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Tabaq: In a State of Flux

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Birgit Hellwig & Gertrud Schneider-Blum

1. Introduction

Tabaq – or ṯàànì nfɛ̀ɛ̀ [ṯàànì mbɛ̀ɛ̀], as is the emic expression – is one of several languages of the Kordofan Nubian language group.[1] It is the ancestral language of roughly 1800 people who call themselves ṯàànílì, sg.: ṯàànílṯù, and who speak the language to varying degrees of fluency. Their original settlement is in the north-western area of the Nuba Mountains of Sudan, an area they call ṯààŋ or ṯàànì nkùlṯúù [ṯàànì ŋgùlṯúù], i.e. 'mountain of the Tabaq people' (see fig. 1). During the past decades, virtually all Tabaq people have left their homeland and moved to different parts of the country. Nowadays we find groups of varying sizes not only in their homeland and Dillinj, but also in El Obeid, Kosti/Rabak, Khartoum, Gedaref, and Port Sudan.[2]

Many Tabaq people who are nowadays living in the Nuba Mountains are homecomers, i.e., they have spent considerable time away from Tabaq before returning there. Their close contact with the outside Arab world has left its cultural traces, possibly in the way they now construct their compounds and in the variety of food preparation. Their closest neighbors in former times lived at Kakada Mountain – called kɛ́ɛ́ṯɛ́ nkùlṯúù [kɛ́ɛ́ṯɛ́ ŋgùlṯúù] by the Tabaq – to the north of the Tabaq area. It is not known which language the Kakada people spoke at that time. By now, they have left their land and have merged with the Tabaq people, speaking Tabaq. The events that led to the integration of the two groups are part of Tabaq

1 Tabaq is an under-described language, and the data for this paper comes from our fieldwork conducted since 2011 with Tabaq speakers in Khartoum. This fieldwork was done within a larger documentation project whose team members also include Khalifa Jabreldar and Khaleel Bakheet Khaleel (see their separate contributions forthcoming in future volumes of this journal). We would like to take the opportunity to sincerely thank ELDP (Endangered Languages Documentation Programme) for funding this project, and the following speakers of the Tabaq community for their various contributions to the project: Nasraldeen Hamad Khaleel Ismail, as well as Abdallah Shuuna Deliima, Aghbash Ragayag Ali Hamad, Barsham Ali Abdalbein, Birra, Gabir Ibrahim Daldoum Gabir, Gadim Alnour Karko, (the late) Khamees Bakheet Khaleel, Mahanna Kambo, Omar Awad Saboon Ali, Salman Khaleel Ismail, and Zireiga Mahmoud Dood. We also like to thank the participants of the Nilo-Saharan Conference for their fruitful discussion and are indebted to Angelika Jakobi for her critical comments.

2 See JABRELDAR's forthcominh study for a sociolinguistic profile of Tabaq.

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Fig. 1: Location of Tabaq in Sudan

oral history, and we have recorded several accounts told by different Tabaq elders. These events are presented as having happened in the distant past, beyond living memory, but further investigation is needed to verify and date these events.

For many generations, the Tabaq – and the Kakada – have had intensive relationships with the Arabic cattle nomads who regularly pass through the area. It is likely that this contact influenced methods of cattle farming: rural Tabaq people have so-called house cows, i.e. dairy cows staying near the house that give easy access to fresh milk. The Tabaq community claims that before this contact, all cattle were kept far away from the settlements, but further historical and ethnographic research is needed to examine the extent of such cultural influence. Linguistically, we can say that the terms for cows in their different stages are borrowed from Arabic, e.g., màḏ̈múùn 'two year old cow,' ɟáḏ̈àʕ 'three year old cow,' ṯ̈ɛ́nì 'four year old cow.'

This history of contact with the outside world, and especially with speakers of Arabic, has also impacted on the Tabaq language. In particular, this sociolinguistic situation has had two types of influence. On the one hand, the language has changed through borrowing from

Arabic. These borrowings are largely on the lexical level: Tabaq uses many Arabic words (which tend to not be adapted phonologically to the Tabaq sound system), but so far we have not found evidence for grammatical borrowing, or for the borrowing of sounds into native Tabaq vocabulary. On the other hand, Tabaq shows signs of attrition. Our sociolinguistic study shows evidence for the language being severely endangered,[3] and even those who are still able to speak Tabaq rarely do so.

As a consequence, speakers feel exceptionally insecure when discussing their language, and elicited and natural recordings show considerable signs of variation. For example, in the area of phonetics and phonology, there is variation in the realization of vowel quality and length, tones, and consonants. This observation reflects an instability that goes beyond expected, 'normal,' language change: Tabaq is in a constant state of flux, not to say it is caught in a deadly undertow. Virtually all older Tabaq people are bilingual, with Arabic being the main means of communication and t̪àànì nfɛ̀ɛ̀ only being used rarely. The youngest generation hardly speaks Tabaq at all.

This contribution has two aims: to give an overview of Tabaq phonology and tonology, and to exemplify the instability of the underlying system, which we consider a sign of language attrition, as there is no evidence for a convergence towards Sudanese Arabic phonology or stress patterns. We describe the consonants (section 2), vowels (including vowel harmony and vowel length) (section 3), and tones (section 4), and then conclude with a few remarks (section 5). Consonantal and tonal realizations show variation between different speakers as well as within the speech of a single speaker, but it is within the vowel system that Tabaq's "state of flux" is most striking. We have therefore singled out section 3 in order to illustrate and explore in detail some of the variation and instability that affects the Tabaq language.

2. Tabaq consonants

The Tabaq language has, to our knowledge, 19 consonantal phonemes. Apart from the four nasals /m, ɲ, n, ŋ/, the three liquids /r, ɾ, l/ and the glides /j/ and /w/, these are stops – voiced /b, d̪, ɖ, ɟ, g/ and unvoiced /t̪, ʈ, k/ – and fricatives /f, ʃ/.

3 See Jabreldar, *A Sociolinguistic Study of Tabaq*.

Table 1: Tabaq consonant phonemes

		Labial/ Labiodental	Dental/ Alveolar	Post-alveolar/ Retroflex	Palatal	Velar
Stop	vl		t̪	ʈ		k
	vd	b	d̪	ɖ	ɟ	g
Fricative	vl	f			ʃ	
Nasal	vd	m	n		ɲ	ŋ
Trill	vd		r			
Flap	vd			ɾ		
Lateral	vd		l			
Glide	vd	w			j	

The evidence for some of the phonemes is weak, and requires further investigation. The palatal plosive /ɟ/ is attested in a handful of cases only, and may eventually prove to be an allophone of /j/. The retroflex flap /ɾ/ arose diachronically from the /-lɖ-/ and /-lʈ-/ sound combinations, and these original pronunciations are still attested synchronically in some idiolects. We nevertheless posit /ɾ/ as a phoneme on the basis of some words such as kʷákáɾá 'hyena,' where no synchronic variation is attested and where the current state of our morphological knowledge would rule out an underlying form such as *kʷákálɖá or *kʷákálʈá. Finally the glides /w/ and /j/ constitute phonemes, but with a restricted distribution, and with predictable occurrences in some environments.[4] Note also that the obstruents can occur labialized (as in kʷákáɾá 'hyena'), and it is not yet entirely clear whether or not these labialized consonants should be analyzed as phonemes.

A certain asymmetry in the system lets us suspect that the fricatives used to be stops in the first place. Our motivation for this assumption is the absence of voiceless counterparts for /b/ and /ɟ/. We find some evidence in noun phrases consisting of two nouns that are combined by a genitival linker N, a homorganic nasal. The general rule is that the genitival linker causes the following consonant to become voiced, as illustrated in the table below with examples for each voiceless consonant.

Table 2: Genitival constructions

	1st noun		2nd noun		genitive	
t̪	ɖíʈú	'sleep'	t̪úú	'place'	[ɖíʈú nd̪úú]	'sleeping place'
ʈ	t̪àànîì	'Tabaq'	ʈúúl	'home'	[t̪àànì ndúúl]	'Tabaq home'
k	ɖíʈú	'sleep'	kúúl	'house, hut'	[ɖíʈú ŋgúúl]	'sleeping room'
f	t̪ùùlɖù	'desert date'	fúú	'tree'	[t̪ùùlɖù mbúú]	'desert date tree'

4 See Hellwig & Schneider-Blum, *Towards a Grammar of Tabaq*.

1st noun			2nd noun		genitive
ʃ	t̪íí	'cow'	ʃúú	'udder'	[t̪íí nʒúú]	'cow's udder'

After the genitival linker, the voiceless plosives /t̪, ʈ, k/ are realized as the voiced plosives [d̪, ɖ, g], thus neutralizing the voicing contrast in this environment. The voiceless fricative /f/, however, contrary to our expectation, does not become the voiced fricative [v] after the linker, but changes its manner of articulation and is realized as the voiced plosive [b]. Since the voiceless equivalent of /b/ is /p/, it is possible that historically there was a */p/ in the language that has been weakened to /f/.

The situation with regard to the voiceless fricative /ʃ/ is different: it becomes the voiced fricative [ʒ], as expected, not the voiced plosive [ɟ]. Note that [ʒ] is not part of the phonemic system, since it only occurs in predictable environments. Unlike the case of /f/, there is thus no synchronic evidence to prove that /ʃ/ originated from */c/. At the moment, the only language-internal suggestion for such a diachronic origin is the asymmetry in the consonantal system: the voiced stop /ɟ/ does not have a synchronic voiceless counterpart */c/. There is evidence in the related languages Kudur and Kururu[5] that their fricative /ʃ/ originated from */c/. It is thus possible that future historical-comparative research will find comparable evidence for the diachronic origins of Tabaq /ʃ/.

The phone [ʒ] also occurs in the combination [ɲʒ], which is an allophone of /ɲ/, occurring in free variation with it for some speakers. There is furthermore the lateral voiceless fricative [ɬ] that occurs in free variation with the voiced lateral in utterance final position, as in [ʃíːɬ] ~ [ʃíːl] 'chief,' or the velarized lateral [ɬ] that is occasionally attested after the open-mid back vowel occurring before the suffix -d̪ʊ, as in [kʊ́ɬd̪ʊ̀] ~ [kʊ́ld̪ʊ̀] 'eye.'

The contrast between voiceless and voiced obstruents is neutralized in consonants following the homorganic nasal (as in the case of the genitive linker above). Also, the multi-functional suffix -d̪ʊ provokes a regressive voicing assimilation:

Base		Singular		Plural	
bʊ́kɛ́	'stealing'	bʊ̀gɛ́d̪ʊ̀	'thief'	bʊ̀kɛ̀rí	'thieves'
ʃʊ́lkɛ́	'cowardice'	ʃʊ̀lgɛ́dʊ̀	'coward'	ʃʊ̀lkɛ́rɪ	'cowards'

Table 3: Neutralization of voicing

Not considered here are those consonants that entered the language via loanwords from Arabic, like /x/, /h/, etc. Note that Arabic loanwords tend to be integrated morphologically (e.g., they receive Ta-

5 See Jakobi, *Kordofan Nubian*; for Kururu (Tagle) see also Ibrahim & Huttenga, "The Phoneme System of Tagle," p. 106.

baq plural markers or TAM inflectional morphemes), but not phonologically: they tend to be pronounced as they are in Arabic.

3. Tabaq vowels

The vowel inventory of Tabaq consists of seven vowels that are divided into three front and three back vowels plus one central vowel. The phonetically occurring [ə] is not considered a phoneme, as its occurrence is predictable.[6]

Table 4: Tabaq vowel phonemes

	Front	Mid	Back
Close	i		u
Near-close	ɪ	ʊ	
Open-mid	ɛ	ɔ	
Open	a		

The front and back vowels are exemplified with some words below (note that true minimal pairs are rare because of tonal differences):

Table 5: Tabaq front and back vowels (exemplified)

Front vowels	Gloss	Back vowels	Gloss
ɖíí	'drink'	kúúl	'bull'
ɖíɪ́	'work'	kʊ́ʊ́l	'house'
ɖɛ̀ɛ̀	'is lying down'	kɔ́ɔ́l	'well/hole'
kʷíì	'magician'	ɖ̰úú	'shelter'
kʷíɪ́	'horse'	ɖʊ̀ʊ̀	'leather'
kʷɛ́ɛ̀	'April dance'	ɖɔ́ɔ́	'slaves'

The existence of numerous minimal and especially near-minimal pairs proves beyond doubt that Tabaq has 7 vowel phonemes. However, Tabaq's "state of flux" is nowhere clearer than in the actual realization of these vowel phonemes. Different speakers tend to produce different realizations, and even the same word pronounced by the same speaker at different occasions often yielded differences in pronunciation and perception. Vowels intruded into the acoustic space of other vowels, thus blurring the boundaries between them. There are some tendencies, though: recording minimal pairs produces a more distinctive articulation than recording the same word in a non-contrastive context, long vowels are more target-like than short vowels (i.e., they come closer to the intended or expected re-

6 The vowel [ə] occurs in two environments. First, it is a free variant of all short vowels in unstressed syllables, compare e.g. [ákʊ̀r] ~ [ákə̀r] 'inside,' [ɖɛ̀ɛ̀rɪ̀m] ~ [ɖɛ̀ɛ̀rə̀m] 'sleep!' or [kʷákáɽá] ~ [kʷákəɽá] 'hyena.' Second, it occurs as a free variant breaking up sequences of obstruents and liquids, e.g., [kàmblà] ~ [kàmbə̀là] 'camel' or [kʊ̀fɽà] ~ [kʊ̀fə̀ɽà] 'lung.' Given the predictabilty of its occurrence, we consider [ə] to be not phonemic.

alization), and short root vowels in turn are more target-like than short suffix vowels (and other final short vowels).

However, these tendencies also mean that, in many cases, vowel quality is difficult to determine and open to interpretation. The word for 'snake' is a good case in point: it is recorded roughly 20 times. Most of the recordings have the high back vowel [u] occurring twice, i.e. the word is pronounced [kúŋgú]. However, several of the recordings show the word with the near-close vowel [ʊ], i.e. the word is pronounced [kúŋgʊ́], and we even have recordings with two different vowels, i.e., [kúŋgʊ́]. In the absence of minimal pairs, how can we interpret such variation? We have approached this challenge in the following way. One source of information was frequency information, assuming that the more frequent pronunciation tends to reflect the underlying phoneme (/kúŋgú/ in this case). This was coupled with our developing knowledge of Tabaq phonotactics: short vowels have a tendency to become centralized, not peripheral (i.e., we can easily explain [kúŋgʊ́] as a centralized realization of the underlying /kúŋgú/, but not the other way round). These two sources of information allow us to make a fairly confident interpretation of the underlying quality of the first vowel. For the second vowel, however, there is an additional complication: it is often realized extra-short, and its quality is very difficult to ascertain. In fact, its interpretation depends on whether or not we can assume that Tabaq has vowel harmony. We will investigate this question, and the different options, further below.

Given the considerable variation in the realization of vowels, we decided to systematically note their first and second formants. This enabled us to visualize the acoustic space for each vowel phoneme (excluding the uncontroversial vowel /a/), thus gaining a better understanding of their typical distribution and boundaries. We started with listing the formants of long vowels, as their quality was easier to determine. Most of the words were recorded several times, and we included between 1 and 3 realizations of each word. We compared the realizations of different speakers, but for this paper, we restrict ourselves to showing variation within the speech of one speaker only. The speaker is NHK, an elderly male (born in 1948) who lives in Khartoum. The chart below illustrates the acoustic space for his long front vowels.[7] Visible are three more or less distinguishable

7 This graph is a visual representation of the first (= F1) and second formants (= F2), which are bands of frequencies (measured in Hertz). Plotting these two formants against each other gives us information about the quality of a vowel (see table 4 for a comparable, but more abstract, representation of the vowel space). F1 on the y-axis represents the open/close axis, i.e., it gives us information about the relative openness/closeness of the mouth. More open vowels (such as /ɛ/ in this chart) have a higher F1 than close vowels (such as /i/ in this chart). And F2 on the x-axis represents the front/back axis, i.e., it gives us information about the position of the tongue relative to the front or back of the mouth. Front vowels (such as /i/ in fig. 2) have a considerably higher F2 than back vowels (such as /u/ in fig. 3), but even among

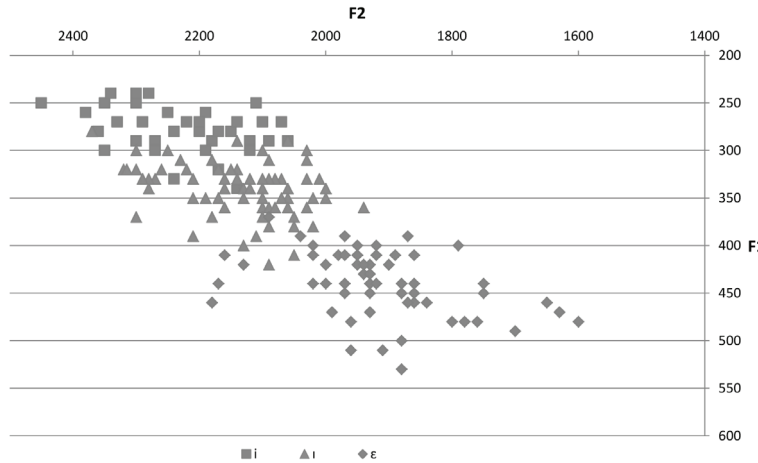


Fig. 2: Speaker NHK, front vowels (long)

fields that correspond to the high front vowel /i/ (square), the near-close vowel /ɪ/ (triangle), and the open-mid vowel /ɛ/ (rhombus) (see fig. 2).

It is notable that each vowel occupies a large area: there is no central area for any of the vowels within which the majority of its realizations would occur. Furthermore, we can observe overlapping zones, i.e., first, an area where close and near-close front vowels both occur, and, second, an area where near-close and open-mid vowels occur. These overlapping zones create a practical problem for analyzing those words that occur only infrequently in our database, and for which we do not have a minimal pair that contrasts in vowel quality: if their realization in our few recordings happens to fall into the zone of overlap, how can we determine their vowel quality?

A similar picture emerged when we charted the formants for the long back vowels: note that the area for the high back vowel /u/ (square) is clearly distinguishable (at least for this speaker), but there is considerable overlap between the areas for the near-close back vowel /ʊ/ (triangle) and the open-mid back vowel /ɔ/ (rhombus) (see fig. 3). Again, it is noticeable that the acoustic space for each vowel is fairly large.

As a next step, we looked at the formants of short root vowels. We only illustrate the back vowels here, because we intend to compare them to back vowels occurring in suffixes (see section 3.1). But first, compare the realization of long back vowels (fig. 3) with that of short back vowels (fig. 4). Although it is still possible to differentiate

the front vowels there are differences: a vowel like /i/ is produced more to the front than a vowel like /ɛ/, and thus has a higher F2.

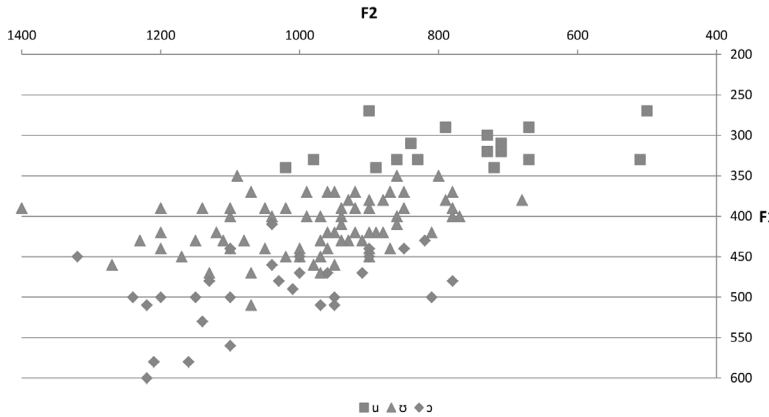


Fig. 3: Speaker NHK, back vowels (long)

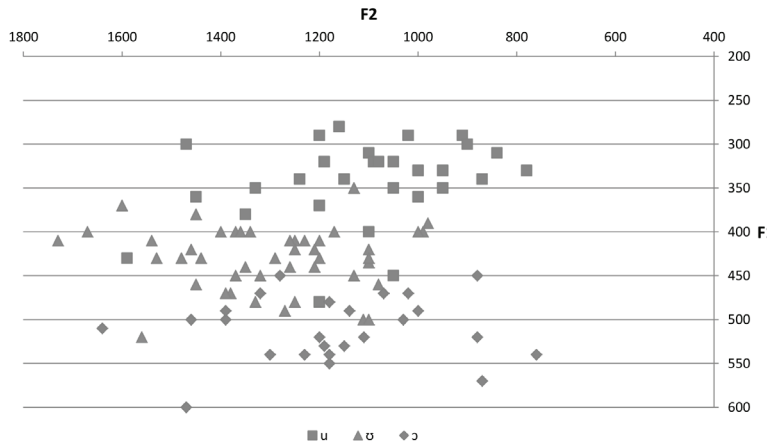


Fig. 4: Speaker NHK, back vowels (short, root)

three zones, the picture is even less clear than for the long vowels: all vowels extend over a larger acoustic space, and the boundaries between them are fuzzier (see e.g. the outliers of /u/ realized far outside the expected zone).[8] We also note another phenomenon: the F2 of the short vowel phonemes shows considerable centralization (encroaching into the acoustic space of true central vowels such as [ə]).

3.1 Vowel harmony

Many languages of the Nuba Mountains have a system of vowel harmony, where the vowels within a word harmonize in terms of Advanced Tongue Root (e.g., Kordofanian languages, also attested

8 The occurrences of [kúŋgú] vs. [kʊ́ŋgʊ́] 'snake' are not incorporated here.

for the Kordofan Nubian languages Kudur and Kururu[9]), or vowel copying (attested, e.g., for the Kordofan Nubian language Karko[10]). Vowel harmony affects roots (which tend to contain vowels from one set only) and affixes (which tend to have two allomorphs, depending on the set of vowels that occurs in the root they attach to).

Given these areal and genetic patterns, our initial assumption was that Tabaq would also exhibit such a system. Investigating this assumption, however, proved trickier than expected. We will outline the issues and challenges with the help of the multi-functional affix -ḍ̈ʊ.[11] When listening to words with this suffix, we thought we detected instances of vowel harmony, i.e., we sometimes heard this suffix as -ḍ̈u after roots containing the close vowels /i/ or /u/, but as -ḍ̈ʊ after roots containing any other vowels (as is the case with the words listed in table 6). However, there were many other cases where we heard -ḍ̈ʊ regardless of the quality of the preceding root vowels. Such perceptual differences even occurred for multiple instances of the same word (comparable to the variation in [kúŋgú], [kúŋgʊ́] and [kʊ́ŋgʊ́] 'snake,' introduced in section 3 above). We therefore decided to explore the phonetic realizations of such suffix vowels in more detail, which eventually allowed us to pinpoint the source of our confusion: suffix vowels are usually short and occur in unstressed syllables, and this is an environment where Tabaq speakers inevitably centralize vowels (discussed in this section) and realize them extra short (see section 3.2).

Table 6: Questionable vowel harmony of the suffix -ḍ̈u/-ḍ̈ʊ

Root-suffix	English gloss
[úgú–ḍ̈ú]	'friend'
[íl–ḍ̈ù]	'rat species'
[t̪úún–ḍ̈ú]	'blind person'
[t̪ɔ̀ɔ̀–ḍ̈ʊ̀]	'child'
[ʊ́ŋgʊ́l–ḍ̈ʊ́]	'elephants'
[ɪ́l–ḍ̈ʊ́]	'woman'

We divided the roots into those containing close vowels (/i/ or /u/) and those containing other vowels. Then we measured the formants of the vowel in the suffix -ḍ̈ʊ. Fig. 5 illustrates the result: the squares represent the realization of -ḍ̈ʊ after close vowels, and the triangles represent its realization after other vowels. As was the case for short root vowels (see fig. 4), all vowels are centralized. But the resulting pattern with regard to vowel height is somewhat inconclusive. On

9 Angelika Jakobi, p.c.; Ibrahim & Huttenga, "The Phoneme System of Tagle," pp. 107f.
10 Angelika Jakobi, p.c.
11 It marks the singular or singulative, the plural or plurative, the diminutive or collective; double marking is also possible (cf. also Dimmendaal, "Number Marking and Noun Categorization in Nilo-Saharan Languages.").

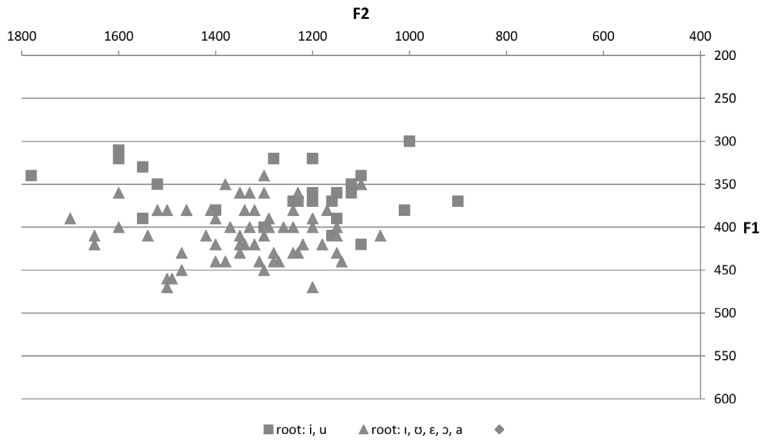


Fig. 5: Speaker NHK, back vowels (short, suffix)

the one hand, we observe that F1 tends to be lower when -ḍ̈ʊ comes after close vowels. This would argue for the existence of vowel harmony (i.e., -ḍ̈ʊ would have an allomorph -ḍ̈u that occurs after close vowels). On the other hand, however, we observe that this is only a tendency: there is a considerable area of overlap, with many realizations not having the expected lower F1. And when comparing fig. 5 to fig. 4, we see that these realizations extend well into the acoustic space of the short vowel /ʊ/. This finding would argue against the existence of vowel harmony.

We then approached the issue of vowel harmony from another angle. There are reasons to believe that the suffix -ḍ̈ʊ is related to the synchronic word íḍ̈ù 'person.' This form is still attested in a number of words, especially in a large number of ethnonyms. For example: [kùùlíḍ̈ù] 'Hijerat person'; [míírɪ̀nɪ́ḍ̈ù] 'Miri person.'

These words probably originated in a genitival construction of the form: ethnonym + genitival linker N- + íḍ̈ù 'person' (literally, 'person of ethnonym'). Synchronically, however, the form (n)ɪḍ̈ʊ 'person (of)' is a suffix. This suffix is disyllabic, and – impressionistically – its vowels seemed less prone to phonetic reduction than was the case with -ḍ̈ʊ. We again divided the roots into two sets (those with the close vowels /i/ or /u/, and those with other vowels), and we then measured the formants for both the front and the back vowel in the suffix (n)ɪḍ̈ʊ. The results are shown in fig. 6 (for the front vowel) and fig. 7 (for the back vowel): the squares represent the suffix after a close vowel, the triangles the suffix after another vowel.

Both vowels are centralized (as shown by their F2), while their height (as shown by their F1) corresponds to the heights of [i, ɪ] (for the front vowel) and [u, ʊ] (for the back vowel), with a concentration of tokens in the [ɪ] and [ʊ] heights, respectively. More strikingly,

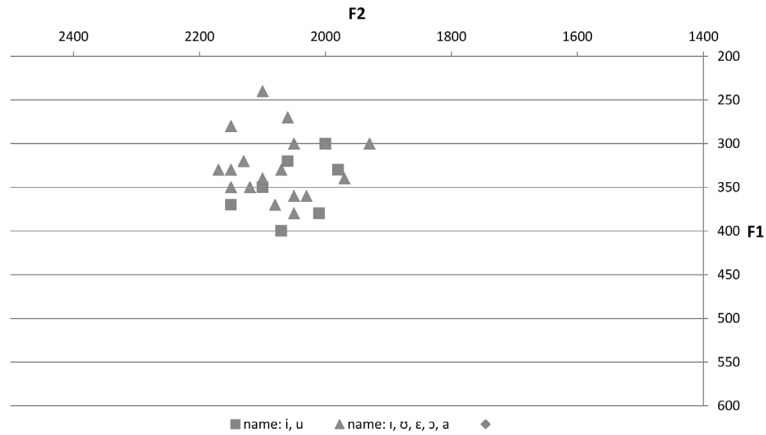


Fig. 6: Speaker NHK, front vowel (name + genitive + -iḍu/-ɪḍʊ)

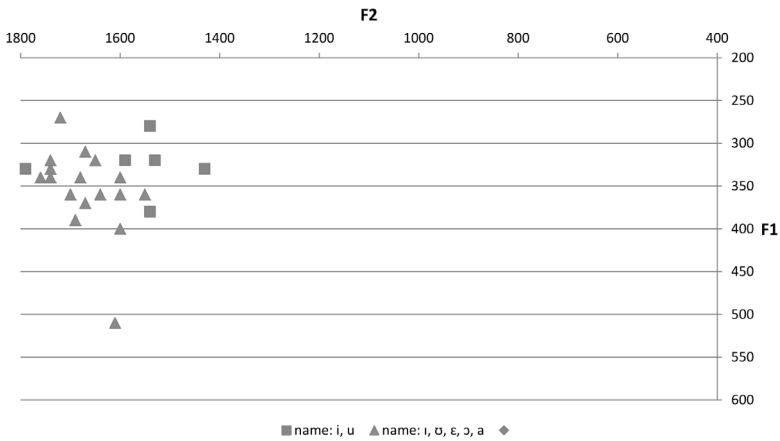


Fig. 7: Speaker NHK, back vowel (name + genitive + -iḍu/-ɪḍʊ)

though, there is no recognizable distribution pattern with respect to the two sets of roots: the F1 of vowels following the close vowels /i/ or /u/ is not lower. This means that there is no evidence for vowel harmony, and that the suffix should be analyzed as -(n)ɪḍʊ (in the case of ethnonyms and some other nouns) and -ḍʊ (in the case of most nouns), independent of the vowels in the preceding root. Note that the diachronic source íḍù 'person' contains the close front vowel /i/, while the suffix -(n)ɪḍʊ 'person (of)' contains the near-close vowel /ɪ/. This change is triggered by the process of grammaticalization: most suffixes now occur in unstressed positions, which trigger the centralization of vowels.

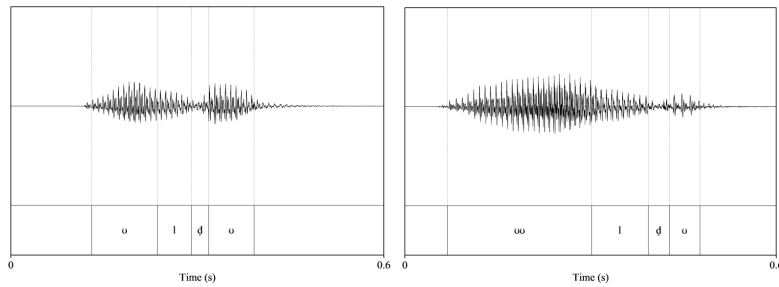
Assuming that there is no synchronic vowel harmony, we still need to explain those cases where we perceived the occurrence of close front vowels (as in the words in table 6 above) or the higher

likelihood for a close vowel to occur after a root containing close vowels (as depicted in fig. 5). It is possible that these constitute remnants of an earlier vowel harmony system. However, in the present-day language, the assimilated pronunciations occur in free variation with their non-assimilated counterparts. This free variation is even attested in carefully articulated speech, i.e., it would be difficult to argue that there is an underlying vowel harmony system that becomes neutralized in fast speech.

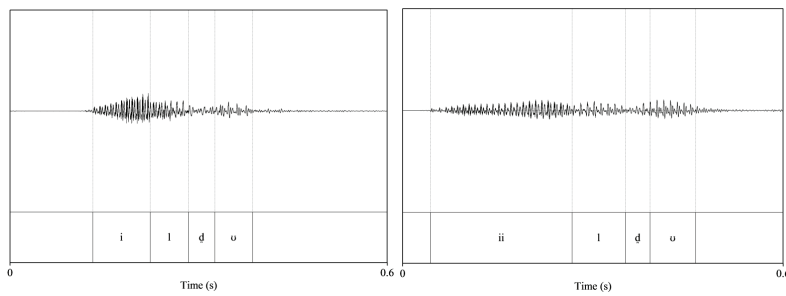
Furthermore, there are two additional observations that are of relevance to this discussion. First, we observe cases of an unexpected assimilation of root vowels to suffix vowels (whereas in a vowel harmony system, it would be the suffix vowel that should change in accordance with the root vowel). For example, the benefactive suffix -nɖí has a close vowel, and it triggers the sporadic assimilation of vowels in the preceding root, e.g., the root fɪ́ 'say' is realized with either its phonemic near-close vowel (as [fɪ́–nɖí]) or with an assimilated close vowel (as [fí–nɖí]) in this context. And second, we observe that front vowels tend to be raised when they follow a palatal consonant, e.g., ʈ̟ɔ́ɔɲì 'children' can alternatively be realized as [ʈ̟ɔ́ɔɲɪ̀] or as [ʈ̟ɔ́ɔɲì]. Both observations cannot be explained easily as cases of vowel harmony, but rather as local phenomena where adjacent sounds assimilate to each other. For the present-day language, we thus assume that all assimilations in vowel height constitute such ad hoc assimilations or local phenomena, not remnants of an earlier vowel harmony system.

3.2. Vowel length

Our investigation into vowel quality and vowel harmony led us to realize that final short vowels (usually suffix vowels, but also root vowels) are not only centralized, but also extra short. Before discussing this phenomenon, we introduce the issue of vowel length. Tabaq distinguishes phonemically between short and long vowels, as illustrated by means of the (near) minimal pairs in figs. 8 and 9. These charts visualize typical length differences between short and long vowels. They illustrate a spoken word (visualized as a waveform) as it unfolds over time (along the horizontal axis). We have extracted exactly 0.6 seconds for each uttered word (to make the lengths more easily comparable), and segmented and labeled each sound underneath the waveform. The boundaries between sounds are indicated by means of dashed vertical lines. Even without measuring the time, it is obvious that the long vowels take up considerably more time than the short vowels. And when measuring the time, it can be seen that long vowels are about twice as long as short



Figs. 8a, b: Contrastive vowel length, exemplified with úlɖ̪ú 'breast' vs. úúlɖ̪ù 'mouths'



Figs. 9a, b: Contrastive vowel length, exemplified with ílɖ̪ù 'rat species' vs. íílɖ̪ù 'bodies'

vowels: the short first vowel in úlɖ̪ú 'breast' and ílɖ̪ù 'rat species' is 0.09 seconds long, while the long first vowel in úúlɖ̪ù 'mouths' and íílɖ̪ù 'bodies' is 0.18 seconds long.

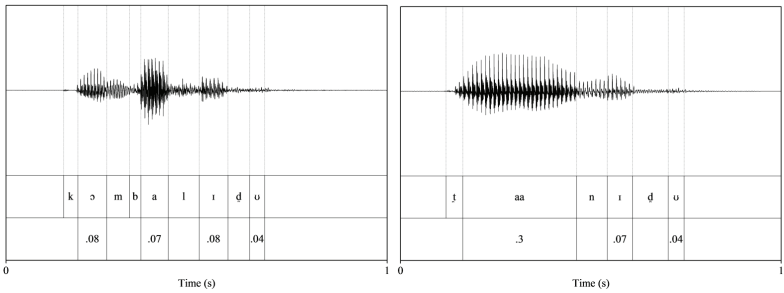
While differences in vowel length are clearly phonemic in polysyllabic nouns, length is mostly neutralized in monosyllables. Here the vowel is always realized long, as in e.g. [bʊ̀ʊ̀l] 'dog' or [ɖɔ́ɔ̀m] 'thorn.' With the help of suffixes, however, their phonemic length becomes visible, e.g., the plural forms of these two words are bʊ́lɪ̀ 'dogs' and ɖɔ́ɔmɪ̀ 'thorns,' respectively. This different behavior suggests that [bʊ̀ʊl] 'dog' has an underlying short vowel, while [ɖɔ́ɔ̀m] 'thorn' has an underlying long vowel.

On the phonetic level, we find more than two vowel lengths. Consider e.g. kɔ́mbálíɖ̪ù 'Kambal person' and ʈ̪àànɪ́ɖ̪ù 'Tabaq person' and pay special attention to the length of the final vowel.

In both cases, the final vowel is realized much shorter than any preceding short vowels. It is also not uncommon for a speaker to drop the final vowel altogether,[12] giving us many variant realizations such as [kíʈ̪ú] ~ [kíʈ̪] 'door.' As a general rule for Tabaq, we can state that vowels in word final and unstressed syllables are realized extra short, or sometimes dropped altogether.

Most vowels in this position are suffix vowels, and this fact has had repercussions for our investigations into vowel quality and vow-

12 Dropping of the final vowel is common in the closely related language Karko; cf. Hamdan & Jakobi, "Number marking on Karko Nouns."



Figs. 10a, b: Phonetic vowel length

el harmony. Assuming that Tabaq had a system of vowel harmony in the past, the extremely short duration of suffix vowels presumably did not leave speakers time to reach the target values, and is thus responsible for their centralization, and their clustering in the [ɪ] and [ʊ] areas (as reported in section 3.1). However, this is only a speculation: synchronically, we cannot recover any vowel harmony system, since short duration, centralization and convergence in the areas of the near-close vowels are attested even in careful speech.

4. Tone

This final section introduces the tonal system. Tabaq has two level tones (high H, low L) that can be combined in one syllable to give a falling (HL) or rising (LH) contour. Note that such contour tones tend to be attested on long vowels only. Some minimal pairs are given below:

H(H)		HL		L(L)		LH	
kúlú	'fish'	kúlù	'stick'	kùlù	'porridge'		
ákú	'stay'	ákù	'inside'	àkù	'sit down'	àkú	'be sitting'
kɛ́lɛ́	'write'	kɛ́lɛ̀	'red'			kɛ̀lɛ́	'coloured'
kíṯú	'door'			kìṯù	'fruit type'		
wá	'sing'			wà	'want/like'		
kúú	'maternal clan'	kúù	'shelter/ fence'				
kʷíí	'open'	kʷîi	'kujuur'	kʷìì	'go up'		

Table 7: Tonal minimal pairs

There are a number of processes that affect the realization of an inherent lexical tone in the case of those words where the tonal melody is HL or LH: these melodies only surface in specific environments, but are realized as level tones in other environments. This section illustrates the most pervasive of these processes. There is a large group of mono- and disyllabic words that have an underlying HL

pattern, which is retained in some syntactic contexts, but realized as [HH] in others. Table 8 illustrates the attested distribution with the help of the noun ʊ́n̪ɪ̀ 'water.' We assume that all such alternating words are underlyingly HL because there are no restrictions on tone patterns in context 1 (i.e., HL, HH, LL and LH are all attested), while there are no HL and LH patterns attested in context 2.

Table 8: Contexts of tonal change

Context 1 = HL		
in isolation	ʊ́n̪ɪ̀	'water'
as final member of a noun phrase	kálɛ́ nʊ́n̪ɪ̀	'tears (lit. eyes GEN.water)'
as direct object	ʧí ʊ́n̪ɪ̀ kúúlɛ̀m	'she boiled the water'
with instrumental/ directional suffix -kà	ʧí kùbáàj ʊ́n̪ɪ̀kà ɪ̀ɪŋɛ̀m	'he filled the glass with water'
Context 2 = HH		
as non-final member of a noun phrase	ʊ́n̪ɪ́ nʊ́ʊ̀l	'well area (lit. water GEN.mouth)'
as subject	ʊ́n̪ɪ́ kúúlɛ̀m	'the water boiled'
with locative suffix -(ʊ)r	ʧí ʧíkàà ʊ́n̪ɪ́r bárgʊ̀m	'he pushed him in the water'

The vast majority of HL words follow the above pattern. However, there are a few exceptions; and the largest group of exceptions are those Arabic loanwords that receive a HL pattern in Tabaq, e.g., ʃáàj 'tea' or gálàm 'pen': these loanwords tend not to alternate, and are usually realized HL in both contexts.

Phonetically, the HH variants of these words are either realized HH or extra-HH, in free variation. Because of this extra-HH realization, some contexts reveal an apparent three-tone system, as illustrated below with the help of the frame íŋ X kɛ́ɛ́ŋ 'this X is.good.'

Table 9: Phonetic realization of underlying tone

Phonemic tone	Example	Gloss	Realization
LL	kʊ̀lʊ̀	'porridge'	íŋ kʊ̀lʊ̀ kɛ́ɛ́ŋ
HH	ʊ́mn̪ʊ́	'flower'	íŋ ʊ́mn̪ʊ́ kɛ́ɛ́ŋ
HL	kʊ́lʊ̀	'stick'	íŋ kʊ́lʊ́ kɛ́ɛ́ŋ ~ íŋ kʊ́lʊ̋ kɛ́ɛ́ŋ

This extra-HH realization is a reflection of the underlying HL melody: in careful speech across word boundaries, HL patterns tend to start at a much higher pitch than level H tones. Fig. 11 illustrates such a typical pitch contour for the noun kʊ́lʊ̀ 'stick.' It is a visual representation of the recorded sentence ʊ́ kʊ́lʊ̀ ʃʊ́mɛ́ŋgáɽʊ́ ʃʷá 'you threw a stick and it is now located there,' as it unfolds over time (along the horizontal axis). We have segmented and labeled each word, and the boundaries between the words are indicated by means of vertical

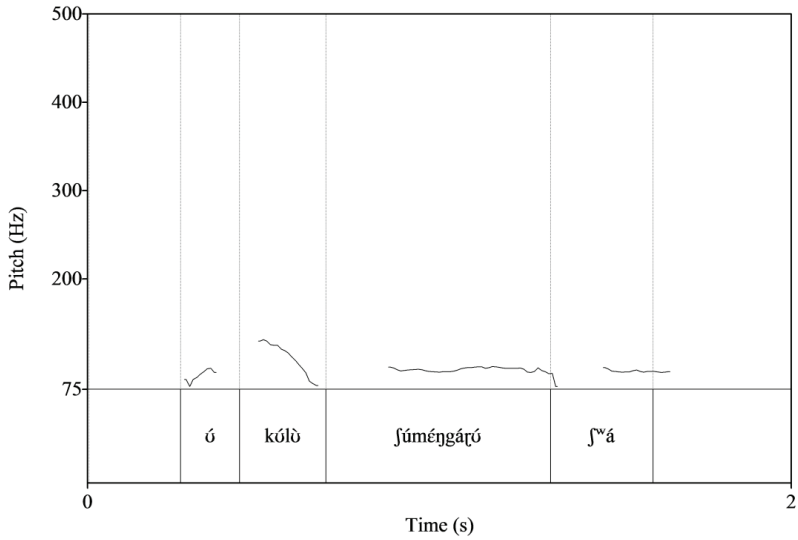


Fig. 11: kúlʊ̀ 'stick' in object position

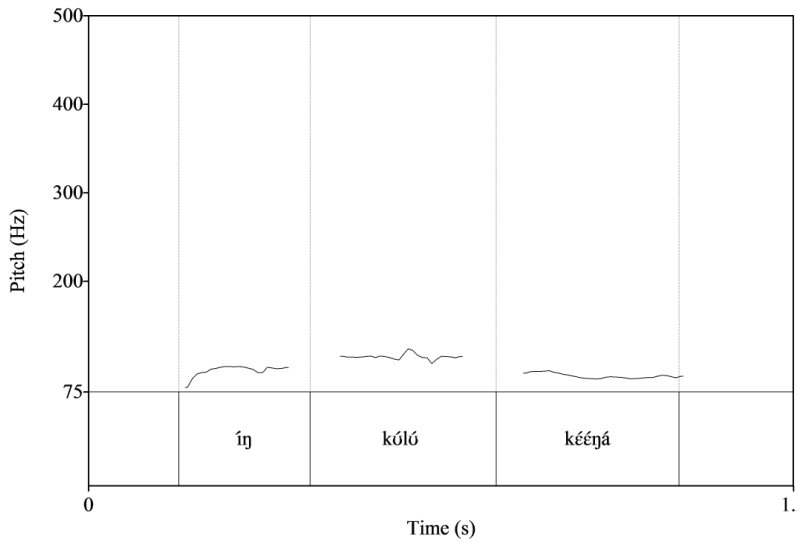


Fig. 12: kúlʊ̀ 'stick' in subject position

lines. Above each word, we have extracted the pitch contour (measured in Hertz). The word kúlʊ̀ 'stick' occurs in direct object position (where it retains its HL pattern): it is preceded by the H-toned subject 2SG pronoun ú, and followed by the H-toned verbs ʃúmɛ́ŋgáɽʊ́ 'having thrown down' and ʃʷá 'it is located.' Note that the HL pattern starts at a considerably higher pitch (when compared to that of the level H tones) to yield [kʊ́lʊ̀].

Now compare this to fig. 12: here, kúlʊ̀ 'stick' occurs in the subject position (where it becomes HH) of the sentence íŋ kúlú kɛ́ɛ́ŋá [íŋ

kűlű́ kɛ́ɛ́ŋá] 'this stick is really good.' It is preceded by the H-toned proximal demonstrative íŋ 'this,' and is followed by the H-toned non-verbal predicate kɛ́ɛ́ŋá 'it is really good.' Despite the fact that all elements carry H tones, we see a marked raise in the pitch of kúlú 'stick,' i.e., its realization in this particular example reflects its underlying HL pattern.

We have presented here a discussion of the underlying tonal system as attested in the speech of older speakers. But in actual spoken language, tones tend to merge: the intervals are only well established in careful speech in short utterances, and they tend to get blurred in longer utterances. This is true even for older speakers. Furthermore, when we compare recordings from older and younger speakers of the same words and utterances, we notice quite a few tonal differences. It is presently not clear whether the differences reflect a re-analysis of the tonal system by the younger speakers, or whether they reflect a decline of the language and the advent of a semi-speaker variety of Tabaq.

5. Concluding remarks

This paper has introduced the consonants, vowels, and tones of Tabaq. It has focused on the vowel system in order to exemplify a pervasive aspect of the language: the fact that Tabaq is an endangered language that shows signs of deterioration. The vowel system consists of 7 vowel phonemes, but the variation in their pronunciation is considerable, and phonemic contrasts are not necessarily reflected in the actual phonetic realizations. We assume that these are all signs of language attrition. Note that this situation has analytic consequences, as it is often difficult to determine the vowel quality beyond any doubt. In fact, it is necessary to resort to a number of strategies to determine vowel quality: to record contrastive words rather than words in isolation (as this often triggers a more careful articulation), and to have a large number of recordings of a word (as this allows us to resort to information about frequencies).

It is likely that the general situation of the Tabaq people, as outlined in the introduction, is responsible for the language being in a state of flux, having a long history of migration, interacting and socializing with Arabic speaking people most of the time, and thus adopting Arabic as the main means of communication. Nevertheless, the Tabaq people feel as one big family and identify themselves as a close-knit society, although – as one elder said – you will not be able to find two speakers of Tabaq who speak the language alike.

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