically altered. Nevertheless, most people continue in some form of the traditional pastoral lifestyle, spending at least part of the year in isolated villages, tending what is left of their herds, relying on milk and cheese for a good part of their sustenance. The Tuareg are popular among tourists, creating some jobs as guides and providing new markets for the wares (jewelry, swords, boxes, leatherwork) of the metalsmiths.

A somewhat special case is the **Bella**, the (former) slave caste, whose traditional specialty in Tuareg economy was raising small livestock (sheep and goats). Many of them are now in the cities and large towns, working as herders, hard laborers, or domestic help for wealthier families. The Bella speak roughly the same Tamachek varieties as their (former) owners, but have some dialectal peculiarieties, and in some cities there are signs of an incipient shift from Tamashek to a Songhay language among younger Bellas.

1.5 Neighboring languages

In the western part of their zone, i.e. around Timbuktu and from there west to Goundam and beyond, Tamashek is spoken chiefly in villages that are not too far from the Niger River. There are a number of Tamashek villages near Timbuktu and Goundam, but the high desert farther north (e.g. Araouan, Taoudenni) is basically Arab country. Moreover, in the sub-riverine area

where Tuareg-Bella groups are found, they are often in contact with Arab groups, and both Arab and Tuareg-Bella minorities are found in the larger towns and cities (Goundam proper, Timbuktu and its ports, Gourma Rharous). The local Arabic vernacular is a variety of **Hassaniya Arabic**, the beduin Arabic of Mali, Mauritania, and the Western Sahara. The local variety differs somewhat from the better described Mauritanian norm, for example in preserving short *ŭ as a distinct phoneme. Comparison of Timbuktu-area Hassaniya with Timbuktu-area Tamashek indicates that although Hassaniya has many Berber loanwords, the latter are usually not from the (current) local Tamashek varieties. It appears that most of the Berber lexical stratum in Timbuktu Hassaniya derives either from non-local Berber languages (including Zenaga in Mauritania), or from former Berber languages of the Timbuktu area that are no longer extant locally. Tamashek likewise is deeply impregnated with Arabic vocabulary, but much of it seems to reflect more ancient Arab-Tuareg contacts, probably much farther north.

Along the Niger River itself, thoughout the zone relevant to Tamashek, the dominant languages are **Koyra Chiini** (e.g. Goundam, Timbuktu) and **Koyraboro Senni** (from Gourma Rharous and Bamba through Gao to the border with the Republic of Niger). These are the two major Songhay languages of Mali. Koyra Chiini is of S-infl-V-O type with traces marking object extraction sites, while Koyraboro Senni is an S-infl-O-V-X language with resumptive pronouns in extraction contexts. Current government nomenclature lumps them together (along with other Songhay languages) as "soŋay," only the Koyraboro Senni dialect of Gao being taught in literacy programs. In any event, the local Songhay variety is used in interethnic communication (e.g. in the markets) and is generally learned by Tuaregs and Bellas as a second language. As the Tuareg and Bella resettle into towns and cities where a Songhay language predominates, and partially adjust in lifestyle (e.g. shifting from milk and cheese to millet grain as a staple food), some relevant Songhay vocabulary is creeping into Tamashek speech.

In the major Tuareg concentration in the north around Kidal and the hills of the Adrar des Ifoghas, there are no major competing languages, though there are a few Arab villages and some Arab traders in the towns.

In the Gourma (the area south of the Niger River), there are broad expanses of flat, arid land away from the river that the Tuaregs and Bellas have largely to themselves. However, as they approach the river they encounter speakers of the Songhay languages mentioned above, and there are some Songhay in Gosi (the only real town). At the southern fringe of the Gourma, where the flat land is suddenly punctuated by the cliff faces of inselbergs, the few local Tuareg encounter speakers of another Songhay language, **Humburi Senni** of the Hombori area, along with ethnic Fula who speak either **Fulfulde** or a variety of Koyraboro Senni called **Foulan Kirya**. Since many of the Tuareg of the Gourma have migrated recently from the Timbuktu-Goundam area, the local Tamashek variety seems to have been little affected by these peripheral contacts.

As noted above, around Menaka we get Tamajak instead of Tamashek proper. In that zone, straddling the Mali-Niger border, there is also an important nomadic group of cultural Tuaregs known as Daoussahak who speak **Tadaksahak**. This language has a Songhay base (pronouns, inflectional particles, maybe 250 items of core vocabulary), but most of the lexicon (including some "core" items) is from Tuareg, and Tuareg influence in grammatical categories, syntax, and prosody is conspicuous. There are also some Fulfulde-speaking groups near the Niger River south of Menaka.

Of these non-Tuareg languages, Arabic has had by far the greatest influence on Tamashek, but the influence seems to be largely confined to lexical borrowing. Of course loanwords in areas related to Islam and sharia law (prayer, holy days, days of the week, lunar months, divorce) are very common, but there are also some loans in other domains, sometimes from vernacular rather than classical Arabic. Arabic loans may have spread within the Tuareg domain, from dialect to dialect, or they may have entered different Tuareg varieties independently. Many of the Arabic loans also occur in other regional languages (e.g. Songhay, Fulfulde), and in some cases there are phonological indications that an Arabic term passed first into Tuareg and from there into languages farther south.

1.6 Fieldwork and other data

I have worked in northern Mali since 1986, including annual visits since 1989. In 1986 and 1989 I worked chiefly on Hassaniya Arabic. From 1990 to 1998 I concentrated on Songhay languages, and am still finishing up this work. From 1999 to 2003, however, I focused on Tamashek. I am simultaneously completing a Tamashek-English-French dictionary which I expect to be published by Karthala, Paris. I have put great emphasis on lexicography in this project, and I have drawn heavily on lexical data in this grammar. I am considering the best way to make my textual data available, perhaps in an electronic format, in the next few years.

In the field, the first order of business was compiling a decent working lexicon. I undertook systematic lexical elicitation, primarily in Timbuktu in summer 1999 and autumn 2000, with emphasis on ecological vocabulary (natural species and related terminology). With a lexicon of about 2500 items I then undertook analysis of dialogue tapes that I had recorded over the years in Timbuktu (T-ka and others), Gao (speakers from the Kidal areas), and Hombori (speakers living in the Gourma, most of whom were ultimately of Timbuktu or Goundam origin). I also made some recordings of Tamajak (and Tadaksahak) speakers in Menaka. I commissioned preliminary transcriptions and French translations of several of the tapes from government applied linguists in Bamako, namely Rhali Ag Mohamed of DNAFLA (native of Kidal) and Mahmoud Ag Oyett of IPN (native of Menaka). I later took these

transcriptions and the tapes back into the field and prepared corrected versions of the transcriptions.

An outline of the grammar, focusing on the T-ka dialect, was developed into a more comprehensive draft with a native speaker present in Bamako in summer 2001. Modifications and additions were made thereafter based on closer analysis of texts, and follow-up elicitation in summer 2002. In that trip I also went over the Timbuktu-biased dictionary draft with a native of Ansongo-Gourma for several weeks. In summer 2003, I went through the by now rather large dictionary draft with a native of Kidal (Kal Unan tribe) then in Gao. Of course some grammatical material was also gathered from the Ansongo-Gourma and Kal Unan speakers. I was able to work for about a week with a speaker from the Gourma Rharous area, and few a few days each with speakers from Kidal (Ifoghas), Immenas, and Tessalitt. In 2003, Mahmoud Ag Oyett and I organized a three-day workshop for Tamashek applied linguists and teachers in Gao, and I was able to glean some interesting dialectal details from the participants.

The most urgent remaining task for the analysis of Tamashek is a fuller study of phrase- and clause-level prosody based on recorded texts.

1.7 Acknowledgements

Chapter 2
Overview

A sketch of major highlights of Tamashek grammar here will provide an overall summary of the morphosyntactic type of the language. This should help non-Berberist readers to make sense of phrasal and clausal examples in the main chapters. Scanning the text in Chapter 16 in conjunction with this sketch is also recommended.

2.1 Recurrent morphosyntactic patterns

Abstracting from the complexities of the grammar, the central morphosyntactic construction in Tamashek can be represented as (7).

(7)   [X Y′ ...]

where X is a phrase- or clause-initial element (word or particle), Y′ is an immediately following word, and Y′ is a modification in the form of the corresponding independent form Y. "Immediately following" means that no word or fixed-order particle intervenes, though floating **clitics** that happen to attach to X are allowed. I refer to the relation between X and Y′ as a **local dependency**. The relevant constructions are in (8), where "verb" refers to inflected (=finite) verbs, and "participle" (used in subject relatives) is a special form of a verb stem with subject number-gender agreement only.

(8)   [X Y′ ...] Local Dependencies (Requiring Adjacency)

	X	Y′	modification in Y′
a.	preposition	noun	Prefix Reduction
	verb	noun (subject)	Prefix Reduction
	compound initial	noun	Prefix Reduction
b.	Negative particle	verb	ablaut change
c.	definite demonstrative	verb	ablaut change
	definite demonstrative	participle	ablaut change

In (8.a), a morphophonological rule Prefix Reduction (e.g. -ɑ- reduced to -æ-, or -i- reduced to -ə-) applies to nouns in combinations with specific preceding forms. Of special interest is the fact that reduction applies to the

verb-subject sequence, but not to a **verb-object** sequence. For more on the role this plays in "case marking," see §2.3, below.

For verbs, the only true local dependency is that of an inflected verb on a preceding Negative (8.b). This applies in all combinations where no elements (other than floating clitics) intervene between the two, hence to perfective, (long) imperfective, and imperative (i.e. prohibitive) stems. Basically the modification converting Y to Y′ adds phonetic content (where it is not vacuous) in the perfective, reduces phonetic content (erasing a V-length ablaut formative $\bar{\chi}$-pc1 and an accent ablaut formative $\acute{\chi}$-pc1) in the imperfective and prohibitive, and modifies the stem vocalism in all of these stems.

The cases in (8.c) are limited to **definite relative clauses**, which begin with a definite demonstrative (in apposition to the head NP, which if overtly expressed is external to the clause). The modification in ablaut form of the verb involves erasure of a V-length ablaut formative ($\bar{\chi}$-pc1), and (with specific exceptions) a shift in the location of the ablaut accent formative (in one combination, this formative is entirely erased). The formulation of the relevant rules requires an extraordinary interpenetration of "syntax" and "phonology," and constitutes an important empirical argument against highly modularized theories of grammar.

It is possible to combine two [X   Y′...] configurations, as in the combination [Negative verb noun(subject) ...]. In this combination, the relevant pairs involving local dependencies are [Negative verb] and [verb noun(subject)]. As a result, internal bracketing as in [Negative [verb noun(subject)] ...] or [[Negative verb] noun(subject) ...] is counterproductive (any such bracketing would appear to separate two forms that enter into a local dependency). The only points that matter are adjacency (disregarding clitics) and the grammatical relationship (e.g. Negative + verb, or verb + noun(subject).

Superficially similar cases are those in (9)

(9)   [X Y′ ...] Dependencies Not Requiring Adjacency

X	Y′	modification in Y′
Future particle	verb	Short Imperfective
complementizer	verb	Short Imperfective

The cases in (9) involve either a Future particle or a particular type of complementizer, plus an inflected "Short Imperfective" form. The latter cannot be used clause-initially with its usual subject pronominal inflections. However, the short imperfective is related to the positive imperative (which has no morphological connection to the prohibitive). The positive imperative is clause-initial (hence is preceded by no "X" element), and it lacks the usual subject pronominals.

Importantly, while the [X Y' ...] depencies in (8) require direct adjacency (except that they allow floating clitics to be hosted by X), the dependency of the Short Imperfective on the Future particle or on the complementizer in (9) can extend to a second short imperfective clause appended to the first one, with no repetition of the X element. Thus [Future ShImpf$_1$, ShImpf$_2$] is grammatical, where both verbs are under the scope of the Future morpheme (cf. English *he will come, and eat*). No confusion is likely, since the ShImpf cannot be used in the absence of a dependency. In other words, a ShImpf can be triggered by a **variable-distance dependency**; compare the concept of "série enchaînée" adapted from other Berberist literature to Tuareg by Leguil (1992:43). By contrast, we cannot get e.g. #[Neg Verb$_1$, Verb$_2$] where both verbs are under the scope of the negator; the correct expression is [Neg Verb$_1$, Neg Verb$_2$] with the negator repeated, since adjacency is required in local dependencies.

2.2 Nouns

Examples of singular nouns are in (10)

(10)	a.	æ-bájən	'monitor lizard'
	b.	t-æ-s-ãnɑn-t	'oxpecker (bird)'
	c.	deké	'basket'

The masculine noun in (10.a) and the feminine noun in (10.b) have vocalic prefixes, here -æ- (other nouns have -ɑ-, -e-, or -ə-). Since the prefix changes to -i- in the plural, I gloss it as "Sg" or "Pl" as the case may be. (10.c) is an example of a noun with no vocalic prefix (most such nouns have masculine agreement). The feminine noun (10.b) additionally has a Fe[minine] prefix t- and a Feminine Singular (FeSg) suffix -t, which could be summed up as a FeSg circumfix t-...-t. For feminine nouns of the same basic type that end in a vowel, an additional (inner) Fe suffix -t- is added, so the singular noun has an affix frame t-V-...-t-t. The inner -t- is retained in suffixal plurals (t-V-...-t-en), but the whole -t-t sequence is dropped in unsuffixed ablaut plurals. Some feminine nouns lack the suffixes even in the singular, showing only the Fe prefix t-.

While most noun stems are underived, some are derived (by some combination of ablaut and prefixation). This is the case with 'oxpecker' (10.b), which contains an -s- prefix, cf. prefixally derived causative verb (PerfP) -æss-onæn- 'tame, break in (animal)'. The vocalic prefix precedes the derivational prefix.

Pluralization of nouns is by affixation, by ablaut, or by a combination of the two, depending on the noun (some nouns have alternative plurals, typically one affixal and one ablaut). In the purely affixal plural, the vocalic prefix (if present) becomes -i-. Masculines add suffix -æn or -tæn (the latter is common

after a vowel or after a stressed C-final syllable), and feminines add suffix -en or -ten, replacing FeSg -t. Examples of affixal plurals are deké-tæn 'baskets' and t-i-s-ànɑn-en 'oxpeckers'.

Other nouns form the plural by stem-ablaut (in addition to the usual change of the vocalic prefix to Pl -i-). The final vowel of an ablauted plural stem appears as ɑ, while other stem vowels are realized as high (normally u if full, ə if short). Examples of ablaut plurals for nouns in (10) are i-bújɑn 'monitor lizards' and t-i-s-únɑn 'oxpeckers' (the latter competes with affixal t-i-s-ànɑn-en).

There are also a number of plural patterns involving a mixture of ablaut (perhaps just a change of quality in a final vowel) and affixation.

2.3 Prefix Reduction

It was mentioned above that nouns express (local) dependency on a preceding element by undergoing Prefix Reduction. This applies to a subject (but not object) noun after a verb, to a noun functioning as complement of a preposition, and to a noun stem functioning as a compound final.

Most nouns have a vocalic prefix -i- in the plural. This Pl prefix is audibly reduced to -ə- or zero in the relevant syntactic positions. These same nouns have a vocalic prefix -ɑ-, -e-, -æ-, or -ə- in the singular. Of these Sg prefixes, -æ- and -ə- are already short vowels and cannot be audibly reduced. However, -ɑ- and -e- are reduced to a short vowel, either -ə- or -æ- depending on dialect and on the height of the vowel of the following syllable. Nouns that do not have a segmentable vocalic prefix are unaffected by Prefix Reduction.

The position of the accent is unaffected by Prefix Reduction. In particular, if the vocalic prefix happens to be accented, its reduced variant (other than zero) continues to bear accent. In cases where Pl vocalic prefix -i- is reduced to zero, the accent shifts to the preceding syllable (i.e. to the final syllable of the preceding word). Thus t-í-hɑtt-en 'sheep-Pl' occurs in the locative PP dæɤ ʾt-ə́-hɑtt-en 'in the sheep', with a dialectal variant (e.g. K-d) dæ̀ɤ ʾt-Ø-hɑtt-en.

Where Prefix Reduction has applied audibly, the symbol ʾ is given at the beginning of the word in question. Thus é-hæn 'house' has a reduced form ʾǽ-hæn.

2.4 Noun phrases

Noun phrases (NP's) begin with a head noun (the lexical head of the NP), which may be followed by a demonstrative, a possessor (with preposition ə̀n), or a relative clause (subject or non-subject type). "Adjectives" are a special case of subject relative (see below). Numerals, however, normally precede the modified noun, except that 'one' may follow the noun when it functions as an

indefinite determiner rather than as a true numeral. In (11), the lexical heads
are 'man' (11.a-b), 'place' (11.c), and 'men' (11.d).

(11)   a.   æ-hálǝs   w-á
                 Sg-man   Ma-Dem.Sg
                 'this man' (demonstrative)

        b.   æ-hálǝs   mæqqór-æn
                 Sg-man   be.big-Partpl.MaSg
                 'a big man' (relative clause)

        c.   é-dægg   [n   æ-hálǝs]
                 Sg-place   [of   Sg-man]
                 'the place of the man' (possessor)

        d.   ǝssín   méddǝn
                 two.Ma   man.Pl
                 'two men' (numeral)

There is no regular definiteness marking, so in isolated sentences we can
frequently translate NPs as indefinite or definite.

2.5 Verbs

Tamashek verbs have a number of stems distinguished by ablaut. The basic set
of inflectable stems, organized into **three subsystems** on morphological
grounds, is given in (12).

(12)   Verb Stems

        a. perfective subsystem

                PerfP [perfective positive]
                PerfN [perfective negative] (after Neg wæ̀r)
                Reslt [resultative] (positive only)

        b. short imperfective subsystem

                ShImpf [short imperfective] (after Fut ǎd or complementizer)
                Imprt [imperative] (in positive only)

c. long imperfective subsystem

> LoImpfP [long imperfective positive]
> LoImpfN [long imperfective negative] (after Neg wằr)
> Prohib [prohibitive] (after Neg wằr)

For example, 'get' has PerfP -ə̀jræw-, ShImpf -ə̀jrəw-, and LoImpfP -járræw-. The perfective and short imperfective subsystems generally differ only in vocalism, while the long imperfective subsystem is characterized by consonantal (as well as vocalic) ablaut features.

Some of these stems can occur clause-initially, but others (PerfN, ShImpf, LoImpfN, Prohib) occur only after a preverbal particle (for the ShImpf the relevant particle need not be adjacent). The specifically negative stems occur after Negative preverb wằr. The ShImpf stem is used after Future àd and in some other dependent positions.

The Reslt is very common, and in many cases can be translated as a present-tense stative verb in English ('know', 'be sitting'). The LoImpfP denotes recurring or habitual events, as well as progressives ('be dancing').

For morphological purposes, it is necessary to distinguish numerous verb classes, based on their basic stem shape, e.g. -vPQvC- or -CuCCʋ- (+ -t). See §2.11, below, for the notation. Two important factors in verbal morphology are the heaviness of the stem (light, middleweight, or superheavy, the latter two subsumed under "heavy"); the presence of any full V's initially, medially, or finally; and (for V-final) stems whether the verb takes Augment -t.

Participles, which agree in number and gender (but not person), are used in subject relatives. They can be formed from those non-imperative verb stems that occur clause-initially (PerfP, Reslt, LoImpfP). In combinations involving a preverbal particle, the Participial affix can be added to the particle, the details depending on dialect. Modifying adjectives are a special case of intransitive participle.

Essentially all verbs have a **Verbal Noun** (VblN) formed by ablaut. A large number of verbs also have an Agentive. There are a number of less productive nominalization patterns confined to a few verbs.

Valency-changing derivations include causative, mediopassive, passive, and reciprocal. These categories are expressed by derivational prefixes with some associated ablaut changes. Causative and passive are especially productive, and layered derivations (e.g. passive of causative) are very common. Each such derived verb has its own full set of stems of type (12), as well as participles and a VblN.

2.6 Simple main clauses

Simple main clauses have the shape [verb(-\clitics) (subject) (object) ...]. Clitics may include object or dative pronominals, directionals, and/or PPs with

pronominal complement. A clitic boundary is represented as -\ instead of just the hyphen -, and instead of = (not available in my phonetic font). When both subject and object are expressed by nouns, the subject noun precedes the object noun.

(13) ənhæ̀y-æn   médd-æn   élu
      see.PerfP-3MaPlS   man-MaPl   elephant
      'The/Some men saw the/an elephant.'

A subject or object noun (but not both) can form an accentual phrase with a preceding verb. Default and secondary accents are applied from right to left. Thus, in (13), [ənhæ̀y-æn médd-æn] is an accentual phrase, with a lexical accent on the é of médd-æn and a secondary accent on the second syllable to its left. In isolation, the verb is ə̀nhæy-æn with default accent on the antepenult. If the noun médd-æn is omitted in (13), we would get [ənhæ̀y-æn élu], where the object noun now forms an accentual phrase with the verb. Two adjacent nouns are never grouped accentually, so as (13) stands élu has no accentual interaction with médd-æn.

If the clause is future or negative, there is a preverbal particle (Future ə̀d or allomorph [including ɑ-], or Negative wæ̀r), and any clitics attach to this particle, hence [preverb(-\clitics) verb (subject) (object) ...]. In (14) I illustrate the [preverb(-\clitics) verb] sequence, with a pronominal object (3MaSg) plus a directional (Centrifugal) in the clitic cluster.

(14) ɑ-\tt-\ìn   ìtɑw-æ̀ɣ
      Fut-\3MaSgO-\Centrif   forget.ShImpf-1sgS
      'I will forget him.'

Other constituents (e.g. adverbials, including PPs with nominal complement) come at the end of the clause, though as noted above pronominal PPs are usually cliticized.

(15) a. i-là-\fæll-ì   ælħæqq
          3MaSgS-have.Reslt-\on-1Sg   right
          'It (=animal) has a right on me.' (='I have an obligation to it.')

      b. i-tátt   mæ̀sæku   dáɣ
          3MaSgS-eat.LoImpfP   sweet.potato   too
          'He eats sweet potato too.'

      c. əwæt-æ̀ɣ-\dər-əs   édi
          hit.PerfP-1SgS-\Instr-3Sg   dog
          'I hit the dog with it.'

Regardless of whether a subject NP is present, the pronominal category of the subject is expressed on the verb. Thus ə̀jjæš-æn 'they-Ma entered', or with explicit subject NP əjjæ̀š-æn médd-æn 'men entered'.

A noun in subject function following its verb, or a noun functioning as complement of a preposition, undergoes **Prefix Reduction** (§2.3, above). This does not apply to an object noun, even when it immediately follows the verb. Prefix Reduction in an immediately post-verbal noun is therefore diagnostic of subject as opposed to object status, for those nouns whose pronunciation is audibly affected by Prefix Reduction (i.e. those with vocalic prefix allomorph ɑ- or e-). Nouns whose vocalic prefix is already short, or that lack a vocalic prefix, show no subject/object variation in form.

2.7 Clitics

Clitics are attached to the **leftmost word** of the clause (a complementizer, a preverbal particle like Neg or Fut, a clause-initial verb, the head noun in an indefinite relative clause, the demonstrative in a definite relative clause or in a focalized clause). Head nouns of definite relatives, focalized constituents, and topicalized constituents are treated as external to the clause and therefore do not host clitics. I use the notation -\ for the boundary between a clitic and a preceding word or clitic.

In a transitive clause, if the **direct object** is expressed by a pronoun, it takes the form of an object clitic (16).

(16)   t-ə̀nhæy-\tæ̀n   ˀt-æ-mæ̀t-t̞
        3FeSgS-see.PerfP-\3MaPlO   Fe-Sg-woman-FeSg
        'The woman saw them.'

There are a number of prepositions that can take NP complements. A pronominal complement is expressed by a suffix on the preposition, e.g. -\sər-əs 'with 3Sg' (instrumental). Such preposition-pronominal combinations are treated as clitics and attach to the clause-initial constituent. There is also a special set of dative pronominals that always appear as clitics.

Other clitics, besides object pronominals and pronominal prepositions, are the **directionals** (Centripetal -\ə́dd with dialectal variant -\ídd, Centrifugal -\ín). It is possible to get several clitics piled up on a single host, the directionals coming last. The directionals may also be doubled (on the verb and on a preverbal particle). See Chapter 10 for details.

2.8 Focalized clauses

When a normally postverbal NP or adverbial is focalized, it is moved to clause-initial (actually, pre-clausal) position. It is followed by à, which I

analyse as a (minimal) demonstrative in apposition to the focalized constituent. This à is treated as clause-initial, and is followed by any clitics that may be present. The à shows that the preceding element is a focalized constituent, as opposed to a pre-clausal topic NP. (17.a) illustrates non-subject focalization, (17.b) subject focalization. Brackets demarcate the core clause.

(17)   a.   àm-ɑn   [à   t-ərhá]
              water-MaPl   [Foc   3FeSgS-want.Reslt]
              'Water [focus] is what she wants.'

        b.   kæ̀mm   [à-\hi   ì-nhæy-æn]
              2FeSg   [Foc-\1SgO   3MaSg-see.PerfP-Partpl.MaSg]
              'It was you-FeSg [focus] who saw me.'

In subject focalization (17.b), the verb appears as a participle, and has 3MaSg agreement with à, regardless of the gender-number features of the focalized NP.

2.9 Relative clauses

Relative clauses must be subdivided in two ways. The first distinction is **subject** relatives versus **non-subject** relatives. The former are expressed with **participles** (specified as MaSg, FeSg, or Pl), the latter with regular inflected verbs (with occasional ablaut modifications).

The second distinction is between **indefinite** and **definite** relatives. In indefinite relatives, the **clause-internal head** is a simple noun, or a special indefinite demonstrative ì. In definite relatives, if there is a "head noun" it is outside the relative clause proper. The "head noun" is, however, followed by a definite demonstrative in apposition to it, e.g. MaSg w-á 'this', and this demonstrative functions as the clause-internal head. Any clitics are added to the clause-internal head.

Schematically, the four basic patterns can be illustrated as in (18).

(18)   Relative Clause Types

        a. indefinite subject relative
            [**man**(-\clitics) 3MaSgS-eat.LoImpfP-**Partpl.MaSg** dogs]
            'a man who eats [long imperfective] dogs'

        b. indefinite non-subject relative
            [**man**(-\clitics) see.PerfP-1SgS]
            'a man whom I saw [perfective]'

  c. definite subject relative
     man [**this-MaSg**(-\clitics) 3MaSgS-eat.LoImpfP-**Partpl.MaSg** dogs]
     'the man who eats dogs'

  d. definite non-subject relative
     man [**this-MaSg**(-\clitics) see.PerfP-1SgS]
     'the man whom I saw'

Here 'man' is external to the relative clause proper in the definite relatives (18.c-d), where the appositional demonstrative 'this-MaSg' is the clause-internal head. In the indefinite relatives (18.a-b), 'man' itself is the clause-internal head. In either case, the internal head is the host for any floating clitics within the relative clause.

Of particular interest is the fact that both participles (in subject relatives) and inflected verbs (in non-subject relatives) take special forms in definite relatives, due to a combination of special ablaut and accent rules. Specifically, a V-lengthening ablaut formative χ-pc1 that normally occurs in the Reslt and LoImpfP stems is erased in the participle or inflected verb of a definite (but not indefinite) relative. In definite relatives with a LoImpfP verb or participle, the syllable targeted by an accentual ablaut formative χ-pc1 is shifted one syllable to the right, or in one combination erased entirely, in definite (but not indefinite) relatives. These details show that accent and ablaut are sensitive to complex syntactic environments. This is the "interpenetration" of syntax and phonology referred to above.

2.10   Accent

As the preceding sections have hinted, accent is an important feature of Tamashek. However, its role is very different in verbs and nouns.

For inflected verbs and regularly formed participles, accent is not lexical. Except for the Reslt and LoImpfP stems, the accent is assigned by Default Accentuation, hence on the antepenult if there is one, otherwise on the leftmost syllable. Especially in the T-ka dialect, certain verbs have a non-default word-final accent in the short imperfective (including Sg imperative), but this is due to phonological rules triggered by Resyllabification of certain word-final CC clusters. In the Reslt and LoImpfP, however, all verbs undergo ablaut, which includes an accent formative χ-pc1 that assigns a marked accent to the first postconsonantal vowel (hence "pc1"). As noted at the end of the preceding section, the accent due to χ-pc1 may shift one syllable farther to the right, or may be erased entirely, in definite relative clauses.

For nouns (and other non-verb stems), accent is lexical. Some nouns have a lexical accent, others do not (and so undergo Default Accentuation). A lexical accent is only meaningful when the accent occurs, in the Sg and/or in the Pl, in a position where it would not be predictable from Default

Accentuation. In other words, to justify a lexical accent it is necessary to observe accent on the final or on the penult in a word, or in an accentual phrase (e.g. with preceding preposition), where Default Accentuation would have put the accent farther to the left.

Using x to represent a vowel, x́ indicates a marked (non-default) accent, either lexical (nouns), due to Resyllabification (verbs), or ablaut-induced (verbs). x̀ and x̰ indicate default accents. x̀ is an accent directly produced by Default Accentuation with no morphological complications, while x̰ is a special accent (on the penult, never the antepenult) whose position is affected by morphology, specifically by the presence of one of a specific set of suffixes and clitics. There is no phonetic difference between x́, x̀, and x̰.

2.11   Representation of stems

For nouns (and other non-verb stems), what you see is what you get. The Sg form of the noun is the citation form. Most Sg nouns (masculine or feminine) have a vocalic prefix, such as Sg -a- or -æ-, preceding the noun stem. A masculine example is a-bǽŋkor 'old well'. Feminine nouns also normally have a Fe prefix t-, and often FeSg suffix -t. An example is t-a-bə̀ŋŋən-t 'burrgrass'. The x̰ accent indicates that penultimate accent is predictable from the presence of suffix -t, which does not permit the usual antepenultimate default accent.

For verbs, the true citation form makes use of "v" for short vowel, "ʋ" for full vowel, and where appropriate more specific full vowels (usually u and i). If the verb takes Augment -t-, the formula "(+ -t)" is added. The PerfP or Imprt may be used as an informal citation form in some contexts (the PerfP is used as the headword in the dictionary). Examples of the true citation form are -vwvt- 'hit' (PerfP -ə̀wæt-), -ʋšvl- 'run' (PerfP -òšæl-), and -buffʋ- (+ -t) '(grain) be abundant' (PerfP -ə̀bbuffæ-t).

Verb classes (as opposed to individual stems) are represented as e.g. -vCvC-, -vPPvC-, and -vPQvC-. P and Q represent consonants, with PP a geminate cluster and PQ a nongeminate cluster. In other words, P and Q are indexes of identity among C's. The same class may be represented as e.g. -vCvC- or -vPvC- depending on context. For example, it may be stated that -vPvC- has a LoImpfP stem -əPPáC-, using P in -vPvC- in order to clarify the source of the geminate in -əPPáC-.

2.12   Ablaut

Ablaut (i.e. a procedure for audibly modifying stems) permeates Tamashek morpho-phonology and morpho-syntax. Perhaps the major ingredient in ablaut is a **vocalic melody** superimposed on the stem (whether the latter includes fully specified vowels, as with nouns, or mostly underspecified vowels, as with

verbs), consisting of L (low) and H (components). The melody is often combined with one or more **local ablaut formatives** that target and modify particular segments of the stem. Local formatives may geminate a C, may lengthen or accent a V, or may convert a specific V to a different V. The specifics of verbal ablaut are sensitive to the shape of the input stem.

Many nouns express Pl by stem-ablaut in combination with a change in vocalic prefix (and in some cases with a Pl suffix to boot).

Verbs use internal ablaut to generate the set of stems mentioned in §2.5, above. Some long imperfectives include a prefix -t- along with ablaut changes. Ablaut is also part of nominalizations (VblN, agentive).

As noted in §2.1 (form of verb in definite relative clauses) and §2.3 (Prefix Reduction of nouns in certain syntactic contexts), ablaut of a given word may be sensitive to its immediate syntactic environment (local dependency).

Normally, the **domain of ablaut** is the stem proper, excluding affixes. However, Prefix Reduction (which is as close as Tamashek comes to structural case-marking) is a kind of "ablaut" confined to vocalic prefixes on nouns. In addition, the ablaut domain of verbs with shapes like -v(C)Cʋ- is **extended up to the first C of a following subject suffix**. In the perfectives, this permits the verb stem plus (part of) the suffix to cobble together a v(C)CæC sequence of the sort required for audible expression of certain local ablaut formatives. I interpret this as a special rebracketing, bringing (part of) the suffix for this particular verb class (light V-final stems) into the domain of stem ablaut. For other verb stems, including light C-final stems, a suffix is never affected by ablaut, including stem-wide vocalic melodies.

Chapter 3
Phonology

3.1 Segments

3.1.1 Consonants

The positional series in the columns in (19) are listed in the key below the table. There are no pharyngealized ṇ, ḳ, ṃ, ḥ, etc., of the sort reported for Tamajak (Niger).

(19)   Consonant Phonemes

1.	2	3	4	5	6	7	8
(p)	t	((ṭ))	(č) = [tʃ]	k	((q))		
b	d	ḍ	j = [ɡʲ]	g			
f	s	(ṣ)	š = [ʃ]		x	(ħ)	
	z	ẓ	ž = [ʒ]		ɣ	(ʕ)	
m	n		(ñ) = [ɲ]	ŋ			
	l	(ḷ)					
	r						
w			y = [j]				
							h
							(ʔ)

key: 1. labial (bilabial stops, labiodental fricatives); 2. alveolar; 3. pharyngealized alveolar; 4. palatoalveolar; 5. velar; 6. uvular; 7. pharyngeal; 8. laryngeal

The singly parenthesized C's in (19) are marginal, confined largely to loanwords. The doubly parenthesized C's occur chiefly (though not exclusively) as geminated versions of other C's. Both types of C's are discussed in the following sections. The pharyngealized alveolars, along with the uvulars and pharyngeals, function as backing and lowering consonants (BLC's), see §3.1.2.2.

In the Kidal area, š can also be pronounced hʸ, i.e., as a palatalized aspiration. The K-f (i.e. Ifoghas) speakers I encountered who had this pronunciation alternated it with š, especially in elicitation sessions (where there awareness of the mainstream Tamashek š came into play). In any event, the hʸ remains distinct from the regular h phoneme. The Algerian counterpart is usually transcribed "h" in the literature, suggesting that true merger with

original *h has occurred north of the border. If so, the K-f pronunciation hʸ may represent a transition between *š and (Algerian) h.

Of comparative interest is the fact that original *h is alive and well in all normal C positions within stems. At stem-suffix (including stem-clitic) boundaries, h often functions as a kind of epenthetic C breaking up V sequences, though in a morphologically restricted manner suggesting that the h is part of suffixal allomorphs (§3.2.3.3, §7.4.3, §10.3.1-2). By contrast, in Tamajak (Niger) many cases of *h in stems have been zeroed, especially in final position, resulting in considerable morphological reshaping. See EPPB 61-135 for a historical analysis.

A major issue in Tuareg dialectology is variation between j (affricate [dʒ]) and g. The T-ka dialect, which is focal in this grammar, probably has the most extreme preference for j of any Tuareg variety, though g also exists as a phoneme. T-md is generally like T-ka in this matter. At the other extremity is A-grm, which has no j as all; it has g in all cases where T-ka has j. The remaining dialects covered here, including Im and R and the Kidal-area varieties, agree with T-ka most of the time but have g in a number of lexical items corresponding to j in T-ka. Example 1 (A-grm isolated): 'waterbag' = æ̀-ja (Im K-d R T-ka T-md) or æ̀-ga (A-grm). Example 2 (Timbutku dialects isolated): 'go' = PerfP -ə̀jla- (T-kd T-md) or -ə̀gla- (A-grm Im K-d K-f R). For historical background see EPPB 137-73.

3.1.1.1   Consonants of Arabic origin (ṣ ḷ ħ ʕ)

The segments ṣ, ḷ, ħ, ʕ, and ʔ (glottal stop) occur in Arabic loans. In my T-ka data, ħ and ʕ in loanwords are clearly distinct from x and ʁ, respectively. A minimal pair in T-ka is a-m-ǽlʕon 'accursed one' versus a-m-ǽlʁon 'worthless person'. However, in most other Tamashek dialects including T-md, R, A-grm, and K, Arabic ħ and ʕ in ordinary loanwords are merged with x and ʁ, respectively. Thus T-ka ælħádd versus other dialects' ælxádd 'Sunday'.

Glottal stop, which is already largely absent in local vernacular Arabic dialects, occurs only in carefully pronounced, unassimilated Islamic vocabulary and can be largely disregarded here. ṣ and ḷ are retained in Tamashek in a modest number of words. ḷ is mostly found in expressions containing the word for God (Allah), but also occurs dialectally in e.g. æḷærɔ́ra 'harm' where it represents Arabic *ḍ (Hassaniya Arabic, especially in Mauritania, has a lateral fricative for Classical Arabic *ḍ and *ð̣).

3.1.1.2 *Marginal nasals (ŋ ñ)*

The nasals ñ and ŋ occur in a handful of stems. A clear ñ was recorded in ñæmǽku 'frog sp.' for a Goundam-area speaker, and in kumæñǽga 'buprestid beetle'. These are probable Songhay borrowings.

ŋ occurs in ǽŋŋa 'brother', -vŋŋʋ- 'become ripe', and t-ùŋŋa-t-t '(type of) tree bark'. These three terms occur in Algeria and (with the possible exception of 'tree bark') in Niger, and so are unlikely to be borrowings, so prevocalic *ŋ can be assumed in a few words for proto-Tuareg. For 'brother' and 'become ripe' I have also recorded variants with ñ instead of ŋ in K: ǽñña 'brother', -vññʋ- 'become ripe'.

There are many cases of homorganic clusters ŋg, ŋk, and ŋɤ, but these can be taken as assimilations from /n g/, etc., since there are no oppositions between e.g. ŋg and ng.

3.1.1.3 *Uvulars (ɤ q)*

q is common as a phonetic entity but has marginal phonemic status. Most cases of phonetic [q] are in the geminated form qq, word-medially or -finally, and these can be interpreted as the phonetic realization of geminated /ɤɤ/. The conversion of /ɤɤ/ to qq is productive, and applies not only word-internally but also over word boundaries (§3.2.1.1).

Within words, we have cases of morphological gemination such as /i-əɤɤubb-æt/ > ì-qqubb-æt 'he gulped', cf. verbal noun à-ɤəbbu 'gulping'. At a nonprefixal morpheme boundary (with a suffix or clitic), qq often represents /ɤt/ or /ɤk/, as when a morpheme otherwise ending in ɤ is followed by a morpheme otherwise consisting of or beginning in t or k (e.g. FeSg -t, 3MaPl object clitic -t, or any of the pronominal clitics beginning in k). An example is the name of the language, /t-æ-mǎ:šæɤ-t/ > t-æ-mǎ:šæq-q 'Tamashek'; see §3.2.1.1 for more detail. In these cases, the effect is a bidirectional feature assimilation whereby the t or k adopts the uvular position of the ɤ while the latter adopts a voiceless stop articulation.

At word boundaries, we have such examples as preposition dæɤ 'in' plus any noun beginning in ɤ, e.g. dæɤ ɤúššæt 'in August', often pronounced [dæqːuˈʃːæt]. Another recurring combination is a verb ending in 1SgS -æɤ followed by particle ɤás 'only'.

While /ɤɤ/ is regularly realized as qq, there are hints that ungeminated q may be on the way to becoming a phoneme distinct from ɤ. This is because q as well as ɤ can occur in ungeminated position. While ɤ is much more common, there are some cases of q in Arabic borrowings, as in PerfP -əqbæl- 'consent' (imperative əqbəl, LoImpfP -qábbæl-, cf. noun ælqabála, all from Arabic qbl 'accept'). Contrast this with a native stem like -əɤbær- 'kick with heel' (Imprt əɤbər, LoImpfP -ɤábbær-). There are also dialectally sporadic cases of ungeminated q in non-borrowed vocabulary, especially where back-

formation from geminated qq may be involved. An example of internal back-formation is the verb 'sit' (§7.3.2.9), which often appears in the perfective or resultative stem, which involve gemination to qq (PerfP -æ̀qqimɑ-, etc.). For some speakers we also (by back-formation) get ungeminated q rather than ɣ in forms like Imprt qàyəm (variant qàm) alongside ɣàym, where I interpret the variants with q as influenced by the qq of the perfectives.

In the combination ŋɣ, often representing alveolar n plus ɣ, the ɣ approaches the stop articulation [q], or an affricated articulation that sounds like phonetic [qˠ]. The most common case is the verb 'kill', PerfP -ə̀ŋɣɑ-[-əŋqˠɑ-], but e.g. VblN t-è-næ̀ɣe with intervening vowel. I do not use "q" here in phonemic transcriptions, since I am not convinced that the segment in question is completely voiceless in this position; an instrumental phonetic study would be useful. No similar affrication occurs in mɣ, e.g. í-mɣɑd 'vassals' (Pl of ɑ-mə́ɣid).

While there is incipient phonemic splitting of q and ɣ, the alternation of ungeminated ɣ and geminated qq remains quite fundamental. For purposes of alphabetizing dictionary entries, I treat q as though ɣ (i.e. immediately following g).

3.1.1.4   Pharyngealized alveolar stops (ḍ ṭ)

The situation is somewhat similar with ṭ and ḍ. Here there are two types of alternation. First, there is a low-level and largely automatic devoicing of /ḍ/ before a voiceless obstruent. We can see this most clearly in cases like PerfP -ə̀ṭfɑ- 'be poured' (for /-ədfɑ-/) but LoImpfP -ḍáff-. However, I have recorded a few stems with ḍ instead of ṭ, e.g. PerfP -ə̀dkæḍ- 'describe'. The situation is particularly messy with the verb 'pick up' (§7.3.2.19), where we get variation between ḍk, ṭk, ṭk, and even kk, and some of this variation extends to the LoImpfP and VblN where a vowel intervenes between the alveolar stop and the k. Based on limited evidence, I suspect that the devoicing before voiceless obstruent is systematic when the obstruent is a fricative {f s š} and unreliable when the obstruent is a stop (k). There are no relevant cases where the obstruent is t (the clusters #ḍt and #ṭt do not occur stem-medially), there is no full-fledged p phoneme in the language, and I know of no example of ḍ clustered with following x.

Secondly, there are numerous alternations within a word family of phonetic geminated [ṭː], and ungeminated [ḍ], which suggest a single phoneme ḍ and a rule devoicing /ḍḍ/ to phonetic [ṭː]. An example is 'seize', with PerfP -ə̀ṭṭæf- 'seize, hold' but VblN úḍəf. However, on closer inspection, there turn out to be a fair number of cases where the geminated version of ḍ is [ḍː] rather than [ṭː]. The basic pattern is that we get [ḍː] when a stem-initial ḍ is geminated, and a mix of [ḍː] and [ṭː] in stem-medial position. See §3.1.1.8, below for details.

Because of the variation between [ḍ:] and [ṭ:] as geminated counterpart of ḍ, we must accept that ḍ and ṭ are partially independent of each other as phonemes. Moreover, there are a number of borrowings with ungeminated ṭ, e.g. VblN a-ṭə́lləʕ 'making a profit' (<Arabic). I will therefore transcribe with ḍ or ṭ based on pronunciation. In extracting consonantal "roots" for dictionary alphabetization purposes, I use the conventions summarized in (20).

(20)   "Root" Consonant Extraction Conventions for ḍ and ṭ

ḍ   a) for word-families that have at least one form with phonetic
            [ḍ]. Example: √ḍf 'seize, hold' because of VblN úḍəf.
        b) for word-families where the relevant consonant occurs
            only in [ṭX] clusters (where X is a voiceless obstruent),
            so at least arguably the [ṭ] is a /ḍ/ devoiced by a CC-
            cluster voicing assimilation rule.

ṭ   c) for word-families with [ṭ] in at least one form where it is
            ungeminated, and either prevocalic or before a voiced
            consonant. Example: ṭàbæl 'table'.
        d) for word-families with invariant geminated [ṭ:] with no
            direct evidence for /ḍ/. Example: t-æ̀ṭṭæl 'roasted meat'.

3.1.1.5   *Alternations of š and z and of š and zz*

The popular subdivisions of Tuareg (Tamashek, Tamajak, Tamahak) are named after the predominant reflex of *ž. Within the Tamashek dialects studied, there are some interesting synchronic variations of š with z (this section), and others of š with ž (§3.1.1.6, below). As noted in §3.1, š is pronounced hʸ in some Kidal-area dialects.

In (21), I list the stems known to me that vary subdialectally (sometimes with more or less free variation within a subdialect) between forms with š and forms with z, across most or all stems in the word-family.

(21)   Dialectal š/z Alternations

        a.   √šhr and √zhr 'be massive, well-fed'
        b.   √šj and √zj 'chase away'
        c.   √šjr and √zjr 'long, tall' (also √sjr)

For 'be massive' we get e.g. MaSg participle ("adjective") šuhǽr-æn or zuhǽr-æn. For 'chase away' we get e.g. PerfP -ə̀šæj- varying with -ə̀zæj-. For 'long, tall' we get e.g. MaSg participle šæjré-n varying with zæjré-n. In these word-families, the š variant is the more common overall. For 'long, tall' I have

also recorded √sjr (in variation with √šjr), perhaps a sporadic recent dissimilation of *š to the following affricatej [dʒ].

In the word-families to which we now turn, we get geminated zz corresponding to ungeminated š for at least some dialects (or speakers). This alternation is not "regular" phonologically, and all speakers have some other word-families with consistent š and šš, and some with consistent z and zz. Where zz does alternate with š, relatively stable zz typically occurs in forms whose relationship to š forms is of below average morphophonological transparency. The stable zz forms can be in short VblN's like áPPaC, áPP, and e-CǽPP, in long imperfectives of type -CáPP-, and in unsuffixed ablaut plurals of type t-i-Cɔ́PP (for Sg t-è-CæPe or t-è-CæPPe). There are also a few other idiosyncratic cases.

The alternations known to me, some confined to certain dialects (or speakers), are given in (22). Variant forms with šš instead of zz are given in parentheses.

(22)   Alternations of š and Geminated zz

	gloss	š form(s)	zz form(s)
a.	'be sold'	PerfP -ɔ̀nša-	VblN e-nǽzz
			LoImpfP -názz- (-nášš-)
b.	'pardon'	PerfP -ɔ̀nša-	LoImpfP -názz- (-nášš-)
		VblN t-è-næšše	Pl VblN t-i-nɔ́zz (t-i-nɔ́šš)
c.	'fly (insect')'	Pl èš-an (T-ka)	Sg èzz (éšš)
		[Pl also èzz-an, èšš-an]	
d.	'age-mate'	àši	verb zùyyə-t 'coincide' (Imprt)
e.	'butcher'	PerfP -òša-	VblN ázz (ášš)
f.	'run'	PerfP -òšæl-	VblN ázzal
g.	'niece'	Sg t-è-jæše	Pl t-i-gɔ́zz

For 'sell' (22.a) and its homonym 'pardon' (22.b), we get š when clustered with preceding n. When the sibilant is geminated (LoImpfP), we get zz varying with šš. The VblN e-nǽzz seems to have consistent zz. The VblN t-è-næšše 'pardon(ing)' has šš in spite of gemination, but zz varies with šš in the ablaut Pl.

For 'fly' (22.c) the sibilant is always geminated in the Sg (unaccented èzz, èšš, Ansongo Gourma accented éšš). The Pl, if formed by simple suffixation, retains this geminate (èšš-æn, èzz-æn). However, I also recorded a sibilant

alternation for Kal Ansar, i.e. Sg èzz but Pl èš-ɑn with ungeminated š (and full ɑ suggesting contraction from /eši-æn/, cf. feminine t-èzzi-t-t or t-èšši-t-t).

The relationship between the noun 'age-mate' and the verb 'coincide (in time)' in (22.d) is probably opaque synchronically. The noun itself was not recognized by some speakers and appears to be confined to certain dialects. The verb is cited in the Sg Imprt form zùyyə-t, but as with most C-initial stems it often appears in initially geminated stem shapes like PerfP -əzzuyyæ-t.

In (22.e-f), the sibilant is geminated in the VblN but not in any inflectable stem. The VblN of '(skin and) butcher' (e) varies between šš and zz, while that of 'run' (f) consistently shows zz.

For 'niece' (22.g), gemination occurs in the ablaut Pl, which has zz versus š in the Sg.

Fuller dialectal data on these stems are presented in the relevant dictionary entries.

3.1.1.6   Alternation of š and ž

The alternations covered here are lexically idiosyncratic.

For 'red, brown', I recorded forms with š throughout the word-family, e.g. Imprt ïšwaɤ 'become red!', MaSg participle šæggǽɤ-æn or šæ̀ggæɤ-æn 'red', and abstractive noun t-ə̀-šuɤe 'redness'. However, I did record a relative adjectival noun as á-žwaɤ 'red one' with ž.

For 'be wondrous', I recorded forms with consonantal sequences √ššb and √žžb, e.g. PerfP -æ̀šošæb- varying with -æ̀žožæb-. These forms are borrowed from Arabic √ʕžb.

3.1.1.7   Alternation of w and gg

There is an alternation of single w with geminated gg. It is not fully productive, and except when solidly lexicalized (e.g. verbal nouns) the tendency is to level it out, the usual result being w and geminated ww.

In verbal inflection, I observed no cases of gg due to gemination of stem-initial w in the PerfP or ShImpfP stems: Imprt wæ̀llæf 'invent' and PerfP -ə̀wwəlæf- (not #-ə̀ggəlæf-). Likewise, the PerfP type -æ̀wwæC-, e.g. -æ̀wwæɤ- 'keep back', has ww instead of gg. One could argue for -òwæC- as the basic PerfP stem for such verbs, since in all imperfective stems they are treated like verbs with PerfP -òPæC- (with P other than w).

However, in the LoImpf of -vwvC- verbs, gg (probably the original treatment) is attested in variation with leveled-out w w, hence ə̀wət 'hit' (Imprt), LoImpfP -(t-)əggát- alongside -(t-)əwwát-. The same is true of -vCwvC- verbs: PerfP -ə̀šwær- 'precede', but LoImpfP (with medial gemination) -šáwwær- or -šággær-.

The most systematic retention of gg as geminated version of w is in verbal nouns. The -òwæC- verbs just mentioned with PerfP -æ̀wwæC- have a VblN pattern ággaC (ággal, ággaḍ, ággaɤ), never #áwwaC.

The verb for 'become red, brown' has PerfP šæ̀ggaɤ- (and its participles), Imprt ĭšwaɤ, and LoImpfP -t-ĭšwaɤ-. Related nouns are á-šwaɤ (or á-žwaɤ) 'red one' and t-ə̀-šuɤe 'redness' (perhaps <*t-ə̀-šəwɤe).

In nominal Sg/Pl alternations, I can cite a word for 'tail or mane hair' (also 'grey heron'): Sg ǽ-šaw or ǽ-šaww, Pl ĭ-šagg-æn or ĭ-šaww-æn. There are also some archaic w/gg alternations in the following terms for affines: a-ḍǽggal 'father- or son-in-law', Pl ĭ-ḍəwl-an ; a-lə́ggəs 'brother-in-law', Pl ĭ-ləws-an.

For historical discussion of this problem in Berber, see EPPB 42-4.

3.1.1.8   Alternation of ḍ and ṭṭ

Geminated /ḍḍ/ is sometimes devoiced to ṭṭ (phonetic [t̤ː], resulting in alternations of ḍ with ṭṭ.

In verbal inflection, we observe the alternation between inflectable stems of type - vCCvC- and their nominal derivatives. Example: 'hold' has inflectable stems -ə̀ttæf- (PerfP), -ə̀ttəf- (ShImpfP), and -t-áttəf- (LoImpfP), but VblN úḍəf and Agentive ə-n-úḍəf. The nominal derivatives (VblN, Agentive) are somewhat lexicalized, but the alternations do point to a correspondence between ungeminated ḍ and geminated ṭṭ. Taking /ḍ/ as underlying, we could argue that geminated /ḍḍ/ in the inflectable verb forms has been devoiced to ṭṭ.

In the case of 'hold', the division is between the inflectable verb stems as a class (with ṭṭ) and the associated nominals (with ḍ). However, when the simple/geminated alternation occurs within the set of inflectable verb stems, i.e. when the gemination is confined to the long imperfective, we get ḍḍ instead of ṭṭ. An example is 'graze', with PerfP -ə̀ḍæn- and LoImpfP -t-əḍḍán-.

Let us now consider cases where the inflectable verb stem has ungeminated ḍ and a nominal derivative has a geminated counterpart. In these cases, we get ḍḍ rather than ṭṭ. Thus -òḍæn- 'be missing', VblN íḍḍun. Comparison of e.g. -t-áttəf-, -t-əḍḍán-, and íḍḍun shows that both ṭṭ and ḍḍ can occur stem-medially. I conclude that the choice requires reference to morphology and does not constitute a pure phonological process.

The other relevant alternation involves stem-initial ḍ in verb classes where a stem-initial C is geminated in certain stems including the PerfP (but not the Imprt or the long imperfectives). An example is 'become angry', with PerfP -ə̀ḍḍukræ-t alongside LoImpfP -t-íḍəkru-t. Note that the geminated form is ḍḍ rather than ṭṭ.

The data can be summarized in (23).

(23)   Geminated Counterpart of ḍ

      ḍḍ   a) inflectable verb stems have medial ḍ and ḍḍ.
                 b) inflectable verb stems have initial ḍ and ḍḍ
                 c) inflectable verb stems have medial ḍ, nominals have ḍḍ.

      ṭṭ   d) inflectable verb stems have ṭṭ, nominals have ḍ

I infer from these data that the cases of ṭṭ alternating with ḍ are the odd man out. It is reasonable to think that devoicing of /ḍḍ/ to ṭṭ was productive at an earlier stage of the language, that the currently productive rule is that ḍ is geminated to ḍḍ, and that devoicing remains operative as a morphologically specialized process in alternations where ṭṭ is well-established. Assuming that the directionality of derivation is verb (input) to nominal (output), the cases of ṭṭ (verbs) corresponding to ḍ (nominals) have not been "updated" to conform to the currently productive rule because the nominals have only weak influence on the associated verbs. By contrast, where the verb has ḍ, the nominals have been updated. Likewise, any alternations of medial ḍ and *ṭṭ among the different inflectable stems of a verb have been leveled out by updating *ṭṭ to ḍḍ.

3.1.1.9   Loss of stem-final semivowel

There are numerous, but mostly rather lexicalized, alternations between final w or y and zero, suggesting that original stem-final semivowels have been lost in some forms. For some stems, this can be seen in **masculine/feminine alternations**, where the stem has a final semivowel before FeSg -t but not in the unsuffixed masculine, as in æ̀-jola 'step-son' versus t-æ-jŏlay-t 'step-daughter', and à-jæya 'great-grandson' t-a-jæ̀yaw-t 'great-granddaughter'. Another pattern where the unsuffixed masculine is missing a V in addition to the missing final semivowel is é-bæɲɣ 'floodplain', feminine (=diminutive) t-e-bæ̀ɲɣæw-t. Fuller lists of these types are given in §4.1.2.4.
    Two noun stems whose Sg ends in oy are attested at least dialectally with ablaut plurals irregularly lacking the y (24).

(24)   Ablaut Plural without Stem-Final y

	gloss	Sg	Pl
a.	'carrion'	t-a-mæ̀sɣoy-t	t-ĭ-məsɣa
		[similarly in Niger Tamajak, LTF2 124]	
b.	'(little) penis'	t-a-ʐæ̀mboy-t	t-ĭ-ʐəmba
			[Pl also t-i-ʐə́mbay]

There are some (sub-)dialectal variants such as é-kew and é-ke for 'root', and áfrew versus áfærr 'wing', where one variant shows final w. In à-læššo and variant à-læššæw 'black turban cloth', æw varies with o. Likewise ággu 'griot' (regional word) varies dialectally with ággiw.

Among verbs, note such pairings as -òlæh-'resemble' and related noun m-îlhɑw 'resemblance', and the intraparadigmatic variation seen in PerfP -æffo- (dialectally -æffew-) and Imprt ïfɑw for '(day) break'. For more detail on '(day) break' see §7.3.2.15.

The largest set of alternations of final zero with semivowel are **nominal plurals** that involve both a suffix (MaPl -æn or -ɑn, FePl -en) and a stem change. One pattern typical of certain types of VblN, especially Sg type úCəC, and some other nouns, is exemplified by úḍəf 'holding', Pl ùḍfɑw-æn (see §4.1.2.10). Here one could argue that the w serves to separate the ɑ of the stem from the suffix-initial V. However, the productive device for avoiding a vowel cluster in this position is to use a postvocalic allomorph of the Pl suffix, e.g. MaPl -tæn instead of -æn. The addition of w just before a Pl suffix like MaPl -æn is often accompanied by other idiosyncratic stem changes, such as the extra ɑ in ùḍfɑw-æn (compare Sg úḍəf), or the broader ablaut seem in e.g. è-bæje 'horse', Pl ì-bəjw-ɑn. I therefore take the w in ùḍfɑw-æn (and ì-bəjw-ɑn) to be part of the stem rather than part of the suffix or an epenthetic linker. As a result, I recognize more cases here of stem-final w confined to the plural.

There are many nouns that end in phonetic [i] or [u] in the unsuffixed masculine singular. [i] can represent phonemic /əy/ or /i/, and [u] can represent /əw/ or /u/. The following tests for distinguishing diphthongal from monophthongal representations are available: a) adding a 1Sg possessive suffix, which is -in after C but -nin after V; b) adding a V-initial suffix like MaPl suffix -æn, which is normally extended to -tæn after V but not after C; and c) if there is an unsuffixed ablaut plural, /i/ and /u/ should be replaced by ɑ, /əy/ by ɑy, and /əw/ by ɑw. As it happens, the data from these tests are often inconsistent, even for single speakers. Most often, singular nouns ending in [i] or [u] are treated as V-final when a **pronominal possessor** suffix is added, so we usually get postvocalic 1Sg allomorph -nin, though postconsonantal allomorph -in is occasionally attested. Some of these same nouns consistently form ablaut or suffixal **plurals** that presuppose final /əy/ or /ə w/ in the singular. All the verbal nouns of the heavy verb stems ending in ...əy and ...əw are of this type, e.g. VblN ɑ-fləwfə́lə w [ɑflufə'lu] from (PerfP) -æflæ̀wfælæw- 'flicker' (1Sg possessve ɑ-fləwfəlǔ-nin, much less often ɑ-fləwfələ̂w-in, but plural consistently ɑ-fləwfə̀liw-æn). There are also a number of simple nouns like æ-bóri 'stick' of this type, though for these nouns the singulars are more consistently treated as V-final (1Sg possessive regularly æ-borî-nin, but plural i-bòrəy-æn).

One way to analyse the differential effect of a pronominal possessor suffix and a Pl formation (ablaut or suffixal) is to argue that plurals take shape at an

early (perhaps lexical) cycle, while possessor suffixes are added at a later (perhaps postlexical) cycle.

3.1.1.10   Loss of nonfinal semivowel

Nonfinal stem-consonant w is lost, or alternates with homorganic vowel u, in certain forms of the adjectival word-families √šwɤ 'red, brown', √wrɤ 'yellow, light brown', and √wšr 'big'. In (25) I show the PerfP and Imprt of the verbs ('become X'), the associated noun ('an X one'), and the abstractive ('red/yellowness').

(25)   Presence/Absence of w in Certain Adjectival Stems

	PerfP	Imprt	noun	abstractive
a. 'red'	šǽggaɤ	ɪ̌swaɤ	á-šwaɤ	t-ə̀-šuɤe
b. 'yellow'	-ǽraɤ-	ɪ̀wraɤ	á-wraɤ	t-ǽ-roɤe (t-ə̀-ruɤe)
c. 'big'	wǽššar	ɪ̀wšar	—	t-ù-šǽre
		[Imprt also ùšar (A-grm)]		

'Yellow' lacks w in the PerfP. In Niger, this stem has dialectal forms based on √rwɤ instead of √wrɤ (LTF 2 282), suggesting that metathesis has played a role.

The abstractives for 'red' and 'yellow' in (25) show o or u instead of w. Note also the Imprt variant ùšar for A-grm.

Nonfinal stem y is lost in the (Timbuktu-area) Pl òr-æn or òr-an 'months' for Sg íyor (or ǽyyor). The unreduced Pl ǽyyor-æn was recorded in A-grm. (Some dialects, e.g. those around Kidal, use an unrelated stem for 'month'.) A stem meaning 'grass' is variably t-é-yšše (Pl t-i-yǎšiw-en) or t-éšše (Pl t-ǎššiw-en). The stem t-à-yətte 'mind, intelligence' has a variant Pl t-ɪ̃-tw-en (alongside the more regular Pl t-i-yə̀tta-w-en). The i in t-ɪ̃-tw-en might be taken as the usual Pl prefix -i-, but it could alternatively be taken as a vocalized version of the lexical y, or as the contraction of /iy/.

The dialectal alternation ælɤáfəyæt and ælʕáfet 'peace' (<Arabic) is a little different since it involves contraction rather than just monophthongization.

There are a handful of alternations like ællǽwɤ-æt and ællóɤ-æt 'language' (<Arabic), involving æw varying with o. The stems are loans or regional words. It is not immediately clear whether the variants reflect multiple borrowing, or whether the monophthongal variants have evolved out of the diphthongal ones.

3.1.2   Vowels

3.1.2.1   Full and short vowels

The vowel phonemes are the short V's in (26) and the full V's in (27).

(26)   Short Vowels

high:	ə
low:	æ

(27)   Full Vowels

high:	u	i
mid-height:	o	e
low:		ɑ

The **short V's** do not occur word-finally. All seven V's occur in closed syllables, in nonfinal open syllables (though ə is syncopated in some contexts), and word-initially before a C. Some neutralizations occur before BLC's (see §3.1.1.2, below).

All of these V's occur as distinct phonemes word-initially and word-medially. All may occur in either open or closed syllables, though under some conditions medial interconsonantal ə is subject to syncope. Word-finally, only full V's occur. The high (H) and low (L) V's constitute sets in ablaut patterning; note in particular that ə patterns with {u i} while æ patterns with ɑ. The mid-height V's are largely outside of the H/L system, but behave like low V's in the environment for Short-V Harmony.

The difference between short and full V's is entirely unrelated to accent. The Default Accentuation rule is based on syllable counts, regardless of how "heavy" the syllable is.

The only phonemic opposition expressed primarily by length is æ (=short a) versus ɑ (=full or long a). Duration is not the only cue, however; the phoneme æ varies phonetically from (short) [æ] to (short) [ɑ] depending on consonantal environment, while the phoneme ɑ is realized as [ɑː] with little variation in quality. A pair illustrating æ versus ɑ is ǽ-kɑlɑ 'rope for pulling camel' versus à-kælɑ 'moist flesh (of melon)'.

Since the sets of short and full V's are not parallel, it is not really necessary to use macrons for the full V's, e.g. ē and ā. Such transcriptions, however, are reasonable structurally.

I use the symbol "æ" for short a, and "ɑ" for full (long) a. For Niger Tamajak, LTF2 used "ă" and "a," respectively. For Mali, DN86 uses "ă" and "a". My choice is designed to make the two symbols more clearly distinct. Furthermore, by avoiding the micron (i.e. breve diacritic) in the symbol for

short a, I am able to add accent markings (ǽ, æ̀, etc.), which are generally not used by the other authors.

3.1.2.2   Vowels before backing and lowering consonants (BLC's)

The consonants {r q ɣ x ʕ ħ}, all pharyngealized alveolars {ḍ ṭ ḷ ṣ ẓ}, and to some extent h, hereafter "**backing and lowering consonants**" (abbreviation: **BLC's**), have the effect of lowering preceding high full V's and of backing and lowering short V's. In T-ka, this is systematic and results in surface mergers of vocalic phonemes, provided that the BLC is syllable-final. When the BLC is not syllable-final, there is still a notable backing or lowering effect, but complete phonemic merger does not always occur (in such cases, my field transcriptions are variable).

The mergers, in phonemic terms, are those in (28).

(28)   Backing/Lowering of V's

short V: ə > æ
full V's: i > e   u > o

That is, schwa is backed to merge with the æ (i.e. short a) phoneme, while high full V's are lowered to mid-height.

In addition to inducing these vocalic mergers, BLC's also affect the phonetic realization of the resulting {æ e o}. The merged æ (=short a) is pronounced [a]. This applies both to true /æ/, and to underlying /ə/ that has lowered to merge with /æ/. Similarly, before a BLC, e (either true phonemic /e/, or lowered /i/) is realized as [ɛ], while o (either true /o/ or lowered /u/) is realized as [ɔ].

For the short V's, compare e.g. PerfP -ə̀fla- 'be split' with PerfP -ə̀ʕma- [-aˈʕma-] 'apply henna', using verbs of the same class. For i > e, compare nominal MaPl forms i-klə̀stif-æn [ik...]'chatterings' and î-ɣbab [ɛˈɣ...] 'holes in tree' (both of which contain MaPl prefix i-). For u > o, compare the infinitives (of the same verb class) újə̀š [uˈdʒəʃ] 'entering' and úɣəl [ɔˈɣəl] 'waiting'.

Backing/Lowering also occurs before certain **PQ clusters** where Q is a backing and lowering C while P is a C (usually a liquid or nasal) that **passively transmits** the effect to a preceding V.The attested clusters of this type are /lḍ/, /lẓ/, /nḍ/, /mḅ/, /mḍ/, /ŋɣ/, /mẓ/, /nẓ/, and less systematically /bḍ/. Examples: -ə̀ldæš- [-aˈldæš-] 'become tired', -ə̀lẓa- [-aˈlẓa] 'shave', ə̀nḍəw [aˈnḍu] 'throw!', t-ə̀mḅe [tɛˈmḅe] 'taste' and variant t-ə̀mḍe [tɛˈmḍe] 'taste', /ənɣa-æɣ-\t/ > ə̀nɣe-q-\q [aˈnɣɛqː] 'I killed him', -t-îm-ẓ-əẓẓij- [-tɛˈmẓ...] 'pull each other', ə̀nẓəj [aˈnẓəj] 'blink!', and for some speakers i-bḍa/ [ɛˈbḍa] 'he was separated'. I did not observe this treatment with ɣ (q, ʕ) after l or m, e.g. əlqəbîl-æt 'tribe'.

The short-V merger is potentially momentous, given the importance of the ǝ versus æ opposition in verbal ablaut. In verbs of the shape -vCCvC-, for example, the PerfP stem is -ǝCCæC- while the ShImpf stem is -ǝCCǝC-, and if the final C is a BLC this aspectual distinction is phonetically neutralized. The stem-initial ǝ of this and many other verb types is also subject to backing, if the first C of the stem is a BLC. With a stem-initial short V, however, we can test for underlying /ǝ/ versus /æ/ status by adding 3MaPl subject prefix i-, which combines with stem-initial /ǝ/ as i- (surfacing as [e] after Backing/Lowering) but with stem-initial /æ/ as Ø-æ. In many other cases there is no such test, but particularly in verbal morphology it is usually possible to choose between underlying /ǝ/ versus /æ/ by comparison to forms of the same pattern with verbs with plain C's.

In my normal transcription, I attempt to **undo the effects** of Backing/Lowering, restoring original ǝ, i, and u where possible. Most Tamashek stems belong to recognizable patterns with characteristic vocalic patterns (often reflecting ablaut melodies). This is true of all verb forms (except the perfective stems of some verbs of adjectival quality). It is also true of ablaut and mixed suffixal-ablaut nominal plurals, and of some singular nouns. However, there are some nouns, prepositions, adverbs, and perfective verbs of adjectival quality (these perfectives are noun-like in form), whose underlying vocalism cannot be reliably determined on the basis of such class analogies. If such stems have BLC's, there may be no basis for deciding between phonemic /i/ and /e/, /u/ and /o/, or /ǝ/ and /æ/. In such indeterminate cases, I transcribe the vowel as it is heard phonetically, i.e. as æ, e, and o. Examples: preposition [ɣɔr] 'chez' transcribed ɣòr (not ɣùr), adjectival verb PerfP [ka'rːoẓ] 'it became narrow' (where both r and ẓ are BLZ's) transcribed kæ̀rroẓ, though the transcriptions ɣùr and kǝ̀rruẓ are equally compatible with the phonetic output and are not ruled out by any morphological pattern.

Because of these indeterminacies, my transcriptions of vowels before BLC's should be used with caution in reconstructions of proto-vocalism. The Tamajak dialects of Niger seem to have the most conservative vocalism, since BLC's do not seem to produce phonemic mergers in those varieties. I have not done enough careful work on eastern Tamashek (A-grm, Gao, Kidal) to be completely sure of the situation there. There is certainly some merging of vowels before BLC's but the mergers are perhaps less rigorous than in T-ka.

3.1.2.3   Deletable final vowels (nouns, suffixes, clitics)

Even without comparison to other Tuareg and Berber varieties, there are indications in the morphology that original stem- or word-final vowels have been lost. In some cases, a good case can be made for a lexical representation with some kind of final V that is subject to deletion in word-final position.

First, some suffixes like FeSg -t behave, for purposes of Default Accentuation, as though they ended in a vowel: ɑ-bæ̀mbærɑ 'Bambara man'

but feminine t-ɑ-bæmbæ̀rɑ-t-t 'Bambara woman' (or 'Bambara language'). The Default Accentuation rule normally depends only on the vowels, producing an antepenultimate accent on multisyllabic words lacking a lexical accent on the final or the penult. The addition of suffixes consisting entirely of C's should not change the accent, but the 'Bambara' examples above show that FeSg -t does force the shift of a default antepenultimate accent onto the penult. For fuller discussion of this and other suffixes and clitics with similar accentual effects, see §3.3.1.1.

There are a few noun stems that appear to preserve an original final vowel before FeSg -t (actually -t-t with additional inner Fe suffix), but not in the unsuffixed masculine singular. For 'gazelle' we have male e-dǽm versus female t-e-dæ̀mi-t-t. For 'noble (freeborn)' we have male e-lǽll and female t-e-læ̀lli-t-t, cf. verb -ə̀llullæ-t 'be noble' and abstractive ə̀lləllu 'nobility, freeborn state'. See §4.1.2.4 for fuller data.

A number of V-final noun stems have a MaPl suffix -ɑn with full vowel, instead of the usual MaPl suffix -æn. In some cases the full V is due to ablaut (/-æn/ plus x̧), but in other cases it is due to contraction with a stem-final V (/V-æn/→ -ɑn, see (39)). Examples of the contraction type are ɑ̀-kæsɑ 'fresh vegetation', Pl i-kǽs-ɑn ; and e-kǽši 'speckled one', Pl i-kǽš-ɑn. The accent shift in the first example, from prefix (in the singular) to the surface penult (in the plural), reinforces the view that these cases of surface -ɑn suffix result (at least historically) from contraction of a stem-final V with /-æn/. If Default Accentuation applies to /i-kæsɑ-æn/ prior to VV-contraction (39), the accent is on the underlying antepenult as expected, though after contraction this ends up as the surface penult. See §4.1.2.13 for more data and analysis.

Another set of nouns, including one important verbal noun pattern, have an apparent Pl ending -ɑwæn that I interpret as a stem-final ɑ (missing from the singular) plus an epenthetic stem-extension w- plus MaPl suffix -æn. Example: éff 'shelter', Pl èffɑw-æn.

A somewhat more complex case of stem-final V alternating with zero is discussed in the next section.

3.1.2.4   Stem-Final ɪ/A-Deletion (in verbs)

A number of verbs have stem-alternations involving full V's, short V's, and zero. These are the only unaugmented V-final verbs. For example, 'vomit' has a PerfP -ə̀bsɑ-, with 3FePl subject ə̀bsæ-næt 'they-Fe vomited'; I take its basic lexical form to be -vbsʊ-. The ShImpf is -æ̀bs (e.g. Sg Imprt æ̀bs 'vomit!') without the final V. The ShImpf combines with 3FePl subject suffix -næt as ə̀bsə-næt, with a stem-final ə that also induces an assimilatory (i.e. harmonic) change of stem-initlal /æ/ to ə. It also combines with 3MaPl subject suffix -æn to give ə̀bsə-n. I take the basic (lexical) form of the ShImpf to be /-æbsɪ-/, ending in an underspecified high V "ɪ" that is deleted without trace word-finally (i.e. where no subject suffix appears). The /ɪ/ contracts with the /æ/ of a

following V-initial subject suffix to form ə, in effect transferring its [+high] feature to the surviving short V. The /ɪ/ surfaces as ə before C-initial subject suffixes like 3FeSg -næt.

A good case can be made for a parallel underspecified and deletable low V that I write /A/. This occurs only in long imperfectives of a subset (namely, bisyllablic -vCCʋ-) of the same V-final verbs that have /ɪ/ in the short imperfective (preceding paragraph). The LoImpfP in question appears as -PáQQ word-finally (i.e., with no subject suffix), as in -báss 'vomit'. However, when a C-initial subject suffix is added, we get forms like 3FePl bássæ-næt with a stem-final low V, and this is the main evidence for a representation of the type /-bássA-/. When a subject suffix beginning in æ is added, we get forms like 3MaPl bássæ-n, which could be generated with or without a stem-final /A/, but which I take (by parallelism to the short imperfectives) as due to contraction, i.e. /bássA-æn/ with the /A/ transferring its [-high] feature to the surviving contracted V. In sum, the evidence for /A/ is weaker than that for /ɪ/, and /A/ occurs in the paradigms of a subset of the stems that have /ɪ/.

For more on these unaugmented V-final verbs see §7.3.1.3.

Both final /ɪ/ and /A/ in these verbs correspond to "u" in the corresponding forms of Niger Tamajak (LTF2 424, class I.A.7-11,e.g. Imprt "ăḳnu" and LoImpfP "iḳannu" for 'do well'). However, Foucauld's data do not have a final V in such forms as "ilâss" for 'he dresses' (DTF 4.2020) and "ed iken" for 'he will do well' (DTF 2.821).

Synchronically in Tamashek, one might equate stem-final /ɪ/ with ə, and /A/ with æ, noting that {ə æ} do not otherwise occur as stem-final segments. However, these equations are not transparent, and the fact that the verbs in question have stem-final full V's in the perfective and long imperfective stems makes it difficult to justify short-vowel representations for /ɪ/ and /A/. No other stems or words in the language end with short V's.

If we were to identify /ɪ/ and /A/ with full V's (the only V's that otherwise occur in stem-final position), /ɪ/ should probably be identified with i rather than with u. This is because there are some verb classes with a non-deleting final u, either in the imperfective forms only or in both perfective and imperfective stems. For example, the verb 'cough' appears as -ə̀su- in both PerfP and ShImpf stems (§7.3.1.4). This u does not delete word-finally, and contracts with /æ/ at the beginning of a subject suffix to form u rather than ə, as in ə̀su-n 'they-Ma coughed' from /əsu-æn/. This true stem-final u therefore has no phonological similarity to /ɪ/. However, there is only one verb with true i in the ShImprt stem, namely -ïwi- 'be born'. Since this verb has a /-iCi-/ shape not found with any of the verbs that I analyse as having final /ɪ/ in the ShImpf (and /A/ in the LoImpfP), one could imagine identifying /ɪ/ with i and trying to connect the phonological differences in some way with stem shape. However, again this is a somewhat convoluted argument, and I prefer to think of /ɪ/ and /A/ as abstract segments with vowel-like properties.

The deletion rule may be formulated as (29).

(29)   **Stem-Final ɪ/A-Deletion (Verbs)**

> Stem-final underspecified vowels /ɪ/ (high) and /A/ (low) are
> deleted when not followed by a nonzero subject suffix

The nonzero suffixes expressing imperative subject (MaPl -æt, FePl -mæt)
do not count as "subject suffixes" for this purpose and do not block the
deletion (§7.2.3.2).

When deletion of /ɪ/ produces a word-final CC cluster, depending on
which C's are involved it may be necessary to resyllabify by inserting a schwa
between the two. In T-ka this also entails an accent shift onto the schwa. See
§3.2.4 and §3.3.2 for details.

3.1.2.5 Phonological status of final [u] and [i]

Because word-final (or preconsonantal) u and ə w (phonetic [u]) are
indistinguishable, as are i and əy (phonetic [i]), clues from suffixation and
ablaut may be relevant to determining the correct phonological representation.

For nouns, a true final u or i will become ɑ in a nonsuffixal ablaut plural,
since Pl ablaut replaces the last V of the stem by ɑ. By the same token, a stem-
final əw will become ɑw in an ablauted Pl, and əy will become ɑy.

    We observe u to ɑ in æ̀-kɑrfu 'rope' (<Songhay), Pl ì-kurfɑ, and
t-ɑ-dɜ̀ɤnu-t-t 'millet beverage', Pl t-ì-dɜɤnɑ. I know of no example where Sg
stem-final u corresponds to Pl ɑw, though the irregular compound initial mɜ̀ssi
'owner of', Pl mæ̀ssɑw- 'owners of' (§4.1.2.26), is suggestive. Examples
where final /i/ is replaced by Pl ɑ include: t-ɑ-tbɜ̀qqi-t-t 'dot', Pl t-ì-tbɜqqɑ,
and t-ɑ-ɤ̀ìmi-t-t 'sitting' (VblN, √ɤym), Pl t-ì-ɤimɑ (A-grm). Examples where
the Pl has ɑy include t-ɑ-s-ɜss-ɑ̀wi-t-t 'package' (A-grm), Pl t-i-s-ɜ̀ss-iwɑy,
and t-ɑ-s-ɜ̀nji-t-t 'channel', Pl t-i-s-ɜ́njɑy. These Pl forms justify e.g.
/-tbɜqqi-/ for 'dot' with final i, and /-s-ɜss-ɑwəy-/ for 'package' with final əy,
as the representations to which Pl ablaut applies. Further examples of ablaut
plurals can be gleaned from the lists in the sections beginning §4.1.2.15. Many
of the relevant nouns are derivatives of verbs, where the difference between
final diphthong (vy or vw) and final vowel (ʋ) is clearly expressed in verbal
inflection. Thus t-ɑ-s-ɜss-ɑ̀wi-t-t 'package' is a derivative of the Causative of
-ʋwvy- 'bring' (PerfP -æ̀wwæy-).

    While the plural-ablaut test suggests singular representations for 'package'
and 'channel' (preceding paragraph) ending in /...əy-/, the Sg forms end in -t-t,
including inner Fe suffix -t-. This suffixal pattern is otherwise confined to
V-final stems, so the different pieces of evidence conflict. One might conclude
from this that ablaut applies at an early (lexical) stage, while FeSg suffixation
applies to later (post-lexical) representations.

    Suffixal plurals (without ablaut) also provide evidence for the status of
final [u] and [i] in singular noun stems. If the noun ends in a true V, we

frequently get -tæn, as in Sg à-dwənni 'talk (noun)', Pl i-dwə̀nni-tæn. If the noun ends in /əy/ or /əw/, we get just -æn without the (intervocalic epenthetic) -t-, and the semivowel is audible: ...əy-æn, ...əw-æn. An example is æ-bóri 'stick', Pl i-bòrəy-æn. The two stems can therefore be assigned lexical representations /dwənni/ and /borəy/, respectively. However, the Sg type æ-bóri behaves like a V-final (not C-final) stem for purposes of assigning allomorphs of possessive pronominal suffixes. Thus æ-borì-nin 'my stick', with postvocalic allomorph; we would expect #æ-borə̀y-in with postconsonantal suffix allomorph if the stem were treated as ending in a semivowel. So again, there are data pointing in opposite directions, perhaps lending themselves to a distinction between lexical and postlexical rules.

The type æ-borì-nin seems to be quite regular for nouns of this type. For common nouns, the only evidence available to the native speaker that [u] is from /əw/ or that [i] is from /iy/ is the form of the plural, and evidently this is not powerful enough to influence the suffixal allomorphy of the singular. However, verbal nouns are somewhat different, in that they are closely associated in form with inflected stems. Thus the VblN 'expressing thanks', phonetic [ɑ-dʒɔ'ḍi], can be safely assigned a representation ɑ-júḍəy rather than #ɑ-júḍi since the corresponding verb (PerfP -jòḍæy-) has an unmistakable final diphthong. If this isn't enough, verbal nouns ending in ...CəC have a variant with full ɑ instead of schwa, in this case ɑ-júḍay alongside ɑ-júḍəy. The representation ɑ-júḍəy is confirmed more directly by its own Pl i-jùḍəy-æn (varying with i-jùḍay-æn). However, here there is some fluctuation in the data, and plurals of the type i-jùḍi-tæn are attested (rarely) along with those of the types i-jùḍay-æn and i-jùḍəy-æn.

The situation may be summarized as follows. For common nouns, the plural (ablaut or suffixal) may require a stem representation ending in a diphthong /əy/ or /əw/, but even in this case the Sg may behave as V-final for purposes of its own suffixal allomorphy (which arguably involves post-lexical processes). With verbal nouns, where the evidence for a final diphthong is much more visible to native speakers, the Sg VblN is often (but unreliably) treated as diphthongal.

3.1.2.6   Phonological status of medial [u] and [i] before C

Most cases of medial [u] and [i] are unproblematically assigned to u and i phonemes. However, there are some cases where I transcribe them as diphthongs, əy or əw. The stems in question have ablaut alternations of the type æw versus [u], or æy versus [i]. For example, the verb 'dust off' has a ShImpf stem kæ̀ykæy [kæ'jkæj], and a PerfP stem [ə'kːikæj] that I transcribe -ə̀kkəykæy-. Likewise ShImpf læ̀wlæw 'tower (above)' and PerfP [ə'lːulu], the latter transcribed -ə̀lləwləw-.

For the irregular verb 'sit' (√ɤym or √ɤm), the most common forms are of the perfective stem family, e.g. PerfP [-æqːimɑ-] (for T-ka, the [æ] is a backed

realization of /ə/, harmonic to i, before a BLC, but for other dialects it is a true initial æ). The ShImpf is dialectally variable, e.g. Sg Imprt ɣàm (qàm) versus ɣàyəm. This variation suggests competing analyses of the perfectives, as either -ə̀qqima- or -ə̀qqəyma- (plus variants with initial æ). The LoImpfP is usually -t-à ɣæyma- but -t-à ɣama- is attested dialectally. See §7.3.2.9 for more on 'sit', and on the other stem of the same type (√jyh or √jh 'witness').

3.1.2.7 Medial ...Cy/...Cəy/...Ciy, ...Cw/...Cəw/...Cuw before V

A noun meaning 'preaching' is pronounced [təlu'lijɑ]. Just from its pronunciation, it is difficult to determine whether the correct phonemic transcription of the stem is -lúlyɑ, -lùləyɑ, or -lùliyɑ. This uncertainty is reflected in the accents of variant suffixal plurals.

The main T-ka informant gave the Pl as phonetic [tilu'l(i)jɑwen]. Since the accent is never to the left of the antepenult, there is clearly no structurally recognized V between the second l and the y of the Sg, which I therefore represent as t-ə-lúlyɑ. However, the same speaker also gave a variant Pl [tiluli'jɑwen], where the V between l and y ([j]) is accented and so is obviously structurally recognized. This variant Pl points to a Sg t-ə-lùləyɑ.

Another case of variation, this time dialectal, is the Arabic loanword æl ɣàfəyæt or æl ɣáfyæt 'peace' (among other variants). The difference is best seen in the Pl, æl ɣafəyæt-æn (T-md) or æl ɣàfy-æt-en (A-grm).

The same uncertainty can apply to ...Cw/...Cəw/...Cuw before a V. Thus 'kinship', pronounced [tət:i'r(u)wɑ], arguably phonemic t-əttîrwɑ or t-əttîrəwɑ.

In many cases one can decide on a "correct" transcription by recognizing the morphological pattern involved, and transcribing on the model of the clearer instances of that pattern. This is always the case in verbs, which fall into fixed syllabic types, each of which has its own paradigm. For example, PerfP -ə̀jyæš- 'vaccinate' and -ə̀jwæš- 'trim', regardless of any low-level phonetic variation, clearly belong to the -vPQvC- verb type, as confirmed by their various inflectable stems and derivatives. In the case of 'kinship' (preceding paragraph), the transcription t-əttîrəwɑ seems best, by comparison with similar abstractives like t-əwwĭmədɑ 'humanity' (§8.6.5). As a result, the only real uncertainties occur in a modest number of nouns like [təlu'l(i)jɑ] 'preaching' that do not fit transparently into a stem class.

3.2 Local assimilations and syllabification rules

3.2.1   CC-cluster rules

3.2.1.1   *Stem-final C plus stop-initial suffix or clitic*

Within words, i.e. at the boundary between a stem and a suffix (or clitic), or
between a suffix and a following suffix or clitic, certain **C C-cluster
assimilations** apply. Most of the C-initial suffixes/clitics begin in t and k,
notably FeSg -t, 3MaPl object clitic -\t, and some other pronominal clitics
beginning in t or k. The assimilations, including "vacuous" cases where the
output is identical to the input, are listed in (30).

(30)   CC-cluster Assimilations (Suffix Boundary)

	C plus t			C plus k	

1.. regressive voicing assimilation only

a. assimilation is vacuous

pt	>	pt	pk	>	pk
ft	>	ft	fk	>	fk
tt	>	tt	tk	>	tk
—			ṭk	>	ṭk
št	>	št	šk	>	šk
st	>	st	sk	>	sk
ħt	>	ħt	ħk	>	ħk
—			kk	>	kk
xt	>	xt	xk	>	xk

b. produces geminate (j treated as ɡ)

dt	>	tt	—		
—			jk	>	kk
—			ɡk	>	kk

c. produces nongeminate cluster

bt	>	pt	bk	>	pk
—			dk	>	tk
—			ḍk	>	ṭk
zt	>	st	zk	>	sk
žt	>	št	žk	>	šk
ʕt	>	ħk	ʕk	>	ħk

2. regressive voicing assimilation plus other assimilations (producing geminates)

    d. progressive pharyngealization assimilation

ḍt	>	ṭṭ	—
ṭt	>	ṭṭ	—

    e. progressive point-of-articulation assimilation (j treated as g)

jt	>	kk	—
kt	>	kk	—
gt	>	kk	—

    f. regressive fricative-stop, progressive position assimilation

ʕt	>	qq	ʕk	>	qq

All of the clusters are consistent with **regressive voicing assimilation**. In (30.a-c) there is no other change. In (30.a) the assimilation is vacuous since the two C's already have the same voicing value. In (30.b) the assimilation produces a geminate, while in (30.c) we end up with a nongeminate cluster.

The remaining cases in (30.d-f) are consistent with regressive voicing assimilation, but also involve other changes, always leading to geminate clusters. All cases except one involve t as second C. In (30.d), in addition to regressive voicing assimilation we have **progressive pharyngealization assimilation**. In (30.e), treating j as g, we have **progressive point-of-articulation assimilation**, whereby the velar first C imposes velarity on the following t. In (30.f), we see the same progressive point-of-articulation assimilation starting with ʕ, which also assimilates (regressively) stop articulation from the following t or k.

The changes in (30.a-d) reflect surface **phonetic constraints** and are therefore consistent with the set of allowed and disallowed clusters even within stems. However, the progressive point of articulation assimilations do not apply stem-internally and are therefore morphologically specialized. In particular, the clusters kt and ʕt can occur stem-internally: (PerfP) -ə̀ktɑ- 'remember' and -ə̀ʕtɑ- 'be planted'.

Because of the assimilations in (30), it may be impossible to identify the final C of a stem, based only on the phonetic transcription of a single word containing suffixes or clitics. In particular, surface kk at the boundary could reflect input kk, jk, gk, jt, kt, or gt. On the other hand, qq in this position could reflect ʕt or ʕk, so the stem-final C is clearly identifiable as ʕ, but the suffix- or clitic-initial C could be either alveolar or velar.

The "C plus t" assimilations in column 1 of (30) apply to C-final noun stems combined with Fe[minine] suffix -t (§4.1.2.3), and to C-final inflected verbs followed by a 3rd person object clitic (§10.3.1): 3MaSg -\t(t), 3FeSg -\tæt, 3MaPl -\tæn, 3FePl -\tænæt. Examples of the more interesting assimilations are in (31). The "roots" show the normal consonant sequence for

the respective word-families (for feminine nouns, these are seen as such in the plurals).

(31)   Assimilations with t (FeSg -t, 3rd Person Object Clitics)

word form	gloss	"root"

a. FeSg -t

t-ɑ-bǽlboṭ-ṭ	'grain sack'	√blbḍ
t-ề-šek-k	'chase'	√šj (or √šg)
t-æ-mằšæq-q	'Tamashek woman'	√mšɤ
t-ɑ̀-wdək-k	'settling down'	√dk

b. 3FeSg object clitic -\tæt

ǐ-ddæq-\qæt	'he drove her away'	√dɤ
s-ə̀bdək-\kæt	'make it-Fe wet!'	√bdj

For more feminine nouns see §4.1.2.3.

The "C plus k" assimilations in column 2 of (30) apply to combinations involving a C-final stem or word followed by a 2nd person object clitic (§10.3.1): 2MaSg -\kæy, 2FeSg -\kæm, 2MaPl -\kæwæn, 2FePl -\kæmæt. Examples of the more interesting assimilations are in (32).

(32)   Assimilations with k (2nd Person Object Clitics)

word form	gloss	"root"

2MaSg object clitic -\kæy

ǐ-ddæq-\qæy	'he drove you-MaSg away'	√dɤ
i-ss-ə̀bdæk-\kæy	'he made you-MaSg wet'	√bdj

No assimilation occurs when the first C is a sonorant {y w r l m n}, except for positional assimilation of n, e.g. /nk/ > [ŋk] (subphonemic shift).

Except for sonorants, the output value of the [±voiced] feature is determined by the second rather than first C, so {d ḍ j g b ž z ʕ ɤ} in (30) lose their voicing before t or k.

My informant for R (Gourma zone) had two multisyllabic nouns, phonetically similar to each other, with apparent /jt/ becoming tt instead of kk (33).

(33)   Rharous Cases of /jt/ → tt

	gloss	Sg	Pl
a.	'wild onion'	t-a-mẓələ̀llət-t	t-i-mẓələ̀lləj-en
b.	'ankle'	t-a-mẓə̀ẓẓət-t	t-i-mẓə́ẓẓɑj

However, these apparently irregular t/j alternations may involve dialect mixing. Both 'wild onion' and 'ankle' have dialectal variants with final consonants (in the Pl) other than j. 'Wild onion' is attested with stem-final j, k, and y, and with zero C in this position.

3.2.1.2 *Nasal assimilation and dissimilation*

In most dialects, /n/ appears as [m] before a labial stop {b p}, and as velar or uvular [ŋ] before stops {g k ɣ}. In the cluster ŋɣ, the ɣ is pronounced as uvular stop or affricate (§3.1.1.3). Observable alternations occur primarily in verbs whose first C is a nasal. Two examples: 1) PerfP -ə̀mbær- '(herd) be taken to pasture at night' and variant VblN t-ā̀-mbər-t versus LoImpfP -nábbær- and VblN a-næbar ; 2) PerfP -ə̀ŋɣa- 'kill' versus LoImpfP -náqq- and VblN t-è-næɣe. The most obvious analysis for these cases is that the /n/ is basic but undergoes point-of-articulation assimilation to an immediately following C.

One could alternatively argue that an initial /m/ or /ŋ/ shifts to n stem-initially. This is dubious for /ŋ/ since the velar nasal is a marginal phoneme in prevocalic position (§3.1.1.2). However, this analysis is fairly credible for /m/, since /m/ in verb prefixes (there is no /m/ in nominal prefixes) shifts to n when the stem contains a labial. The prefixes in question are Mediopassive (§8.3) and Agentive (§8.8). By extending this dissimilation to e.g. -nábbær- (preceding paragraph), one could actually argue for a basic lexical representation with /m/ instead of /n/.

On the whole, I prefer the nasal-assimilation analysis, since it makes more sense for the alternations of n with ŋ.

(34)   **Nasal Assimilation**

n adopts the point of articulation features of an immediately following noncoronal (i.e. labial, velar, or uvular) stop.

For T-ka and most other dialects, it makes no difference whether the /n/ is the first member of an underlying cluster, or comes into contact with the following obstruent due to Stem-Initial Syncope. However, the K-d informant conspicuously failed to apply Nasal Assimilation in clusters resulting from Stem-Initial Syncope, i.e., in cases where the initial n is separated from the

following obstruent by a short V in the imperative. This is the case with superheavy verb stems that have basic (i.e. Imprt) shapes beginning CvCV... (v = short vowel subject to Stem-Initial Syncope, V = any long or short vowel). An example is '(door shutters) be brought together', Imprt nə̀kəbbə-t, hence basic lexical form -nvkvbbʋ- (+ -t). The LoImpf appears in T-ka (and T-md) as -t-ïŋkəbbu-t with phonetic [ŋk], showing Stem-Initial Syncope followed by Nasal Assimilation and Default Accentuation. In K-d we get -t-ïnkəbbu-t, showing Stem-Initial Syncope followed by Default Accentuation but no Nasal Assimilation. The K-d informant occasionally had a faint short vowel, or at least a separate consonantal release, between the two C's, suggesting that Stem-Initial Syncope here is very low-level indeed. In A-grm we get -t-inə̀kəbbi-t, where Stem-Initial Syncope fails to apply, Default Accentation targets the unsyncopated schwa, and of course there is no opportunity for Nasal Assimilation to apply.

In all dialects, Nasal Assimilation does apply to the onsets of light verb stems, e.g. PerfP -ə̀mbær- 'be taken to pasture at night' and Imprt ə̀mbər, compare LoImpfP -nábbær- and VblN a-nǽbar (dialectally also t-à-nəbre and t-à-næbra).

One could infer from these data that Stem-Initial Syncope in the onset of superheavy stems like -nvkvbbʋ- (+ -t) is a recent dialectal development.

Mediopassive prefix -m- on verbs, and Agent prefix -m- deriving nouns from verbs, are replaced by **dissimilatory** allomorph -n- when the stem contains a labial consonant {b f m}. It does not matter whether there is an intervening n or other coronal. Thus agentive a-n-ánam 'one who is fond' (verb -vnvm- 'be fond'), and mediopassive -ə̀nn-əbḍa- 'be dislocated'. The regular labial prefix -m- is observed in agentive æ-m-ájrad 'one who can disappear' and mediopassive -æ̀m-era- 'be opened' (PerfP). For more details, examples, and exceptions, see §8.3 (mediopassive) and §8.8 (agentive). Similarly, the Reciprocal prefix, normally -nvm-, is replaced by -n- (§8.4), and denominal derivational prefix -mvs- is replaced by -nvs- (§8.10) when the stem contains a labial consonant.

3.2.1.3   /ḍ/ → ṭ before voiceless obstruent

ḍ is devoiced to ṭ before a voiceless obstruent (stop, fricative, or sibilant, but not h). Thus -ə̀ṭfæs- '(udder) be full', Imprt ə̀ṭfəs, etc., but LoImpfP -ḍáffæs- bringing out the lexical ḍ. Likewise, -ə̀ṭfa- 'be poured', Imprt æ̀ṭf, but LoImpfP -ḍáff- and related noun t-è-ḍæffe 'bank (of pond)'. Contrast -òḍha- 'fold (tent)'.

ḍ and ṭ may once have been allophones of a single phoneme (see §3.1.1.4, §3.1.1.8) but they are now at least partially separate.

In the case of the verb **'laugh'**, the C sequence is either √ṭṣ (in the unbroken cluster ṭṣ) or √ḍẓ (when the two are separated by a V), thus PerfP -ə̀ṭṣa- but LoImpfP -ḍáẓẓ-. Since the cluster ṭṣ is entirely voiceless, there is no

reasonable way to derive it by assimilation from /ḍẓ/, which would be perfectly pronounceable without change. Moreover, in the causative, where only the cluster ṭṣ occurs in the stem proper, the Causative prefix allomorph is -s- (or -ṣ-) rather than -ẓ- (e.g. PerfP -ə̀ss-ətṣa-), though -ẓ- would be expected if the lexical representation of the core stem contained /ẓ/.

3.2.1.4   *zd → zz, *ẓḍ → ẓẓ

Historically, there are indications of reductions of *zd to zz and of *ẓḍ to ẓẓ. Perhaps in some cases the etymon had *t instead of *d. Compare (Imprt) ə̀zzəy **'get to know'** with Niger Tamajak "əzdəy" (LTF2 367). This verb has now merged formally, in Malian Tamashek, with (Imprt) ə̀zzəy 'get well' (Niger Tamajak "əzzəy"); cf. MGT 7.93. Likewise, compare (Imprt) ə̀ẓẓəf **'be black'** (Imprt) with e.g. abstractive nominal t-æssæ̀ṭṭæf-t 'dark color; blackness', and with Niger Tamajak forms based on consonant sequences √sṭf and √ẓḍf (LTF2 384). In these cases, we get a transfer from the nongeminate type -vPQvC- to the geminate -vPPvC- type, which has morphological consequences (different shapes for long imperfectives, and for the VblN).

A case involving incomplete paradigmatic reassignment is (Imprt) æ̀ẓẓ **'weave'**, which corresponds to Niger Tamajak "ăẓḍu" (LTF2 384, cf. MGT 7.119). The Tamashek PerfP is -ə̀ẓẓa-. Given such Imprt and PerfP forms, one would expect LoImpfP #-t-áẓẓ- on the model of LoImpfP -t-ákk- for Imprt æ̀kk 'go', the other geminate -vPPʋ- verb. Instead we get -ẓátt- (all dialects), showing an alternative consonantal sequence √ẓt also seen in VblN t-è-ẓæte (cf. Niger Tamajak "teẓăte"). The t in -ẓátt- and in t-è-ẓæte is evidently a vestige of the alveolar stop in Niger √ẓḍ.

'Mount (donkey) bareback' has Imprt ə̀ẓẓəm. Tamajak "əẓḍəm" (LTF2 384) shows that this is another case of *ẓḍ → ẓẓ.

3.2.1.5   *Prefixal t-Deletion*

This rule is morphologically specialized. It applies clearly in combinations of pronominal subject prefix t- (3FeSg or any 2nd person category) plus a C-initial stem. Because perfective and inflectable short imperfective verb stems begin with V's in most paradigms, the principal context for Prefixal t-Deletion is with stems of the long imperfective family. Example with a LoImpf stem: 3MaSg i-sáss 'he drinks', nə-sáss or n-sáss 'we drink', but 3FeSg Ø-sáss 'she drinks' and 2Sg Ø-sássæ-d 'you-Sg drink'. It does not matter what C the stem begins with. In addition to long imperfectives of virtually all stem-classes, the rule also applies before inflectable short imperfectives of causatives, which are also C-initial since they fail to undergo Stem-Initial V-Insertion, hence 3FeSg àd Ø-s-irəd 'she will wash'. I use Ø- to indicate that Prefixal t-Deletion has occurred. There are also many adjectival

C-initial perfectives, before which t- fails to appear, but these stems avoid 3MaSg i- (and often 1Pl n-) as well, so in this case the absence of t- is entailed by a more general avoidance of subject prefixes.

(35)   **Prefixal t-Deletion**

A pronominal subject prefix of the form /t-/ is deleted before a C-initial verb stem.

The rule does not apply to nominal morphology, where Fe prefix t- is never deleted. In the rare cases (involving loanwords) where Fe t- directly precedes a C-initial stem that lacks a vocalic prefix, Schwa-Epenthesis applies and we get tə- (§3.2.5). In several dialects, though not in T-ka, the FePl prefix combination t-i- reduces (by Prefix Reduction) to t-Ø- before a stem beginning in CV..., e.g. Pl t-ï-kəbr-en 'sparrows', but reduced form (in a PP) dæɣ 't-Ø-kəbr-en 'in the sparrows'. In this combination, the t- is not deletable. (T-ka reduces -i- to schwa here: dæɣ 't-ə̀-kəbr-en.)

Whether Prefixal t-Deletion also applies to the -t- prefix marking the long imperfective stems in many verb classes is a tricky question. In those cases where it appears audibly, this -t- is always followed by a V, so there is no question of deletion. However, all cases (except one) where -t- is absent from a long imperfective stem involve C-initial stems like LoImpfP -báddæd- 'get up' and causative -s-árad- 'wash'. Although I do not favor this analysis, one might argue that -t- is underlyingly present here but is always deleted by Prefixal t-Deletion.

The one case where -t- is (or rather may be) absent from a long imperfective stem is in the class of verbs of basic shape -vPvC-. Here the LoImpfP varies between -əPPáC- and -t-əPPáC-, e.g. -əwwát- and -t-əwwát- 'hit'. We therefore have only equivocal evidence as to whether -t- is part of all long imperfective stems. The alternative analysis is that -t- is in complementary distribution with Γ-c2 (i.e. gemination of C_2); see §3.4.2.1.

In the type -əPPáC- varying with -t-əPPáC-, if a t- subject prefix is present we always get e.g. phonetic [təw:a't], which can be parsed morphologically as either t-əwwát (with 3FeSg t-) or as Ø-t-əwwát from /t-t-əwwát/.

3.2.2   Longer-distance consonantal interactions

3.2.2.1   Consonantal metathesis

There are no truly productive metathesis rules. The cases discussed here involve the consonantal sequences (often with intervening V, sometimes also with an intervening C) in (36).

(36)   Cases of Consonantal Metathesis

a.	hS	Sh		(S = a sonorant or fricative)
b.	rwɤ	wrɤ	rɤ	
c.	ɤs	sɤ		
d.	ḍj	jḍ		
e.	dj	jd	jj	

I begin with instances involving h, mainly underlying /hS/ metathesizing to Sh when not separated by a V, where S is a sonorant or fricative.

The verb 'see' appears with consonantal sequence √nhy or √hny. The latter is used when a V intervenes between the first two stem C's, the former when there is no V in this position: LoImpfP -hánnæy- and VblN a-hǽnay, but ShImpf -ə̀nhəy-, PerfP -ə̀nhæy-, and nominal m-ə̀nhuy 'something visible, (a) sight'. I recognize a lexical stem /-vhnvy-/ that metathesizes /hn/ to nh when the two are not separated by a V.

The verb 'weep' has a similar alternation: LoImpfP -háll- and VblN t-à-hæla, but ShImpf -æ̀lh (/-ælhɪ-/) and PerfP -ə̀lha-. I recognize lexical /-vhlʋ-/ with /hl/ metathesizing when the two C's are not separated.

Metathesis does not occur when the C's in question are the first two in a superheavy stem subject to Stem-Initial Syncope. Examples: 'break loose', with Sg Imprt hə̀ləbbə-t, PerfP -æ̀hlæbbæ-t (not metathesized to #-æ̀lh...), and (inflected) LoImpfP -t-ĭhləbbi-t; 'moan' with Sg Imprt hə̀nəffə-t and PerfP -æ̀hnæffæ-t. If we take the metathesis in 'see' and 'weep' to be a genuine phonological rule, we would have to order it before Stem-Initial Syncope, which seems reasonable on other grounds (in some dialects Stem-Initial Syncope either fails to apply [A-grm], or does apply but does not feed even routine CC-cluster assimilations such as Nasal Harmony [K-d]).

The LoImpfP corresponding to PerfP -ò̀hæɤ- 'snatch' is -t-íhəɤ- in most dialects. For Im, R, and some Kidal-area dialects, LoImpfP verbs of the type -t-íCəC- syncopate the schwa before a V-initial subject suffix (an Im example is t-íwɤ-ən 'they-Ma dance'; for K I can cite tíhẓ-æn 'they approach'). In R but not the other dialects, this syncope leads to metathesis of /hɤ/ to /ɤh/: metathesized t-íɤh-ən 'they-Ma snatched' corresponding to K-d t-íhɤ-ən (cf. T-ka t-íhəɤ-æn). No metathesis occurs in R in this morphological context when the cluster is /hr/ or /hẓ/ instead of /hɤ], so there is no general rule even in this dialect that /hC/ metathesizes to /Ch/: wær t-íhẓ-əd 'you-Sg do not approach'. T-ka and some other dialects do not syncopate -t-íCəC- stems, so the issue of metathesis does not arise here.

Another dialectal case is the term for 'scrub acacia', i.e. *Acacia tortilis* (dominant species in thorn scrub): á-həkš (K, T, Ts) but á-həšk (R), also á-šək without the *h in the east (A-grm, Gao, Im).

I now turn to cases not involving h. The stem '(be) yellow, light brown' has a C-sequence √wrɤ (Imprt ĭwrɤ 'be yellow!', adjectival noun à-wrɤ 'yellow one') alternating intraparadigmatically with √rɤ (PerfP æ̀rɤ 'it

became yellow' (but variant wǽraɣ also recorded for K-d), abstractive t-ǽ-roɣe (arguably t-ə-ruɣe) 'yellowness'). For Niger Tamajak, forms with √rwɣ alongside √wrɣ and √rɣ are reported (Imprt "irwaɣ", LTF2 282). For Algeria we have √rɣ and √rwɣ (DTF 4.1662).

Another case is 'carrion', which appears as m-ǽɣsoy or feminine t-a-m-ǽɣsoy-t in most dialects with √ɣsy consonantism (also reported for Niger, LTF2.124), but as m-ǽsɣoy in T-ka.

There are a number of cases involving C sequences √ḍj and √jḍ, or √dj and √jd. Tamashek generally has √jḍ corresponding to √ḍj (ḍg) in Niger and Algeria. It is not clear to me which sequence is historically original. Tamashek verb -ʊjvḍ- 'rap on nape' (PerfP -òjæḍ-) still corresponds to a noun t-ìdji-t-t '(a) rap on the nape' in K-d, so there is a synchronic alternation in this dialect; in Niger Tamajak the verb is -vḍvg- (LTF2 49). Tamashek -vjvḍ- 'go off to war' has an Algerian counterpart -vḍvj- (DTF 1.263ff.). Tamashek -jvḍḍvḍ- 'be terrified, flee' corresponds to Niger -ḍvggvg- (LTF2 50). 'Morning' is attested in variants such as a-jdə́lset (or a-gdə́lset), compare Niger Tamajak √dglšt (LTF2 30). There are also some cases of three variants showing metathesis and assimilation. For example, 'hail, hailstones' appears as æ-díjræš (and æ-dígræš), æ-jídræš, and (assimilated) æ-jíjræš. Likewise, 'wide acacia pod' is recorded as a-šǽjæda, a-šǽdæja, and (assimilated) a-šǽjæja.

A verb 'scoop up' appears normally as -vksvl- (A-grm, T-ka, also Niger and Algeria), but I recorded -vskvl- for K-d.

There is one case of **consonant-vowel metathesis**. This is the verb 'wound', which appears (depending on dialect) as -biwvs- (PerfP -ǽbewæs-T) or -buyvs- (PerfP -ǽboyæs-, K and R). I can find no attestation of this verb in Niger Tamajak; for Algeria -buyvs- is reported (DTF 1.44 "bouis").

3.2.2.2   *Long-distance sibilant assimilation (Sibilant Harmony)*

In causative verbs, and in Instrumental nominals derived from verbs, there is a prefix -s-. If the following stem contains a sibilant other than s, the prefix assimilates to this sibilant. Thus compare causatives -s-vlvbbvqqʊ- (+ -t) 'dip in liquid', -š-vrjvš- 'cause to walk', and -ẓ-vm-vẓlvɣ- 'differentiate'. For more examples see §8.1.2 (causatives) and §8.11 (instrumental nominals).

One partial exception is -š-vnšʊ- 'buy, sell', which appears as -ž-vnšʊ- in some dialects and as -z-vnš- (or -z-vnhʸ-) in K-f. In this rather lexicalized causative (the simplex -vnšʊ- 'be bought, sold' is not common), we get positional but not voicing assimilation. The A-grm speaker (less often the R speaker) occasionally failed to assimilate the prefixal -s-, as in -s-vttvšʊ- (+ -t) 'sneeze', especially in elicited causatives that are probably not in common use. Speakers of all other dialects applied the assimilation more systematically.

This sibilant assimilation is a reflection of **Sibilant Harmony**, which seems to apply to stems as well as to stem-prefix combinations. Other than

'buy, sell' cited above, I have a hard time finding a single example (not a recent borrowing) that does not respect sibilant harmony, as opposed to hundreds of stems with harmonized sibilants.

3.2.3 VV-Contraction

When two vowels come together at a morpheme boundary, contraction occurs unless the combination can be converted into a VCV sequence (by inserting h or a homorganic semivowel). See (41), below, for a summary of the various outputs.

3.2.3.1 *VV-Contraction with 3MaSg subject prefix i-*

One case of VV-Contraction is when 3MaPl subject prefix i- is attached to a verb beginning in a vowel. Inflectable verb stems may begin with a C (see below) or with one of the V's {ə æ ɑ i o u}, with u the rarest (-ùjəj- 'be distant').

When the verb-initial vowel is ə, the contracted output is i-, as in /i-əbdæd/ > ì-bdæd 'he stood up'. This is true even when a verb-initial ə appears on the surface as æ because of the shift of ə to æ before a BLC like q or ḍ (§3.1.2.2). However, the BLC does force the contracted /i/ to lower to e, phonetic [ɛ]. An example is 'he consented', with 3MaSgS /i-/ added to PerfP stem -əqbæl- to produce ì-qbæl, phonetic [ɛ'qbæl].

However, when the 3MaPl prefix is added to a verb beginning with a true æ, the output is æ, hence Ø-æ̀ss-omæm 'he sucked'. Because many PerfP verbs stems begin in ə in T-ka but in æ in other dialects, there are many conspicuous dialectal differences, e.g. between T-ka ì-mmu-t 'he died' and other dialects' Ø-æ̀mmu-t.

The 3MaSg prefix is likewise realized as zero before a full vowel {ɑ i o u} (there are no verb forms beginning in e), as in (PerfP) Ø-ògdæh 'he was equal' and (Reslt) Ø-ujə́j 'he is distant'.

The 3MaSg subject prefix that I interpret as i- for Tamashek may well have been *y- originally. In this event, Tamashek contracted *y-ə to i, and deleted *y before other vowels. In Tayert dialects of Niger, we still get 3MaSg y- before ə and before the full vowels (LTF2.419).

3.2.3.2 *VV-Contraction with C(ə)- subject prefixes*

The C-initial subject prefixes (§7.4.1), e.g. 1Pl n(ə)-, 2nd person t(ə)-, and 3FeSg t(ə)-, could be represented either as C- or Cə-. If we choose C-, at least in some dialects a Schwa-Epenthesis rule would have to apply (before a stem-initial C) to account for a Cə- allomorph, as in 1Pl LoImpfP nə-bás 'we

vomit' (but dialectally n-báss). If we choose Cə- as the basic representation, we must apply VV-Contraction to delete the schwa before a stem-initial V, as in PerfP -əjjæš- 'enter' in 1Pl /nə-əjjæš/ → n-əjjæš 'we entered', and PerfP -òyya- 'leave' in 1Pl n-òyya 'we left'. See §7.4.1 for more dialectal detail on this matter.

3.2.3.3   VV-Contraction at suffixal or clitic boundaries

In this section I will first cover verb-suffix combinations, then noun-suffix combinations, then combinations involving clitics.

   Verbs may end in a full V {i ɑ u}, or in one of the underspecified vocalic segments /ɪ/ or /A/ (§3.1.2.4). In this section I discuss contractions, beginning with inflectional suffixes and then passing to clitics.

   With **inflectional suffixes**, the initial V is always æ or e. This affects subject suffixes (1Sg -æγ, 2Sg -æd, 3MaPl -æn, 2MaPl -æm), Participial suffixes (MaSg -æn, FeSg -æt), and MaPl Imperative (`)-æt. These suffixes always contract with a preceding vowel (there is no insertion of h or of a semivowel). One suffix begins with a full V, namely Hortative (`)-et. This suffix contracts with a preceding deletable stem-final V, but when it follows a full V (as in some long imperfectives) we get an allomorph (`)-het that does not require VV-Contraction. The outputs of VV-Contraction are shown in (37).

(37)   Verb plus Inflectional Suffix VV Outputs

   a. deletable stem-final V_1 plus full V_2
       /A + e/ → e
       /ɪ + e/   → e

   b. high full V_1 plus short V_2
       /u + æ/ → u
       /i + æ/ → i

   c. deletable stem-final V_1 plus short V_2
       /ɪ + æ/ → æ   with 1Sg subject -æγ or MaPl Imprt (`)-æt
       /ɪ + æ/ → ə   otherwise (2Sg -æd, 2MaPl -æm, 3MaPl -æn)
       /A + æ/ → æ

   d. /ɑ/ plus short V_2 (see discussion below for specific contexts)
       /ɑ + æ/ → e   [augmented verb]
       /ɑ + æ/ → æ   [non-augment verb, PerfP]
       [this æ can be modified by ablaut to e (PerfN) or ɑ (Reslt)]

   (37.a) applies to combinations of deletable stem-final V, as in many short imperfective verbs, plus Hortative (`)-et (§7.2.3.3). The stem-final V is simply

deleted before the full vowel e, as we would expect. The Hortative suffix requires accent on the preceding syllable, so we cannot really tell whether VV-Contraction here precedes or follows Default Accentuation. Examples of (37.a) are n-às-et-\ə́dd 'let's come!' (§7.2.3.3) with ShImpf /-asɪ-/ 'come', and long hortative nə-jà̰ll-et 'let's go (every day)' (§7.2.5.5) with LoImpfP /-já́llA-/.

Now consider cases where V₂ is a short vowel (37.b-d). In (37.b), the suffixal /æ/ is deleted after the full high V. We see this in ə̀su-n 'they-Ma coughed' and t-ǐwi-n 'they-Ma are born', both of which end in 3MaPl subject suffix /-æn/. This treatment was observed in most Tamashek dialects, but I did record ə̀s-æn 'they-Ma coughed' for A-grm, where the stem-final high V is deleted before æ.

In (37.c), the stem ends in a deletable vowel, high /ɪ/ or low /A/. These segments are deleted in word-final position, and show up as short ə and æ, respectively, before a C-initial subject suffix. When they combine with suffix-initial /æ/, the regular outputs are /ɪ + æ/ → ə, and /A + æ/ → æ. Since /ɪ/ is arguably a special case of stem-final /ə/, and /A/ is arguably a special case of stem-final /æ/, one could summarize these outputs as deletion of the suffixal /æ/ following the stem-final short V. Examples, using 3MaPl -æn, are Future ɑd æ̀kšə-n 'they-Ma will eat' (/ækšɪ-æn/), and LoImpfP já́llæ-n 'they-Ma (regularly) leave' (/já́llA-æn/). Because the quality of the stem-final V determines the quality (æ or ə) of the output, I put the hyphen after the output V.

In the case of /ɪ + æ/, there are two suffixes that give the output æ instead of the usual ə. For these suffixes, therefore, /ɪ + æ/ and /A + æ/ merge as æ. The first suffix is **MaPl Imprt** (⁀)-æt. The effect is that (⁀)-æt is just added to the unsuffixed Sg imperative (prior to resyllabification if applicable). Thus Imprt æ̀kš 'eat!', MaPl Imprt æ̀kš-æt 'eat!', with /ækšɪ/. It is questionable whether æ̀kš-æt is really produced by VV-Contraction applying to /ækšɪ-æt/; it may be more realistic to first derive Sg Imprt æ̀kš and then add the MaPl Imprt suffix as an outer morphological layer.

The other problematic suffix is **1Sg** -æɣ. Because ɣ is a BLC, we could get phonetic -æɣ from either /æɣ/ or /əɣ/, so we might allow VV-Contraction to apply in the same way as for e.g. 3MaPl -æn and then have a late rule merge æ and ə into æ before ɣ. In this way, VV-Contraction could apply in the same way to 1Sg -æɣ as it does to the other (non-imperative) subject suffixes beginning in æ, though the distinction between æ and ə outputs would later be neutralized. However, this analysis will not work.

Consider the inflectional paradigm of stems like ShImpf /ækšɪ/ 'eat': 1Sg æ̀kš-æɣ, 2Sg t-ə̀kšə-d, 2MaPl t-ə̀kšə-m, 3MaPl ə̀kšə-n. We may throw in 2FePl Imprt əkšə̀-mæt for good measure. Note that all the combinations except 1Sg æ̀kš-æɣ show a surface ə in the first (as well as second) syllable. This is due to Short-V Harmony (§3.2.6), where the initial syllable shifts /æ/ to ə under the influence of ə in the following syllable. The fact that this does not happen in 1Sg æ̀kš-æɣ shows that the second syllable has /æ/ rather than /ə/ at

the point when Short-V Harmony applies. Therefore, VV-Contraction must exceptionally convert /ɪ + æ/ to æ instead of ə in connection with the 1Sg suffix. For this reason, I transcribe ǽkš-ær̀ with the hyphen before the suffixal æ.

Since, before a C, stem-final /ɪ/ is realized as ə, while /A/ is realized as æ, one could simply equate /ɪ/ with ə and /A/ with æ. Or we could just say that these abstract segments "become" ə and æ, respectively, before a suffix, including a V-initial suffix. If so, the regular formulae /ɪ + æ/ → ə and /A + æ/ → æ in (37.c) reduce to /V₁ + æ/ → V₁, exactly parallel to the cases with V₁ = full high V in (37.b). Can we do the same when V₁ is /ɑ/, followed by a short suffixal V?

In (37.d), we see **variable treatment of /ɑ + æ/.** There are actually three surface outputs of this combination, namely æ, e, and ɑ. However, the ɑ output and some instances of the e output are secondarily derived from /æ/, by belated attachment of ablaut formatives.

Consider the following 3MaPl forms for 'eat': PerfP ə̀kšæ-n, PerfN ə̀kše-n, and Reslt əkšá-n. These forms reflect the ability of verb stems of the (light) shape -v(C)Cʊ- to include the material **up to and including the first C of a subject suffix in the domain of ablaut.** This **rebracketing** allows the entire 3MaPl suffix -æn to be included in this domain; for 3FePl -næt the domain stops at the n. When combined with -vkšʊ- 'eat', the 3MaPl PerfP /əkšɑ-æn/ is realized as ə̀kšæ-n, showing an apparent contraction /ɑ + æ/ to short æ. The sequence ə̀kšæ-n, when under negation, is subject to PerfN ablaut (formative ∈-pc1f, §7.2.2.3), which changes /æ/ in the relevant position (first postconsonantal vowel, also final-syllable vowel) to e. Likewise, ə̀kšæ-n can take Reslt ablaut (χ̇-pc1 and χ̣-pc1, §7.2.2.2), which lengthens and accents the first postconsonantal vowel, turning /æ/ into á. In this analysis, VV-Contraction itself is not responsible for the e or ɑ outputs, just for the initial æ output. Behaving like 3MaPl -æn in these respects is 2MaPl -æm. After heavy (though not light) V-final non-augment verbs, we can add 1Sg -ær̀ and 2Sg -æd (to make a clean sweep of V-initial subject suffixes). Thus -rvftʊ- 'have a scare', 3MaPl PerfP ərrə̀ftæ-n, 1Sg ərrə̀ft-ær̀.

However, the short output æ seems rather odd phonologically for /ɑ + æ/, i.e. for the combination of a full and a short V. I will now argue that the regular phonological output for this sequence (in verbs at any rate) is not æ but e.

In fact we get e rather than æ when any /æC/ subject suffix, including 1Sg -ær̀, is added to an augment verb. Verbs of the augment class end in a full V, as seen most clearly in their VblN (which end in i or u). The combination of inflected verb plus C-initial subject suffix, or zero suffix (in connection with a subject prefix), requires Augment -t- immediately following the verb stem. However, a V-initial subject suffix such as 3MaPl -æn or 1Sg -ær̀ does not allow the Augment, so VV-Contraction must occur. The result is e. Example ('be in large quantity'): VblN à-bəffu, 3MaSg PerfP ì-bbuffæ-t (T-ka,

dialectally ĭ-bbəffæ-t or Ø- æ̀bbuffæ-t), 3FePl PerfP əbbùffæ-t-næt, but (with VV-Contraction) 3MaPl PerfP ə̀bbuffe-n and 1Sg PerfP ə̀bbuffe-ɤ.

e rather than æ is also the output when light V-final non-augment verbs like -vkšʋ- 'eat', in the perfective (PerfP -ə̀kšɑ-), combine with singular V-initial subject prefixes, 1Sg -æɤ and 2Sg -æd. Thus contrast 3MaPl ə̀kšæ-n 'they-Ma ate' and 2MaPl t-ə̀kšæ-m 'you-MaPl ate' with 1Sg ə̀kše-ɤ and 2Sg t-ə̀kše-ɤ.

If e is the regular output of /ɑ + æ/, at least for verbs, how do we account for the short æ output for the light V-final non-augment verbs like -vkšʋ- 'eat'? I take this output to be due to **Presuffixal ɑ-Shortening** (§3.4.9.1), a morphophonemic rule that is seen most transparently with V-final non-augment verbs followed by a C-initial subject suffix, as in 3FePl PerfP ə̀kšæ-næt 'they-Fe ate' from /əkšɑ/. If this rule is allowed to apply before V-initial (as well as C-initial) subject suffixes, then the derivation of 3MaPl ə̀kšæ-n 'they-Ma ate' from /əkšɑ-æn/ is mediated by Presuffixal ɑ-Shortening, which produces intermediate /əkšæ-æn/. This is, for all practical purposes, the /A + æ/ → æ process already seen in (37.c).

The difference between outputs æ and e for underlying /ɑ + æ/ in (37.d) also correlates with a **difference in accentuation**. In both cases, the data are consistent with Default Accentuation, but only if the **relative ordering of Default Accentuation and VV-Contraction** is inverted in the two cases. Specifically, when the output is æ, both the stem-final and suffix-initial V's are "counted" in Default Accentuation, so after contraction we get a default accent on the word-penult (which is the underlying antepenult). In this derivation, Default Accentuation must precede VV-Contraction. Example: /ərrəftɑ-æn/, surface ərrə̀ftæ-n 'they-Ma had a scare'. By contrast, when the output is e, this contracted V is treated as a single V in Default Accentuation, resulting in a default accent on the word-antepenult. Example: /əbbuffɑ-æn/, surface ə̀bbuffe-n 'they-Ma were in large quantity'. For more on interactions between VV-Contraction and Default Accentuation, see §3.3.1.3.

The grammatical distribution of the regular e output, and of the morphophonemically specialized æ output, is summarized in (38).

(38)　　æ/ɑ Versus e Outputs for /ɑ + æ/ in Verb-Suffix VV-Contraction

conversion	distribution
/ɑ-æ/ → e	a. augment verbs: all V-initial subject suffixes
	b. light V-final non-augment verbs: 1Sg and 2Sg subject suffixes
	c. V-final non-augment long imperfectives: all V-initial subject suffixes

/ɑ-æ/ → æ   d. light V-final non-augment verbs: 2MaPl and 3MaPl
                 (but not 1Sg or 2Sg) subject, and V-initial
                 Participial suffixes
                 e. heavy non-augment verbs: all subject and Participial
                 suffixes

Some V_1V_2 combinations escape contraction by adding h, or by converting a high V_1 into V_1 plus **homorganic semivowel**. One could explain the alternations of h and zero as due to allomorphy, to **h-Insertion**, or to h-deletion. Simple allomorphy works for MaPl Imprt (ˋ)-æt, Hortative (ˋ)-et, and Future è, which occur in very restricted environments. The h-Insertion rule is formulated as (653) in §10.2.1.1, but note the fine print there. With dative pronominal clitics, the h-form occurs in several postconsonantal environments, making h-Insertion dubious. h-Insertion and homorganic semivowels are absent from nominal morphology, and where they do occur there is much variation. Thus -vsu- 'cough' has MaPl Imprt əsǔ-hæt (T-ka), əsǔw-æt (R), or ǽss-æt with VV-Contraction (A-grm).

In T-ka, the ShImpf of augmented verbs like -buffʊ- 'be in large quantity' undergoes (among other things) u-Spreading (119, §3.4.9) in forms lacking the Augment -t-, as in 3MaPl ShImpf əbbəffu-n 'they (will) be in large quantity' from /-əbbuffi-æn/ (via /-əbbəffu-æn/ with u-Spreading and Medial V-Shortening (120)). If the u of -əbbəffu-n is considered to be contracted from /u-æ/ (after u-Spreading), it fits (37.b). Alternatively, we could order VV-Contraction before u-Spreading, e.g. /-əbbuffi-æn/ → /-əbbuffi-n/ → /-əbbəffu-n/.

However, in some eastern dialects, u-Spreading and Medial V-Shortening do not occur in this ShImpf paradigm. Instead of əbbəffu-n, the 3MaPl ShImpf appears (e.g. in R dialect) as əbbuffe-n 'they (will) be numerous'. Here the medial u has not been shortened, and has not transmitted its rounding feature to a subsequent V. Since the augmented forms in the ShImpf paradigm have ə (i.e. a high V), as in 3MaSg ǐ-bbuffə-t, it can be inferred that the 3MaPl is from /əbbuffi-æn/. If so, we would have **a case of /i + æ/ realized as e** (rather than as i). This aberrant output e may reflect analogical interference from the perfective paradigms of the same verbs, where output e results from stem-final /ɑ/ plus suffix-initial /æ/, e.g. PerfP əbbuffe-n 'they were (or became) numerous'.

For **nouns**, VV-Contraction occurs in a subset of combinations of V-final stem plus MaPl suffix -æn. The majority of such cases avoid VV-Contraction by using a postvocalic MaPl allomorph -tæn, but there is a significant subset of cases where the MaPl allomorph -æn is used (§4.1.2.13), and these instances do require VV-Contraction. The output of /...V-æn/ is -ɑn after contraction. The input stem-final V is ɑ or i in the vast majority of instances, but there is one case each of o and u (39.a). Though I cannot cite a full set of stem-final V's, there is no counterexample to the generalization that stem-final V combines with MaPl -æn to produce -ɑn.

There are some additional cases where we can posit an underlying stem-final V that is deleted from the unsuffixed MaSg form, based on morphological analogy, vocalism, and/or accent (39.b). For fuller data and discussion see §4.1.2.13.

There are fewer cases of VV-Contraction involving FePl suffix -en, since most V-final feminine nouns have an inner Fe suffix -t- (before FeSg -t or Pl -en), or else (if the FeSg is unsuffixed) use FePl allomorph -ten. In the rare case where FePl -en is added directly to a V-final stem, the output is predictably -en since the suffix already has a full V (39.c).

(39)   VV-Contraction with V-Final Noun Stem and MaPl -æn or FePl -en

	input	output:	example (Sg)	Pl	gloss
a.	/ɑ + æ/ → ɑ		ǽ-harɑ	i-hár-ɑn	'saltlick'
	/i + æ/ → ɑ		e-dǽhi	i-dǽh-ɑn	'sand'
	/u + æ/ → ɑ		æ-s-áru	i-s-úr-ɑn	'pretext'
	/o + æ/ → ɑ		à-læššo	ì-læšš-ɑn	'turban cloth'
b.	/V + æ/ → ɑ		ɑ-s-ə́nt	ì-s-ənt-ɑn	'beginning'
	["V" = deletable stem-final vowel, here /ɪ/ in /ɑ-sə́ntɪ/]				
c.	/ə + e/ → e		t-ɑ-kə̀ndə-t-t	t-ì-kənd-en	'lily tuber'

Comparison of the verb and noun data show that no simple phonological analysis can account for VV-Contraction in the two cases. Nominal MaPl suffix -æn imposes its quality on the contraction V, resulting in ɑ. By contrast, 3MaPl suffix -æn on verbs basically loses its /æ/ after a stem-final V. Even within verb morphology, there are important differences between e.g. 3MaPl -æn, 1Sg -æɣ, and 2Sg -æd. As usual in Tamashek, the "phonology" is morphologically specialised.

V-initial **clitics** are directionals (Centripetal -\ə́dd or -\idd, Centrifugal -\in), dative pronominals (beginning in -\ɑ-), and certain object pronominals (beginning in i or e). All of the V-initial clitics have allomorphs beginning in h, or else allow a homorganic semivowel to be inserted after a preceding high V, either of which obviates the need for VV-Contraction. A further complexity is that several object pronominals have structurally different allomorphs depending on whether the preceding stem ends in a V or in a C (e.g. 3MaSg -\tt and -\e), so we do not always have a non-contracted version to clarify the "underlying" form of the postvocalic allomorph. There is also a fair amount of dialectal variation, especially in the use of h-initial allomorphs, but also in the vowel of directional clitics (e.g. Centripetal -\ə́dd or -\idd).

The inventory of VV-Contractions for clitics is given in (40). Combinations requiring intervening h or a homorganic semivowel are omitted.

(40)   Verb plus Clitic VV Outputs

       a. deletable stem-final V plus full V

            /A + e/, /ɪ + e/   → e

            /A + i/, /ɪ + i/   → i

            /A + ɑ/, /ɪ + ɑ/   → ɑ

       b. full V plus full V

            /ɑ + e/   → e

            /ɑ + i/   → i

            /i + i/   → i   (if no h)

            /ɑ + ɑ/   → ɑ

       c. deletable stem-final V plus short V

            /ɪ + ə/, /A + ə/   → ə

       d. full V plus short V

            /ɑ + ə/   → æ

Except in (40.d), the clear generalization is that the clitic V surfaces while the verb-final V is deleted. An example of (40.a) is dative LoImpfP i-jáll-\a-s 'he goes for him' with LoImpfP /-jállA-/. Examples of (40.b) are ï-ŋɣi-\kmæt 'he killed them-Fe', t-ə̀ŋɣ-\e 'she killed him', and ï-ŋɣa-\Ø-hi 'he killed me', all from PerfP -ə̀ŋɣa-, and i-s-álh-\e 'he made him weep' from LoImpfP -s-álha-. (40.c) occurs in imperative nɑzz-\ə́d ... 'sell ...' (with following NP).

The aberrant case is (40.d), as in PerfP Ø-osǽ-\dd 'he came' from -òsɑ-. This pattern is limited to verbs with following Centripetal clitic -\ə́dd (and therefore affects /ɑ/ before a CC cluster). Since the Centripetal clitic also has positional allomorphs without an initial V (e.g. -\d), it may be that Ø-osǽ-\dd is really from /osɑ-\dd/ with no VV-Contraction at all. In either case, the shortening to æ is probably due to a special shortening rule rather than to VV-Contraction itself. This could be taken care of formally by modifying Presuffixal ɑ-Shortening (§3.4.9.1). However, the phonology here is less than transparent.

In my data (which are not complete for all dialects), the 3rd person object clitics other than 3MaSg -\e, namely 3FeSg -\et, 3MaPl -\en, and 3FePl -\enæt, are among the clitics that impose word-penultimate accent on an unaccented word. In other words, they behave accentually like the corresponding postconsonantal allomorphs, e.g. 3FeSg -\tæt and 3MaSg -\tæn. Technically, this means that these clitics have a true initial V that (along with the stem-final V) is "counted" in Default Accentuation. This corresponds to a possible historical scenario, whereby e.g. 3FeSg -\et derives from *-\æt. By contrast, 2nd person object clitics like 2FePl (i)-\kmæt allow antepenultimate default accent. Therefore either these clitics lack an initial V (though forcing the

preceding V to shift to i), or else they do have an initial V but undergo VV-Contraction prior to Default Accentuation.

3.2.3.4 Possible VV-Contraction with Pl prefix i-

In the analysis I prefer, such Sg/Pl nominal prefixal alternations as seen in Sg ǽ-jolɑ 'stepchild', Pl i-jól-ɑn are interpreted as alternations of a Sg prefix (here æ-) and a corresponding Pl prefix i-. However, there are two alternative analyses. One, not involving VV-Contraction, is that æ- (or any other prefixal V) becomes i **by ablaut** (i.e. by having the Sg prefixal V targeted by both a <H> vocalic melody and a V-lengthening ablaut component x̄). I reject this analysis, since the Sg/Pl prefixal alternation takes place not only when the Pl shows stem ablaut, but also when the stem is unchanged from Sg to Pl so the Pl is expressed solely by affixes.

There remains a possible third analysis whereby Pl prefix i- is added to, rather than replacing, the initial V of the Sg, which is therefore better considered to be part of the stem (rather than a Sg prefix ɑ-, e-, æ-, or ǝ-). This would entail a VV-Contraction rule, e.g. /i-æjolɑ-æn/→i-jo... I reject this analysis too. There are other reasons to segment Sg prefixes, specifically those with a full V (ɑ- or e-), since these reduce to 'æ- or 'ǝ- in certain syntactic positions by Prefix Reduction, as in ɑ-bæ̀mbæra 'Bambara man' (reduced 'æ-bæ̀mbæra, cf. Pl i-bæmbæ̀ra-tæn). Such stems contrast with others that begin with a true stem-final V that shows no reductions or Sg/Pl prefixal shifts, e.g. árab 'Arab (man)' and Pl àrab-æn 'Arabs'.

In short, while mildly tempted by the alternatives, I consider Pl i- to be a simple prefix, replacing Sg vocalic prefixes.

3.2.3.5 Summary of VV-Contraction processes

The treatment of underlying VV combinations in the preceding sections is summarized in (41), showing contractions, and (42), showing intervening h or homorganic semivowel. The summary is valid for T-ka and excludes some minor eastern and northern dialectal peculiarities mentioned above. Also excluded are the analyses of nominal Pl i- that were just considered but rejected in (§3.2.3.4, above), and cases of suffixal ɑ instead of æ that are not due to VV-Contraction as such, rather to ablaut-induced lengthening from /æ/ to ɑ.