A grammar of Mundabli : a Bantoid (Yemne-Kimbi) language of Cameroon

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CHAPTER 2

Phonology

2.1 Tone

The tone system of Mundabli is characterized by four level tones and a number of contour tones. Tones are taken at their surface values. The only tonal process attested is low tone spread (see §3.4.2). Each syllable in Mundabli carries contrastive tone. Although nouns and verbs are nearly identical in their segmental setup, they differ considerably regarding their tonal behavior. While nouns generally retain their lexical tones, the tone patterns of verbs change depending on factors such as their syntactic position and the tense/mood/aspect in which they occur.

The remainder of the current section is organized as follows. Section 2.1.1 gives an overview of the tonal inventory, §2.1.2 deals with the phonetic realization of tones, and §2.1.3 briefly introduces noun and verb tone patterns. Noun and verb tone patterns are discussed in more detail in §3.2. An overview of all verb tone patterns is provided in Chapter 8.

2.1.1 Tonal inventory

The tone bearing unit in Mundabli is the syllable. There is no distinction in vowel length and the same tone combinations are possible in open and closed syllables. Mundabli has neither downstep nor phonetic downdrift. It is a "discrete level" language, i.e. tones are always realized at approximately the same pitch.

The four level tones are referred to as low (L), mid (M), high (H) and superhigh (S). Mundabli also has contour tones, namely a low-high rising tone (LH) and three falling tones: mid-low (ML), high-mid (HM) and high-low (HL). While the other contour tones are relatively common, HL is rare and occurs mainly in loanwords. Table 2.1 contains near-minimal pairs illustrating all level and contour tones.[1]

prose	symbol	diacritic	example	gloss
low	L	x̀	**kù**	'rope'
mid	M	x̄	**kū**	'ratmole'
high	H	x́	**kú**	'home.LOC'
superhigh	S	x̋	**kű**	'belly'
low-high	LH	x̌	**kǔ**	'grab' (clause-final)
mid-low	ML	x̄̀	**kū̀**	'clap' (clause-final)
high-mid	HM	x̄́	**kɔ́**	'wisdom'
high-low	HL	x̂	**gâŋ**	'gown'

Table 2.1: Tonal diacritics

The tone of a syllable is marked by diacritics on the vowel. In closed syllables, part of the tone is realized on the final sonorant. However, in the current orthography, the tone of a syllable is always marked on the (first) vowel, as e.g. in **gɔ̀ŋ** 'spear' or **dʒwǎn** 'star', except when a syllable consists of a syllabic nasal, which then receives the tone mark.

2.1.2 Phonetic realization of tones

Whereas the mid, high and superhigh tones are phonetically level in both final and non-final position, the low tone is level in non-final position but phonetically falling before a pause. As this alternation is completely predictable, the low tone is always transcribed with a grave accent. A superhigh tone may be realized as LH when it is preceded by a low tone. In this case, it is transcribed as low-high rising tone. This process, which I refer to as low-tone spread, is described in §3.4.2.

Contour tones may occur in non-final position or before a pause. Their pronounciation is generally the same in final and in non-final position. Only the mid-low falling tone (ML) is realized as a mid tone (M) in non-final position unless followed by a low tone (L), so that the distinction between the ML and the M is neutralized in this context. In this case, I also transcribe it as a mid tone (M). Only before a pause or a low tone does the mid-low falling tone contrast with the mid tone, which is realized as phonetically level in final and non-final position. The nouns **tɔ̄** 'horn' and **tō** 'day', for example, bear different

[1] Verbs are given with the tone pattern specific for non-final position. In this and the following example though, verbs are given with the tone pattern characteristic of clause-final position, see §3.2.2.2 for details.

tones when pronounced in isolation, but their tone patterns are identical when they are followed by a determiner as in **tɔ̄ kɔ́** 'the horn' and **tō kɔ́** 'the day'.

Table 2.2 and Table 2.3 contain approximate pitch values of all level and contour tones for a male (Yung Donatus Kungmba) and a female (Ntie Jacqueline Kemba) speaker, respectively. The values represent approximations based on measurements of several tokens for each tone pattern. Where the pitch changes, the values for the beginning and end point of the phonetic contour are given, separated by the greater-than symbol '>'.

prose	symbol	final pitch	non-final pitch	example	gloss
low	L	115 > 100	115	**kù**	'rope'
mid	M	130	130	**kū**	'ratmole'
high	H	145	145	**kú**	'home.LOC'
superhigh	S	170	170	**kű**	'belly'
low-high	LH	115>145	115>145	**kě**	'fetch firewood'
high-mid	HM	145>125	145>125	**tí**	'pumpkin leaf'
mid-low/mid	ML/M	145>100	130	**kɛ̀**	'hand'
high-low	HL	145>100	145>100	**sê**	'front part of house'

Table 2.2: Approximate pitch values of level and contour tones for Yung Donatus Kungmba

prose	symbol	final pitch	non-final pitch	example	gloss
low	L	220>170	220	**kù**	'rope'
mid	M	260	260	**kū**	'ratmole'
high	H	280	280	**kú**	'home.LOC'
superhigh	S	325	325	**kű**	'belly'
low-high	LH	220>280	220>280	**kě**	'fetch firewood'
high-mid	HM	310>220	310>220	**tí**	'pumpkin leaf'
mid-low/mid	ML/M	260>200	260	**kɛ̀**	'hand'
high-low	HL	260>200	260>200	**sê**	'front part of house'

Table 2.3: Approximate pitch values of level and contour tones for Ntie Jacqueline Kemba

In both speakers, although more clearly in the pronunciation of the female speaker (see Table 2.3), the level tones are not evenly distributed across the pitch range. The M and H tone are somewhat huddled up around the center of the pitch range with a relatively small distance between them. The difference amounts to something around 15 Hz for Yung Donatus Kungmba (male) and 20 Hz for Ntie Jacqueline Kemba (female). This leaves a bigger distance between these two 'central' tones and the 'outlying' tones, L and S. The distance between level L and M amounts to ca.15 Hz for Yung Donatus Kungmba and 40 Hz for Ntie Jacqueline Kemba and the distance between H and S is around 25 Hz for Yung Donatus Kungmba and around 45 Hz for Ntie Jacqueline Kemba.

Furthermore, comparing the phonetic pitch of the ML and the HL falling tones, I could not discern a significant pitch difference between them in either of the two speakers. While ML is quite common, HL is rare and occurs mainly in loanwords. My consultant Yung Donatus Kungmba says that the two do sound different, i.e. that HL starts at a higher level and ML at a lower level. Even if ML and HL are phonetically identical, there is a phonological difference. ML is realized as level M in non-final position whereas HL is always realized as HL. Therefore, the two are transcribed as ML and HL, respectively. In general, the tone patterns are realized at a slightly lower pitch when the onset is voiced and slightly higher when the onset is voiceless.

2.1.3 Noun and verb tone patterns

Nouns and verbs show different tonal behavior. While nouns are lexically specified for noun class and retain their tonal patterns in all contexts (with the exception of Gender 9/10 nouns, cf. §3.2.1), each verb belongs to one of three tone classes (A,B and C). The tone of all verbs belonging to the same tone class is identical in a given context. However, the tonal pattern of verbs depends on various factors, such as tense, aspect, syntactic position etc. (see Chapter 8 for details).

2.2 Consonants

Mundabli has a rich consonant inventory consisting of 21 consonant phonemes. These phonemes are presented in Table 2.4.

Consonant glide sequences and nasal consonant sequences are not included in Table 2.4 because they are analyzed as sequences rather than complex segments, cf. §2.2.3. The consonants in Table 2.4 are sorted according to place (columns) and manner (rows) of articulation. Voicing is distinctive in plosives, but the labial plosive **b** does not have a voiceless equivalent, thus leaving a gap in the inventory in the place of **p**.[2] The phonemes **tʃ** and **dʒ** are analyzed as alveo-palatal affricates rather than palatal stops. Their pronunciation differs phonetically from that of the palatal stops [c] and [ɟ] which are attested in the Mufu variety. The Mundabli affricates are realized further to the front

	Labial	Alveolar	Alveo-Palatal	Velar	Labial-velar
Plosives		**t**		**k**	**kp**
	b	**d**		**g**	**gb**
Fricatives	**f**	**s**	**ʃ**		
Affricates		**ts**	**tʃ**		
		dz	**dʒ**		
Nasals	**m**	**n**	**ɲ**	**ŋ**	[**ŋm**]
Approximants		**l**	**y**, [**ɥ**]		**w**

Table 2.4: Inventory of consonant phonemes

than the Mufu palatal stops (, namely at the back of the alveolum) and they are released with more friction. Furthermore, the alveolar affricates **ts** and **dz** in Mundabli correspond to the palatal plosives **c** and **ɟ** in Mufu cognates, not the alveo-palatal affricates **tʃ** and **dʒ**.

While most consonants in the chart are represented by IPA symbols, a few of the symbols in the chart do not adhere to IPA standards. Sounds in Table 2.4 which are represented by more than one consonant, such as **kp** or **tʃ** represent single phonemes. Orthographic conventions are described in detail in §1.2.4.

Table 2.4 includes two sounds in square brackets, namely the labiovelar nasal [ŋm] and the labial-palatal glide [ɥ]. They are included in order to give a representative overview of the sound system, but the square brakets indicate that they are not part of the phoneme inventory. The labiovelar nasal [ŋm] only occurs in NC clusters with labiovelar plosives preceded by homorganic nasals. It is predictable and not phonemic. The rare labial-palatal glide [ɥ] is also not phonemic. It only occurs in a few lexical items such as **ywǒŋ** [ɥǒŋ] 'snake' and **ɲwə̀n** [ɲɥə̀n] 'bird'. In all cases the labial-palatal glide [ɥ] can be analyzed as a sequence of a palatal consonant and a labial glide.

2.2.1 Consonant phonemes and allophonic variation

This section contains descriptions of all consonant phonemes and their allophones. Since the morphology of Mundabli is mostly isolating, allophonic variation is restricted. Common allophonic alternations are spirantization of stops before the high vowels **i** and **u**, devoicing of coda sonorants and glottalization of final nasals. While the current section describes the realization of phonemes, allophonic variation as such is dealt with in §2.2.5.

[2]The lack of a voiceless equivalent of **b** is an areal phenomenon. It has been attested in numerous other languages in the area, e.g. Mungbam, Ajumbu, Koshin, Naki, see Watters and Leroy (1989) and Good et al. (2011). The same gap is attested in most Beboid (former Eastern Beboid) languages, such as e.g., Noni (Hyman 1981: 17–18), Kemezung (Cox 2005), Mungong (Boutwell 2011), Nchane (Boutwell and Boutwell 2014), in Ring languages (Aghem (Hyman 1979) etc.) and in Grassfields languages (e.g. Limbum (Fransen 1995)). For a brief discussion of this phenomenon and a map of the world-wide distribution of languages with the same gap in their consonant inventory, see Maddieson (2011).

2.2.1.1 Plosives

With the exception of the labial-velar plosive **kp**, voiceless plosives are slightly aspirated. Both voiced and voiceless plosives have a fricative release when they precede the [+ATR] high vowels **i** and **u**. This phenomenon is best seen as a side-effect of the friction which occurs throughout the vowels **i** and **u** (see §2.3.1).

The consonant t The voiceless alveolar plosive **t** is well represented by the IPA symbol [t] although its articulation varies slightly depending on the context. When it occurs in the onset, it is slightly aspirated. Examples are **tɛ̄** 'walking stick', **tɔ̀** 'horn' and **táŋ** 'buy'.

Before the high vowels **i** and **u**, **t** is more strongly aspirated than otherwise. Before **i**, it can be realized with slight affrication [t^{s}] as in **tǐ** 'his/her father' which is realized as [**t^{h}ǐ**] or as [**t^{s}ǐ**] or **tí** [**t^{s}í**] 'bed side of house'[3]The setup of traditional Mundabli houses generally follows a strict pattern. The entrance is on the front side. The side close to the entrance usually contains a bench. The bed is usually found on the side far from the door, and the back side inside of the house often serves as storage room for pots and other things. The noun **tí** refers to the side containing the bed. (see also §2.2.5.1 and §2.3.1). The friction in this case is weaker than in the affricate phoneme **ts**. The phonemic affricate **ts** never precedes the vowel **i**. Before **i**, the distinction between **ts** and **tʃ** is neutralized and both are realized as **tʃ** (see also §2.2.1.2). The phoneme **t** occurs in the syllable coda only in ideophones such as **kăt** which expresses that fact that something has been completely destroyed. When **t** stands in coda position, the closure is not released. E.g., **kăt** is phonetically realized as [kăt˺].

The consonant k The voiceless velar plosive **k** is pronounced [k]. Examples are **kàm** 'monkey, sp.', **kɛ́** 'leg' and **kɔ̀ŋ** 'love' (v.). Before the high vowels **i** and **u**, it is more strongly aspirated and before **u** it can be slightly spirantized, in which case it has a bilabial release an is realized [k^{ɸ}] as e.g., in **kù** [k^{ɸ}ù] 'clap' or in **kű** [k^{ɸ}ű] 'belly'. Just like **t**, **k** is found in coda-position only in ideophones like e.g., **dʒěk** 'sound of something breaking, collapsing'. In this case, the closure has no audible release and e.g. **dʒěk** is phonetically realized as [**dʒěk**˺].

The consonant kp The voiceless labial-velar plosive **kp** is pronounced [k͡p]. It is a consonant with two simultaneous places of articulation. Unlike the other voiceless plosives, it is not aspirated. The labial and the velar closure are released nearly at the same time. Due to the two simultaneous closures, it is

[3]The setup of traditional Mundabli houses generally follows a rather strict pattern. The entrance is on the front side. The side close to the entrance contains a bench. The bed is usually found on the side far from the door, and the back side inside of the house often serves as storage room for pots and other things. The noun **tí** refers to the side containing the bed.

sometimes realized with a nonpulmonic, slightly ingressive airstream. Examples are **kpā** 'shoe', **kpɨ́n** 'elbow' and **kpɨ́** 'die'.

The consonant b The voiced bilabial plosive **b** is well-represented by IPA [b]. Examples of words containing **b** are **bɔ̀** 'bag', **bʊ́ŋ** 'ash' and **bɨ́ŋ** 'roll' (v.). Besides the most common pronunciation [b], **b** has two allophones. It is slightly affricated and pronounced [b$^{\beta}$] when it precedes the [+ATR] high front and back vowels **i** and **u**. This affrication is best explained as a side-effect of the friction occurring throughout the vowels **i** and **u**. Further, **b** may be softened and pronounced as approximant [ʋ] in fast speech, especially when it occurs in a non-prominent position, e.g. in the onset of the determiners of Class 2 or Class 8 (both **bɔ́**) when they follow a noun.

The consonant d The plosive **d** is well-represented by IPA [d]. It is a voiced alveolar plosive. Examples of **d** are **də̌** 'machete' (in Pidgin 'cutlass'), **dàm** 'dream' (n.) and **dʊ́** 'remain'.

The consonant g The voiced velar plosive **g** is comparable to IPA [g]. Examples of words containing **g** are **gɪ̄gɪ̄** 'beard', **gɔ̀ŋ** 'spear' and **gɪ́** 'put'.

The consonant gb The consonant **gb** is a voiced labial-velar stop. It is well-represented by IPA [g͡b]. It is a single complex segment with two simultaneous closures. The two closures are released almost simultaneously. Sometimes a slight non-pulmonic ingressive airstream is created. Examples of **gb** are **gbàn** 'in-law', **gbɛ̀** 'pus' and **gbʊ̀** 'fall'.

2.2.1.2 Affricates

The consonant ts The voiceless alveolar affricate **ts** corresponds to IPA [t͡s]. Although it is represented by two symbols, it is not a sequence of phonemes but one complex segment. Examples of words containing the affricate **ts** are **tsà** 'mud', **tsʊ̌** 'witchcraft' and **tsɪ́** 'pass the night'.

The consonant tʃ The affricate **tʃ** is a complex alveo-palatal segment. It is articulated between the alveolus and palate and given the label "alveo-palatal". It is well represented by IPA [t͡ʃ] although it is a bit more fronted than e.g., English or German **tʃ**. Examples of words containing **tʃ** are **tʃʊ́ŋ** 'ear', **tʃɪ̄tʃɪ̄** 'heel' and **tʃʊ́** 'come'. Before the high vowel **i**, it does not contrast with the alveolar affricate **ts**.

The consonant dz The voiced alveolar affricate **dz** is pronounced [d͡z]. When it is preceded by a nasal, it is sometimes weakened and is pronounced [z], even in careful pronunciation. This happens e.g. in nouns like **ndzɨ̀** ([ndzɨ̀]∼[nzɨ̀])

'sheep'). Like **ts**, **dz** is not attested before the high front vowel **i**. Further examples of words containing **dz** are **dzē** 'cutting grass' (Thryonomys swinderianus), **dzān** 'mosquito' and **dzúŋ** 'quarrel' (v.).

The consonant dʒ The voiced alveo-palatal affricate **dʒ** is well-represented by IPA [d͡ʒ]. Like **tʃ**, it is articulated further in front than English **dʒ**. Examples of **dʒ** are **dʒǐ** 'dog', **dʒǔ** 'goat' and **dʒì** 'put'.

2.2.1.3 Fricatives

The consonant f The consonant **f** corresponds to IPA [f]. It is a voiceless labio-dental fricative, not different in pronunciation from its English equivalent. Examples of words containing **f** are **fɔ̄** 'head', **fúfù** 'beans, sp.' and **fʊ̀ŋ** 'catch crabs (by hand)'.

The consonant s The consonant **s** is comparable to IPA [s]. It is a voiceless alveolar fricative. Examples of **s** are **sə̀** 'clothes', **sɔ̃ŋ** 'flue' (in Pidgin 'catarrh') and **sɛ̀** 'laugh'.

The consonant ʃ The consonant **ʃ** is comparable to IPA [ʃ], i.e. it is a voiceless alveo-palatal fricative. Like the other alveo-palatal consonants, it is a bit more fronted than e.g., the English or the German fricative **ʃ**. Examples of **ʃ** are **ʃī** 'chicken' (in Pidgin 'fowl'), **ʃǎŋ** 'sand' and **ʃɔ̃ŋ** 'peel' (v.).

2.2.1.4 Sonorants

Sonorants which occur in syllable-final position, i.e. the nasals **m**, **n**, **ŋ** and **l** are usually devoiced towards the end, often to such an extent that especially **n** tends to be overheard by someone who is not familiar with the language.

The consonant m The bilabial nasal **m** is pronounced like IPA [m] when it occurs in the syllable-onset, as in **mɔ̀** 'person', **mā́n** 'name' or **mà̀l** 'slide' (v.). When it is in the coda, as in **tʃɛ̃́m** [**tʃɛ̃́m̥**] 'axe', **dà̀m** [**dà̀m̥**]'dream' (n.) or **mɔ̃́m** [**mɔ̃́m̥**] 'suck', the nasal is slightly devoiced towards the end. The nasal **m** is also attested as the initial consonant of an NC-cluster in nouns, where it is followed by a labial obstruent, as in **mbɔ̀ŋ** 'cow', **mfɔ̄** 'slave' or **mbɔ̄** 'spark'.

The consonant n The alveolar nasal **n** is well-represented by IPA [n]. In syllable final position, it is devoiced more than other nasals. Examples of words containing **n** in syllable- and word-initial position are **nɪ́** 'my/our mother', **nɪ́ŋ** 'thing' and **nà̀m** 'work' (v.). Examples of **n** in syllable- and word-final position are **yā́n** [yā́n̥] 'leaf', **tsǎn** [tsǎn̥] 'arm' and **gà̀n** [gà̀n̥] 'go'. The nasal **n** also occurs in NC sequences where it precedes alveolar obstruents, as in the words **ndʒà̀n** 'Mundabli', **ntà̀ŋ** 'hawk' and **ndām** 'tear(s)'.

The consonant ɲ The consonant **ɲ** corresponds to the palatal nasal [ɲ] in the IPA. Examples of **ɲ** are **ɲā** 'thirst', **ɲǎŋ** 'bush fowl' and **ɲóŋ** 'hum'. The nasal **ɲ** is the only nasal which is not attested in coda position. The nasal **ɲ** is attested in monomorphemic NC-clusters followed by alveo-palatal consonants, e.g. in **ɲdʒɔ́m** 'things', **ɲtʃé** 'armpit' and **ɲʃő** 'bird, sp.'.

The consonant ŋ The consonant **ŋ** is a velar nasal, pronounced like IPA [ŋ]. While it is often found in initial NC sequences preceding a velar stop, it is only attested without a following obstruent in the syllable-onset of a handful of words. In all but one of these, namely **ŋà** 'boast', it is followed by a labial glide, as in **ŋwà** 'write' and **ŋwǎŋ** 'xylophone'. The velar nasal commonly occurs in syllable-final position, e.g. in **sɔ̌ŋ** 'basket' (used for carrying seeds and collecting wild vegetables), **tɔ́ŋ** 'ram' (male sheep) and **láŋ** 'be happy'. The final devoicing attested in other final nasals is not quite as strong in velar nasals. Examples of **ŋ** in NC-clusters are **ŋgə̄** 'quarter head', **ŋgàŋ** 'hill' and **ŋkə́** 'spoon'.

The consonant l The lateral approximant **l** is pronounced [l]. It occurs in syllable-initial position in around thirty items, which is comparable to the frequency of e.g. **kp** in the onset. Examples are **lɔ̀ŋ** 'snot', **lùŋ** 'suffering' and **lɔ̄** 'go to the bush'. Whereas **l** is also attested in syllable-final position, my database contains only 15 cases of syllable-final **l**, which is a very low number compared to any of the final nasals. Examples of syllable-final **l** are **kwə̌l** 'crocodile', **fyĭl** 'whirlwind' and **tàl** 'pull'. The liquid **l** is the only non-nasal consonant which occurs in coda position in words other than ideophones. Just like the nasals, it is devoiced towards the end when it occurs in utterance-final position. Younger speakers have a tendency to drop final **l**. The omission commonly goes along with a fronting of the vowel. E.g., the verb **tàl** 'pull' is pronounced **tɛ̀** by younger speakers (see §1.1.4 for details).

The consonant y The palatal approximant **y** corresponds to IPA [j]. The symbol <y> was chosen here to avoid confusion. The use of <y> to represent a palatal approximant is standard in the area, while <j> commonly represents IPA [dʒ]. The palatal glide **y** is usually realized as an approximant, e.g. in the words **yǎn** 'leaf', **yɔ́m** 'bed' and **yɔ̄** 'throw'. However, when it precedes the high vowel **i**, the glide is spirantized and pronounced with friction, just like the vowel itself, e.g. **yí** [ji̯i̯] 'eat'. The palatal glide also occurs as the second consonant in CG-clusters, as in **fyĭl** 'whirlwind', **fyɛ́n** 'feast' and **lyàŋ** 'flicker' (of tongue). The palatal glide is not found in coda position.

The consonant w The labial-velar approximant **w** corresponds to IPA [w]. It commonly occurs in syllable-initial position or as the second element in syllable-initial CG-clusters. Examples of words containing the onset **w** are **wɛ́**

'bark, peel', **wấn** 'valley' and **wɔ̀ŋ** 'squish'. Examples of words containing CG-onsets with **w** are **gwɛ̀n** 'feathers', **dʒwǎn** 'star' and **kwɔ̀ŋ** 'snore'. The labial-velar glide is not found in coda position.

2.2.2 Minimal pairs

The selected (near) minimal pairs in Table 2.5 and Table 2.6 illustrate that the choice between the opposed sounds is not predictable from their context. Rather than comparing all consonant phonemes with each other, I present examples comparing only similar sounds, i.e. sounds of the same or a similar place and manner of articulation and sounds that are likely to be connected through sound changes, based on areal patterns of common sound changes. Where relevant, I also include NC sequences and consonant-glide clusters in the comparison. Verbs are given in the unmarked P0 tense (see §8.5.1) unless otherwise specified. In some cases the imperative form of a verb was chosen in order to create a (near) minimal pair.

consonants	examples	gloss	examples	gloss
t/k	**tấn**	'refuse'	**kấn**	'lack'
t/d	**tɔ̄**	'horn'	**dɔ̄**	'beans'
t/ts	**tǎn**	'Fly!' (IMP)	**tsǎn**	'arm'
t/tʃ	**tám**	'send'	**tʃấm**	'axe'
t/nt	**tāŋ**	'Buy!' (IMP)	**ntàŋ**	'hawk'
k/kp	**kɛ̀**	'hand, fingers'	**kpɛ̀**	'pot'
k/g	**kū**	'bone'	**gù**	'fire'
k/gb	**kɛ̀**	'hand, fingers'	**gbɛ́**	'wind'
k/tʃ	**kɛ̀**	'hand, fingers'	**tʃé**	'women'
k/ŋk	**kā**	'Fry!' (IMP)	**ŋkà**	'corn beer'
kp/b	**kpó̱**	'week'	**bó̱**	'shoulder'
kp/g	**kpű**	'wooden bowl'	**gù**	'fire'
kp/gb	**kpɛ̀**	'pot'	**gbɛ́**	'wind'
kp/kw	**kpā**	'shoe'	**kwā**	'frog'
kp/ŋmkp	**kpɔ̀ŋ**	'bulky part of head'	**ŋmkpɔ̌ŋ**	'stool (wooden)'
b/d	**bɔ̀**	'bag'	**dɔ̄**	'beans'
b/g	**bɛ̄**	'count'	**gɛ̄**	'corn'
b/gb	**bɔ̀**	'bag'	**gbɔ̄**	'house'
b/mb	**bān**	'waist'	**mbàn**	'fence'
d/g	**dūo**	'poison'	**gùo**	'grind'
d/dz	**dɔ̄**	'beans'	**dzɔ̄**	'hides'
d/dʒ	**dàn**	'container'	**dʒàn**	'connect pipes'
d/nd	**dàn**	'container'	**ndàn**	'branch'
g/gb	**gɛ̄**	'corn'	**gbɛ̄**	'pus'
g/gw	**gɔ̀ŋ**	'spears'	**gwɔ̀ŋ**	'open'
g/ŋg	**gâŋ**	'gown'	**ŋgàŋ**	'hill'

consonants	examples	gloss	examples	gloss
gb/gw	**gbḗ**	‘wind’	**gwɛ̀n**	‘feathers’
gb/mŋgb	**gbằŋ**	‘Be spoiled!’	**mŋgbằŋ**	‘cheek’
ts/tʃ	**tsɛ̀**	‘pots’	**tʃé**	‘women’
ts/dz	**tsɛ̀**	‘pots’	**dzē**	‘cutting-grass’ (Thryonomye swinderianus)
ts/dʒ	**tsű**	‘hit’	**dʒû**	‘word’
ts/nts	**tsă**	‘shake a non-empty hollow object’	**ntsă**	‘cricket’
tʃ/dʒ	**tʃū**	‘iron’	**dʒû**	‘word’
tʃ/dz	**tʃé**	‘women’	**dzē**	‘cutting-grass’ (Thryonomye swinderianus)
tʃ/t	**tʃà̀ŋ**	‘cackle’	**tấŋ**	‘buy’
tʃ/ntʃ	**tʃé**	‘women’	**ntʃē**	‘clay pot’
dz/dʒ	**dzɔ̀**	‘house’	**dʒɔ̀**	‘bridge’
dz/ndz	**dzwɔ̀ŋ**	‘garden egg’	**ndzwɔ̌ŋ**	‘ball’
dʒ/ndʒ	**dʒà̀n**	‘connect water pipes’	**ndʒà̀n**	‘Mundabli’
t/s	**wù tăm**	‘S/he has shot.’	**săm**	‘Play!’ (IMP)
t/n	**tám**	‘send’	**nà̀m**	‘work’
t/l	**tǐ**	‘father’	**lī**	‘power’
b/m	**bɔ̀**	‘bag’	**mɔ̀**	‘person’
b/f	**bɔ̄**	‘stroll’ (n.)	**fɔ̄**	‘head’
d/l	**də̀**	‘see’	**lə̀**	‘do’
ts/s	**tsɔ̀**	‘rock dassie’	**sɔ̃́**	‘face’
tʃ/s	**tʃé**	‘women’	**sě**	‘Laugh!’ (IMP)
f/m	**fɔ̄**	‘head’	**mɔ̀**	‘person’
f/s	**fɔ̄**	‘head’	**sɔ̀**	‘meat’
f/ʃ	**fwɔ̀**	‘borrow’	**ʃwɔ̀**	‘detach’
f/mf	**fá**	‘shave’	**mfă**	‘inner stone in fire place’
s/ʃ	**sɨŋ**	‘knife’	**ʃɨ́ŋ**	‘fill up’
s/f	**sɔ̀**	‘meat’	**fɔ̄**	‘head’
s/n	**sām**	‘heart’	**nà̀m**	‘work’
s/l	**sɔ̀**	‘split’	**lɔ̀**	‘go to the bush’
s/ns	**sɔ̀**	‘meat’	**nsɔ̀**	‘basket, sp.’
ʃ/tʃ	**ʃű**	‘outer stone in fire place’	**tʃű**	‘come’
ʃ/nʃ	**ʃū**	‘rat’	**nʃù**	‘palm tree, sp.’
m/n	**mấn**	‘name’	**nằn**	‘Tie!’ (IMP)
m/ɲ	**mấn**	‘name’	**ɲán**	‘ant, sp.’
n/ɲ	**nằn**	‘Tie!’ (IMP)	**ɲán**	‘ant, sp.’

consonants	examples	gloss	examples	gloss
l/t	**láŋ**	'be happy'	**táŋ**	'buy' (IPFV)
l/d	**làŋ**	'reflect'	**dàŋ**	'cross'
l/n	**lɛ̀**	'get lost'	**nɛ̀**	'straighten'
w/y	**wấn**	'valley'	**yấn**	'leaf'

Table 2.5: Onset minimal pairs

consonants	examples	gloss	examples	gloss
l/n	**tàl** (∼**tè**)	'pull'	**tàn**	'fly' (v.)
m/n	**nàm**	'work' (v.)	**nàn**	'tie' (v.)
m/ŋ	**bőŋ**	'pick up'	**bőm**	'circumcise'
n/ŋ	**bấn**	'clean' (v.)	**bấŋ**	'close' (v.)

Table 2.6: Coda minimal pairs

2.2.3 Consonant-glide (CG) sequences

Consonant-glide sequences and nasal-consonant sequences (§2.2.4) are the only kinds of consonant clusters attested. In the current analysis, there is no advantage in interpreting consonant glide sequences as complex segments, i.e. labialized and palatalized consonants rather than consonant clusters. While historically, consonant-glide sequences in Mundabli were probably derived in most cases, synchronically they are often mono-morphemic. Consonant-glide sequences are attested only in stem-initial position.

2.2.3.1 Cw sequences

Sequences of a consonant plus a labial glide Cw are common in Mundabli lexical roots. Table 2.7 shows all attested Cw sequences. Table 2.7 shows that the glide **w** can follow nearly any other consonant. Exceptions are the labial-velar plosives **kp** and **gb**. A phonological sequence of a palatal and a labial glide **yw** is phonetically realized as labial-palatal glide **ɥ**, as in **ywo̱** [**ɥwo̱**] 'bee' . Similarly, a sequence of a palatal nasal and a labial glide **ɲw**, as in **ɲwàn** 'bird', is pronounced [**ɲɥàn**]; see §2.2. For an overview of phonemes and their phonetic realizations, consult the introductory section of §2.2.

Some of the sequences are more common than others. The sequence **ŋw** for example occurs only in three roots: **ŋwà** 'write', **ŋwăŋ** 'xylophone' and **ŋwā** 'colourful'. Examples and total of the attested Cw sequence are given in Table 2.8.

		Labial	Alveolar	Alveo-Palatal	Velar	Labial-velar
Plosives	vcl.				**kw**	
	vcd.	**bw**	**dw**		**gw**	
Fricatives	vcl.	**fw**	**sw**	**ʃw**		
Affricates	vcl.		**tsw**	**tʃw**		
	vcd.		**dzw**	**dʒw**		
Nasals		**mw**	**nw**	**ɲw**	**ŋw**	
Approximants				**yw**		
Lateral approx.						

Table 2.7: Attested Cw sequences

consonants	examples	number of attested examples
kw	**kwà** 'box', **kwɛ́n** 'ladder'	18
bw	**bwɛ̀** 'claw', **bwē** 'sky'	7
gw	**gwɛ̀n** 'feather', **gwàn** 'be sick'	3
sw	**swān** 'ceiling'	2
ʃw	**ʃwá** 'choke', **ʃwín** 'wink with eye'	6
tsw	**tswān** 'monkey, sp.'	3
tʃw	**ntʃwá** 'porridge', **tʃwín** 'answer'	2
dzw	**dzwàn** 'disease'	1
dʒw	**dʒwǎn** 'star', **dʒwēn** 'Missong'	2
mw	**mwɛ̀** 'be sad', **mwǐn** 'cat'	5
nw	**nwǎl** 'hippopotamus'	1
ɲw	**ɲwàn** 'bird', **ɲwán** 'beg', **ɲwɛ́** 'knee'	6
ŋw	**ŋwǎŋ** 'xylophone', **ŋwà** 'write'	4
yw	**ywǒŋ** 'snake', **ywɛ̌n** 'grass', **ywɛ̀** 'pour'	8

Table 2.8: Examples and total of Cw sequences

2.2.3.2 Cy sequences

The number of attested Cy sequences is slightly smaller than that of Cw sequences. The labial-velar plosives **kp** and **gb** cannot be followed by a palatal glide, just as they cannot be followed by a labial glide. Further gaps in the inventory are shown in Table 2.9. Examples and total of the attested Cy sequences are given in Table 2.10.

		Labial	Alveolar	Alveo-Palatal	Velar	Labial-velar
Plosives	vcl.		**ty**		**ky**	
	vcd.	**by**	**dy**		**gy**	
Fricatives	vcl.	**fy**		**ʃy**		
Affricates	vcl.			**tʃy**		
	vcd.		**dzy**	**dʒy**		
Nasals		**my**				
Approximants						
Lateral approx.			**ly**			

Table 2.9: Attested Cy sequences

consonants	examples	number of attested examples
ty	**tyə̀ŋ** 'tear, be torn'	2
ky	**kyé** 'look', **kyáǹ** 'clear throat'	8
by	**byə̀n** 'breast', **mbyíl** 'feces'	7
dy	**dyé̋** 'heal', 'cool down' (intr.), **ndyíŋ** 'edge'	2
gy	**gyə̀ŋ** 'heal' (tr./intr.), **gyə̀** 'steal'	4
fy	**fyíŋ** 'be new', **fyé̋n** 'feast'	8
sy		none
ʃy	**ʃyə̌** 'ankle'	4
tsy		none
tʃy	**tʃyé** 'know'	4
dzy	**dzyə̀ŋ** 'call people to help'	1
dʒy	**dʒyè** 'cook', **dʒyá** 'creep'	3
my	**myé̋** 'oil'	4
ɲ	**ɲɔ̀** 'language', **ɲə̌ŋ** 'bush fowl'	35
ŋy		none
ly	**lyə̀ŋ** 'flicker' (of tongue)	4

Table 2.10: Examples and total of Cy sequences

2.2.4 Nasal-consonant (NC) sequences

Nasal-consonant (NC) sequences in Mundabli occur in three contexts:

1. Nominal stems belonging to certain noun classes commonly start in an NC sequence.
2. The prefixal part (N-) of the infinitive marker (see section 8.4.1) forms part of a word-initial poly-morphemic NC sequence.
3. The preverbal form of the first person singular (1SG) pronoun **N=** is procliticized to the left edge of the verbal core,[4] creating a polymorphemic NC sequence at the beginning of the verb or of a preceding TAM marker.

Whereas NC sequences are common in noun stems, in verb stems they are not attested at all.

Stem-initial prenasalized onsets occur in nouns of the following Genders: 1/2 (62 of ca. 150, e.g. **ŋkŏŋ** 'chief', **nsōŋ** 'friend', **ŋkɔ̀m** 'hoe'), 3/10 (4 of 9, e.g. **ŋgàŋ** 'hill', **ŋkwīn** 'mountain'), 7/8 (125 without an NC sequence and 24 with an NC sequence, e.g. **ntsè** 'headpad', **ŋmgbɛ̄** 'caterpillar'), 19/18a (nearly all underived nouns start in a nasal or an NC sequence, e.g. **ntấm** 'fruit', **ntʃō** 'wrist') and 6 (all start either in N or in NC, e.g. **ŋgī̀** 'water', **mbí́** 'palm wine'). Note that Class 9/10 nouns never start in an NC sequence in Mundabli. For more on noun classes, see Chapter 4.

In most of the listed noun classes, the stem-initial nasal cannot be analyzed as a prefix. First, it occurs both in singular and plural forms in all genders which exhibit a singular-plural distinction, such as in **ŋkɛ́́** 'spoon(s)' (Gender 7/8, different agreement). Second, it commonly co-occurs with a noun class prefix, as in **ŋkŏŋ** 'chief' vs. **bà-ŋkŏŋ** 'chiefs' in Class 2, 19 and 18a. Third, it does not occur in all stems of the noun classes in which it is attested (i.e. Class 1, 2, 3, 10, 19 and 18a). Only in the case of Class 6 nouns can the nasal be analyzed as a noun class prefix. There is no singular-plural distinction and all Class 6 nouns start in a nasal or a nasal consonant sequence. Only the possibility to combine class 6 nouns with the class 19 diminutive prefix **fi-** could be interpreted in favour of its analysis as part of the stem, however, this could also just be a combination of two prefixes. While it is impossible at the current stage to decide for sure whether the initial nasal in Class 6 nouns is a prefix, I will assume it is not a prefix but part of the stem. Table 2.11 shows examples of monomorphemic NC(G) sequences.

[4] See Chapter 8 for more on the structure of the verbal complex.

consonants	examples	number of attested examples
mb	**mbɔ̄** ‘spark’ (CL1/2), **mbɛ̌** ‘twin’ (CL1/2)	22
mbw	**mbwíǹ** ‘flour’ (CL6)	2
mby	**mbyɨ̄ŋ** ‘crust’ (CL7/8), **mbyíl** ‘feces’ (CL7/8)	4
nd	**ndām** ‘tears’ (CL6), **ndɔ̀n** ‘branch’ (CL3/10)	5
ndy	**ndyíŋ** ‘edge’ (CL19/18a)	1
ndz	**ndzā** ‘worm, sp.’ (CL7/8), **ndzē** ‘urine’ (CL6)	8
ndzw	**ndzwɔ̌ŋ** ‘ball’ (CL19/18a)	1
ndzy		none
ɲdʒ	**ndʒàn** ‘Mundabli’ (CL1/2), **ndʒín** ‘vegetable, sp.’ (CL1/2) (in Pidgin ‘green’)	6
ɲdʒw		none
ɲdʒy		none
mf	**mfǎ** ‘inner stone in fire place’ (CL1/2), **mfǔŋ** ‘yam, sp.’ (CL7/8) (in Pidgin ‘cocoyam’ or ‘kolokosha’)	7
mfw		none
mfy		none
ŋg	**ŋgī** ‘water’ (CL6), **ŋgàŋ** ‘hill’ (CL3/10)	11
ŋgw	**ŋgwò** ‘blood relative’ (CL1/2), **ŋgwēn** ‘elephant grass’ (CL19/18)	3
ŋgy	**ŋgyâ** ‘traditional shelf’ (CL1/2)	1
ŋmgb	**ŋmgbǎŋ** ‘jaw, cheeck’ (CL7/8), **ŋmgbɛ̄** ‘upper grinding stone’ (CL1/2)	8
ŋk	**ŋkà** ‘corn beer’ (CL6), **ŋkɛ́** ‘spoon’ (CL7/8)	22
ŋkw	**ŋkwē** ‘ant, sp.’ (CL19/18a), **ŋkwēn** ‘chameleon’ (CL19/18a)	4
ŋky	**ŋkyā** ‘ant, sp.’ (CL19/18a)	1
ŋmkp	**ŋmkpɔŋ** ‘wooden stool’ (CL7/8), **ŋmkpə́ntʃìn** ‘jiggers’ (CL1/2)	4
nl	**nlétʃì** ‘cotton’ (CL1/2)	1
ns	**nsɔ̀** ‘basket, sp.’ (CL7/8), **nsūŋ** ‘friend’ (CL1)	6
nsw	**nswēn** ‘friends’ (CL2)	1
nsy		none
nt	**ntàŋ** ‘hawk’ (CL1/2), **ntā́m** ‘fruit’ (CL19/18a)	7
ntw	**ntwɛ̌** ‘throat’ (CL1/2)	1
nty		none
nts	**ntsǎ** ‘cricket, sp.’ (CL1/2), **ntsɔ̀** ‘tarantula’ (CL1/2)	13
ntsw		none
ntsy		none

consonants	examples	number of attested examples
ɲtʃ	**ntʃē** 'clay pot' (CL19/18a), **ntʃō** 'wrist' (CL19/18a)	6
ɲtʃw	**ntʃwá** 'fufu' (CL8a) (stiff porridge)	1
ɲtʃy		none
ɲʃ	**nʃù** 'palm tree, sp.' (CL3/10), **nʃő** 'bird, sp.' (CL19/18a)	4
ɲʃw	**nʃwèn** 'Lung person' (CL1/2)	1
ɲʃy	**nʃyǎ** 'rabbit' (CL1/2)	1

Table 2.11: Monomorphemic NC(G) clusters

Table 2.11 shows that some logically possible NCG sequences are attested only once and others not at all. The sequence **nl** is only attested in one noun: **nlétʃì** 'cotton'. As its bisyllabic structure suggests, this word may be derived from a historical compound, possibly made up of an infinitive verb plus a noun. Thus, it is likely that the sequence in the example is historically polymorphemic.

In infinitive verbs, all onset consonants can follow the nasal in a nasal consonant sequence. In this case, the nasal's place of articulation is assimilated to the following consonant. Thus, only nasal-consonant clusters occur which are identical in place of articulation. When the first person singular preverbal pronoun **N=** is procliticized to the first element of the verbal core, which can be the verb or a TAM marker, it is assimilated in place of articulation to the consonant that follows it so that resulting clusters are identical in place of articulation.

2.2.5 Other issues relating to consonants

This section deals with phonetic or phonological questions. Some of these issues may be superficially treated in other sections but are repeated here in order to give them a more prominent place.

2.2.5.1 The phonetic effect of the high vowels i, u, i̱ and u̱ on preceding consonants

The high vowels **i** and **u** and their pharyngealized equivalents **i̱** and **u̱**, all of which involve a remarkable degree of friction (see §2.3.1) affect the phonetic realization of consonants which precede them. Consultants say that a consonant which precedes one of these vowels is generally "drawn out" or pronounced "stronger" than otherwise. This is a phonetic side-effect of the

extreme degree of closure of the high vowels rather than a phonological process. In fact, the realization of the preceding consonant is a cue to vowel quality about as prominent as the vowel itself. While nearly all consonants are affected, the high and close vowels have different effects on different consonants. Plosives, for example, which precede one of these vowels usually have a fricative release whose place of articulation does not have to coincide with that of the plosive. The alveolar plosive **t**, for example, may be realized with strong aspiration or it may be slightly affricated, as in **tĭ** [tˢĭ] ∼ [tʰĭ] 'father', when it precedes the high front vowel **i**. Meanwhile, the velar plosive **k** may be realized with aspiration or with a palatal release in this context, as e.g. in **kĭ** [kʰĭ] ∼ [kᶜĭ] 'his' (CL7). Plosives which precede one of the high back vowels **u** and **u̯** have a bilabial release, e.g. **kŭ** [kᵠŭ] ∼ [kᵠβ̆] 'belly', **kŭ̯** [kᵠŭ̯] ∼ [kβ̆] 'fog' and **bú** [bβú] ∼ [bβ́] 'give birth'. The fricative release fades into the vowel which involves friction at least at the beginning and often throughout the vowel. My consultants say that consonants other than plosives, such as fricatives or nasals, "are usually drawn out" before **i**, **u**, **i̯** and **u̯**, i.e., their closure phase is longer before these vowels than before other, more open vowels.

2.2.5.2 Prepausal devoicing of coda consonants

The sonorants **m**, **n**, **ŋ** and **l** are often devoiced towards the end when they are followed by a pause. Although no work exists which focuses specifically on this topic, utterance-final devoicing has been reported for other languages in the wider area (e.g. devoicing of voiced stops and of the vowels **i** and **u** in Eton, see (van de Velde 2008: 23,30); and devoicing of final **b** in Limbum, see (Fransen 1995: 52)).

2.2.5.3 Preglottalized nasals

Syllables of the structure **Cam**[5] or **Can** are often pronounced with glottalization towards the end of the vowel. A few cases are also attested in which **Cọm** syllables are glottalized. The realization ranges from [Cam], [Can] and [Cọm] without glottalization, via [Caʔm̰], [Caʔn̰] and [Cọʔm̰], with a glottal closure preceding the nasal to [Caʔam̰] and [Caʔan̰] with an echo-vowel separating the glottal stop from the final nasal. Devoicing of final sonorants, which is common before a pause (see §2.2.5.2), is even stronger when it co-occurs with glottalization.[6] It is not quite clear whether glottalization is associated with the nasal or the preceding vowel. The reason for the current analysis as

[4] In contrast to this, in other languages (e.g. Limbum (Fransen 1995) and Mambila (Connell 2007)) a similar process has been described which is restricted to the high central vowel **ɨ**.

[5] The letter **C** may represent any of the attested onset consonants.

[6] Breathy or "aspirated" nasals have been reported for Bantu and Khoisan languages (Ladefoged and Maddieson 1996: 106ff.).

part of the nasal is that it only occurs in syllables which end in the nasals **m** and **n**.

Although speakers are conscious of the phenomenon, I could not find any minimal pairs which are distinguished only by the presence vs. absence of glottalization. Therefore, I assume that glottalization is not phonemic. Furthermore, glottalization has been observed both on words with a mid tone, as e.g. **wān** [wāʔn] 'child', and words with a superhigh tone, such as **kấm** [kấʔm] 'squeeze', which renders the possibility that glottalization could be an effect of the tonal pattern unlikely. The fact that glottalization occurs in words whose structure otherwise resembles their Proto-Grassfields cognates which lack glottalization, such as e.g. **wān** 'child' (Proto-Grassfields: *-án Hyman (2007)) and **kấm** 'squeeze' (Proto-Grassfields: *kám Hyman (2007)), suggests that the glottalized quality is not a phonological trace of a deleted consonant but rather a recent phonetic effect. This is further supported by the absence of glottalization in Mufu cognates.

2.3 Vowels

The Mundabli vowel inventory consists of thirteen plain and four pharyngealized[7] vowels, i.e. seventeen vowels in total. These are shown below, in two separate charts for plain (Figure 2.1) and pharyngealized vowels (Figure 2.2). The location of the vowels in the vowel charts represents their phonological role rather than their exact phonetic pronunciation. Vowel length is not contrastive.

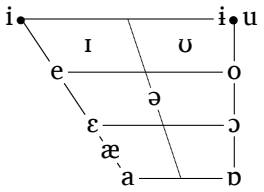

Figure 2.1: Inventory of plain vowel phonemes

A comparison of the two vowel charts in Figure 2.1 and Figure 2.2 reveals that only the high vowels **i**, **ɨ** and **u** and the mid vowel **o** have pharyngealized equivalents. Contrasts between the vowels are illustrated by the minimal pairs in §2.3.2.

[7] Pharyngealized vowels are transcribed with the diacritic commonly used to transcribe breathy vowels (e.g. according to IPA conventions), namely two horizontally arranged dots below the vowel symbol as in ṳ.

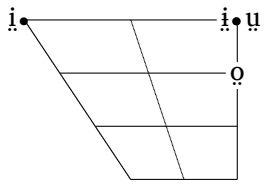

Figure 2.2: Inventory of pharyngealized vowel phonemes

2.3.1 Vowel phonemes and allophonic variation

2.3.1.1 Plain vowels

The vowel i The high unrounded front vowel **i** has a pronunciation that comes closest to IPA [i], but the tongue is raised higher than in IPA [i] and in most cases, the oral constriction is so small that the vowel is realized with friction, which can also affect preceding consonants. Examples of words containing the vowel **i** are **dʒǐ** 'dog', **tǐ** '(his/their) father' and **ʃī** 'fowl, chicken'. The friction usually starts off as affrication of the consonant preceding the vowel and fades into a more or less fricative vowel. In fact, the affrication or spirantization of the preceding consonant is often a more prominent clue for the vowel **i** than its actual vowel quality.

The behavior of verb stems containing the vowels **i** and **u** with regard to perfective vs. imperfective vowel alternations, as opposed to that of verb stems containing **ɪ** and **ʊ**, supports the hypothesis that the friction should indeed be analyzed as a feature of the vowel rather than of the consonant preceding it.

. While the high vowels **i** and **u** in perfective stems are replaced by the pharyngealized vowels **i̤** and **ṳ** in the imperfective when they occur in syllable-final position, the [-ATR] vowels, **ɪ** and **ʊ** do not change in the imperfective form.

The vowel ɪ The vowel **ɪ** is more centralized than the vowel **i**. It is reasonably close to IPA [ɪ]. Depending on the speaker, it has either about the same phonetic vowel height as the more tense **i** or is articulated with the tongue somewhat lower and closer to the mid vowel **e**. Its quality varies depending on the speaker. In Mundabli, the most reliable criteria for distinguishing **i** from **ɪ** is the friction which is commonly present in the tense vowel **i**, but absent in the more lax vowel [ɪ]. The phonological difference between **i** and **ɪ** is analyzed as a difference in tongue root position with **i** having the value [+ATR] and **ɪ** the value [-ATR]. Words containing the vowel **ɪ** include **tǐ** 'my/our father', **mĩ** 'sprinkle' (of water) and **ʃĩ́** 'storm'.

The vowel ɨ The vowel **ɨ** is a high central unrounded vowel. Although it is more centralized than the back vowel **u**,[8] it is perceptually closer to the latter than to the front vowel **i** and probably corresponds phonetically to IPA [ɯ] rather than the more central IPA [ɨ]. The reason to choose the symbol **ɨ** rather than **ɯ** is discussed in §1.2.4. The vowel **ɨ** is analyzed as a [+ATR] vowel, in analogy with the other [+ATR] vowels, which also alternate with pharyngealized vowels in the imperfective. Examples of words containing the vowel **ɨ** are **gɨ́** 'put', **kpɨ́** 'die', **ndzɨ̀** 'sheep' and **dɨ́** 'be'.

The vowel u The vowel **u** is adequately represented by IPA [u] although, just like with the front high vowel **i**, the tongue is raised higher than in IPA [u] and the vowel is usually realized with friction which can cause affrication of a preceding consonant (just like with the front vowel **i**). It is sometimes difficult to hear the difference between [+ATR] **u** and [-ATR] **ʊ**. The main clue is the friction present in [+ATR] **u** but absent in [-ATR] **ʊ** rather than vowel height or quality. Words containing the [+ATR] high rounded back vowel are **kū** 'ratmole', **mù** 'take' and **tʃú** 'come'.

The vowel ʊ The high rounded back vowel **ʊ** corresponds to IPA [ʊ]. As mentioned in the previous section, it is sometimes difficult to distinguish from the [+ATR] vowel **u** while in other cases it resembles the mid vowel [+ATR] vowel **o**. Examples of words containing this vowel are **mʊ́** 'corner', **kʊ̄** 'bone' and **tʃʊ̄** 'iron'.

The vowel e The mid unrounded front vowel **e** can be adequately transcribed as IPA [e]. It is pronounced with a somewhat more raised tongue than IPA [e] and is perceptually close to the [-ATR] high front vowel **ɪ**. Examples of words containing **e** are **ŋkḗ** 'spoon', **tsè** 'pots' and **té** 'discuss'.

The vowel ɛ The mid unrounded front vowel **ɛ** is articulated lower than **e**, essentially like IPA [ɛ]. Examples of words containing **ɛ** are **kɛ̄** 'devil', **tsɛ́** 'foundation' and **tɛ́** 'collect honey'.

The vowel ə The mid unrounded central vowel **ə** is perceptually close to the low central vowel **a**. Nevertheless, it is more centralized and can be adequately transcribed as IPA [ə]. It is often difficult to distinguish from the low vowel **a** and sometimes also from **ɔ** when it occurs in an unstressed position, i.e. the preverbal subject pronoun **bə́** or determiners like **wə̄**, **kə́**, and so on. The following minimal pairs show that the distinction is indeed phonemic: **là** 'announce' vs. **lə̀** 'do' made' and **lə̀** 'go to the bush'. Examples of words containing **ə** are **gbə̀** 'body', **tsə̌** 'baboon' and **fə̋** 'give'.

[8] Although the back vowels are all rounded, I do not see any advantage in calling them rounded rather than back vowels. The choice makes no difference for the current analysis.

The vowel æ The unrounded near-open front vowel **æ** sounds somewhat like the Standard British English vowel **æ** as in [bæd] 'bad', but towards the end the vowel is pronounced with friction. It is adequately represented by the IPA symbol [æ]. It is very rare. One example is **kǽ** 'back of head'. The near minimal pair **kɛ́** 'leg' vs. **kǽ** 'back of head' shows that **ɛ** and **æ** are distinctive.

The vowel a The unrounded open front vowel **a** is articulated to the front of the oral cavity. It can adequately be characterized as IPA [a]. In open syllables, the vowel **a** is commonly pronounced with some aspiration towards the end.

In closed syllables, the vowel **a** is pronounced longer than other vowels. There may be a length contrast in closed syllables which contain the vowel **a** and end in **m** or **n**, but the data suggest that the contrast is in vowel quality, i.e. specifically between the vowels **a** and **ə** and that the difference in duration is merely a phonetic effect. Examples for this contrast are **dzàm** 'grave' vs. **dzə̄m** 'back' and **ndàn** 'branches' vs. **n-də̀-n** 'see' (INF). Words which contain the vowel **a** are **bá** 'sheath', **tsà** 'mud' and **là** 'announce'.

The vowel o The vowel **o** is pronounced relatively close and can at times be hard to distinguish from the [-ATR] high back rounded vowel **ʊ**. The vowel corresponds to IPA [o] and is analyzed here as a [+ATR] mid back rounded vowel. A minimal pair involving the vowels **o** and **ʊ** is **bố** 'gall', 'bile' vs. **bʊ́** 'ask'. More examples of words with **o** include **fố** 'hat', **cap**, **wố** 'traditional chalk' and **kó** 'cough' (v.).

The vowel ɔ The vowel **ɔ** is lower and more centralized than its [+ATR] equivalent **o**. It is also produced with less tension. It corresponds to IPA [ɔ]. The mid back vowels **ɔ** and **o** are usually easy to distinguish. It is sometimes difficult to distinguish between **ɔ** and **ə** on the one hand and between **ɔ** and the low rounded back vowel **ɒ**. The former is usually the case when the vowel occurs in less prominent syllables, as e.g. in the determiner (see also the paragraph on the vowel **ə**), especially in fast speech. In this case, **ɔ** can easily be mistaken for **ə**. Examples of words containing **ɔ** are **bɔ̀** 'bag', **Kɔ̄** 'Koshin' (a neighboring village) and **tsɔ́** 'witchcraft'. Also the distal demonstrative/determiner consists of the root **ɔ** which takes a prefix that agrees in noun class with the noun it modifies, as in **kɔ́** 'that' (CL7) or **wɔ̄** 'that' (CL2).

The vowel ɒ The vowel **ɒ** is a rounded back vowel and more open than **ɔ**. It is thus best represented by IPA [ɒ]. In my data, it only occurs in eight CV-shaped nouns. Some speakers pronounce it very similar to the mid vowel **ɔ** or the pharyngealized vowel **o̰**. Minimal pairs involving these vowels are **dzɔ́** 'mouths' vs. **dzɒ́** 'dew' and **bɔ̀** 'wing' vs. **bó̰** 'shoulder' (see also Table 2.12). A similar vowel has been reported for Aghem (Hyman 1979: 5-6)). Examples of words containing **ɒ** are **dzɒ́** 'dew', **kɒ́** 'forest' and **kpɒ́** 'money'.

One informant who has spent half of his life outside the village does not seem to distinguish between the low back rounded vowel **ɒ** and the pharyngealized vowel **o̰**. He instead pronounces both as **o̰**, e.g., the word **dzɒ̋** 'dew' is pronounced as **dző̰** by this speaker. For a few words, speakers also reported that there was variation between a pronunciation with **ɔ** and with **ɒ**. In the speech of some informants, the vowel **ɒ** has slightly diphthongal qualities. It may in fact be a diphthong or historically derived from one. Note that one speaker pronounced words containing **ɒ** with uvular friction after the vowel resulting in [ɒɣ], where others pronounce **ɒ**. This is interesting, especially as the neighboring variety Mufu usually has final (velar or glottal) stops where older Mundabli speakers use **ɒ**.

2.3.1.2 Pharyngealized vowels

The vowel ḭ The pharyngealized high unrounded front vowel **ḭ** comes close to what would be written [iˤ], following IPA conventions. While it is somewhat more centralized than **i**, sounding more like the [-ATR] vowel **ɪ** with an additional constriction in the throat (or more specifically in the pharynx area), its alternation with the [+ATR] high vowel **i** suggests that it is better represented by **ḭ** rather than **ɪ̰**. See §8.1.3 for details. At times, the vowel **ḭ** has a diphthongal quality with the place of articulation moving downward and backward, rendering [i͡əˤ].

The vowel **ḭ** is attested in two noun roots and three verb roots. Examples are **yḭ̌** 'ant, sp.', **tʃḭ̂** 'stir Akangwa soup' and **dzḭ́** 'travel'. It further occurs in the imperfective form of verbs which contain the vowel **i** in the perfective form. Some minimal pairs are **yí̋** (PFV) vs. **yḭ́** (IPFV) 'eat', **mî** (PFV) vs. **mḭ̄** (IPFV) 'swallow' and **ʃî** (PFV) vs. **ʃḭ̄** (IPFV) 'descend'.

The vowel ɨ̰ The pharyngealized high unrounded central vowel **ɨ̰** could be transcribed as IPA [ɨˤ]. It sounds like the mid vowel **ɨ** with a constriction in the pharynx area, only a bit more fronted. Note that the mid vowel **ɨ** has no [-ATR] equivalent.

The pharyngealized central vowel **ɨ̰** is neither found in noun stems nor in perfective verb stems. It is only attested in the imperfective form of CV-shape verbs whose perfective form contains the vowel **ɨ**. Examples are **gɨ́̋** (PFV) vs. **gɨ̰́** (IPFV) 'put, place' and **kpɨ́̋** (PFV) vs. **kpɨ̰́** (IPFV) 'die'.

The vowel ṵ The pharyngealized high rounded back vowel **ṵ** which could possibly be transcribed as [uˤ], following IPA conventions is more centralized, i.e. more fronted and lower, than its unmodified equivalent **u**. Additionally, there is a constriction in the back of the throat. It sounds somewhat like the IPA vowel **ʏ** with a constriction in the throat.

The vowel **ṵ** is found in seven nouns and six underived verb stems. Examples of **ṵ** in underived noun and verb stems are **dṵ̄** 'hole', **tsṵ́** 'banana' and **lṵ** 'bark' (v.). The vowel **ṵ** further occurs in the imperfective form of CV-shape

verbs which contain the [+ATR] vowel **u** in their perfective form. Examples are **tʃű** (PFV) vs. **tʃų́** (IPFV) 'come' and **gbù** (PFV) vs. **gbų̀** (IPFV) 'fall'.

The vowel ọ The pharyngealized mid rounded back vowel **ọ** could also be transcribed as IPA [oˤ]. It is more centralized than the [+ATR] mid back vowel **o** sounding more like IPA **œ** with a pharyngeal quality. Like in all pharyngealized vowels, there is a constriction in the pharynx area.

The vowel **ọ** is found in eight nouns and thirteen underived verb stems. Examples are **fọ̄** 'hair', **bọ́** 'shoulder' or **nọ̀** 'fight' (v.). The vowel occurs in an imperfective verb form only when it is also present in the perfective verb stem or when the vowel **o** in a CV-shape perfective verb stem is preceded by the labiovelar glide **w** (which may be phonetically realized as vowel [u]). Examples are **kwó** (PFV) vs. **kwọ́** (IPFV) 'enter' and **dwò** (PFV) vs. **dwọ̄** (IPFV) 'poison' (v.). For a detailed discussion of the perfective vs. imperfective verb stem alternation, see §8.1.3.

2.3.2 Minimal pairs

The selected (near) minimal pairs in Table 2.12 illustrate the phonemic contrast between the vowels in the inventory. Rather than comparing all vowel phonemes with each other, in this table, I only compare similar vowels. Verbs are given in the unmarked P0 tense unless otherwise specified (see §8.5.1 for more on tenses). The table contains minimal pairs for all (plain and pharyngealized) vowels.

vowels	examples	gloss	examples	gloss
i/ị	**fì**	'press'	**fị̄**	'press' (IPFV)
i/ɨ	**fì**	'press'	**fɨ́**	'pass'
i/ɪ	**kí**	'his' (CL7;3SG.POSS)	**kɪ́**	'our' (CL7-1PL.POSS)
i/e	**fì**	'press'	**fè**	'remove from fire'
ị/ɨ	**fị̄**	'press' (IPFV)	**fɨ́**	'pass'
ị/ɪ	**yį́**	'eat' (IPFV)	**yɪ́**	'eye'
ị/ị́	**fị̄**	'press' (IPFV)	**fị́**	'pass' (IPFV)
ị/ụ	**fị̄**	'press' (IPFV)	**fụ̄**	'deceive' (IPFV)
ɨ/ɪ	**kpɨ́**	'die'	**kpɪ̀**	'bend'
ɨ/u	**fɨ́**	'pass'	**fù**	'raffia bamboo'
ɨ/ʊ	**fɨ́**	'pass'	**fʊ̄**	'beans, sp.'
ị́/ɨ	**fị́**	'pass' (IPFV)	**fɨ́**	'pass'
ị́/i	**fị́**	'pass' (IPFV)	**fì**	'press'
ị́/ụ	**fị́**	'pass' (IPFV)	**fụ̄**	'deceive' (IPFV)
ɪ/e	**sɪ̀**	'dress'	**sè**	'laugh'
ɪ/ə	**kpɪ̀**	'shifter', 'winnow'	**kpə**	'burn'
e/ə	**kpè**	'pot'	**kpə**	'wife'
e/ɛ	**sè**	'laugh'	**sɛ̀**	'weed' (v.)

vowels	examples	gloss	examples	gloss
e/æ	**kḗ**	'fetch firewood'	**ká́**	'occipital protruberance'
ɛ/æ	**kɛ́**	'leg'	**ká́**	'occipital protruberance'
æ/a	**ká́**	'occipital protruberance'	**ká**	'fry'
u/ụ	**fù**	'raffia stem'	**fụ̀**	'deceive'
u/ʊ	**kù**	'clap'	**kʊ̀**	'cry'
u/o	**tú**	'scoop'	**tó**	'be smart'
ụ/ɨ	**fụ̀**	'deceive'	**fɨ́**	'pass'
ụ/ʊ	**fụ̀**	'deceive'	**fʊ̄**	'beans, sp.'
ʊ/o	**bʊ́**	'ask'	**bó**	'gall', 'bile'
o/ɔ	**tó**	'be smart'	**tɔ́**	'sting'
ọ/ɛ	**bọ́**	'shoulder'	**bɛ́**	'Abar' (a neighboring village)
ọ/ə	**kpọ̀**	'punch'	**kpə̀**	'burn'
ọ/o	**fọ̀**	'hair'	**fò**	'raffia stems'
ọ/ɔ	**fọ̀**	'hair'	**fɔ̄**	'head'
ọ/ɒ	**bọ́**	'shoulder'	**bɒ̀**	'wing'
ɔ/ɒ	**dzɔ́**	'mouths'	**dzɒ́**	'dew'
ə/a	**lə̀**	'do'	**là**	'announce'
ə/ɔ	**dzə̄m**	'back'	**dzɔ̄m**	'war'
a/ɒ	**ká**	'fry'	**kɒ́**	'fold'

Table 2.12: Minimal pairs for vowels

2.3.3 Issues in vowel interpretation

In this section, a few unusual vowel characteristics are described in more detail.

2.3.3.1 Individual speaker variation in the phonetic proximity between high and mid vowels

One of the most difficult tasks regarding the perception and description of Mundabli vowels is to distinguish the [-ATR] high front and back vowels **ɪ** and **ʊ** from the [+ATR] high vowels **i** and **u** on the one hand, and from the [+ATR] mid vowels **e** and **o**, on the other. This may sound strange because it implies that the [-ATR] high vowels resemble the [+ATR] high vowels and the [+ATR] mid vowels at the same time.

However, this confusion can be explained by the unusual degree of individual speaker variation in the pronunciation of these vowels. While some speakers pronounce the [-ATR] high vowels **ɪ** and **ʊ** closer to the [+ATR] high

vowels **i** and **u**, others pronounce these closer to the [+ATR] mid vowels **e** and **o**. This was suggested by a comparison of vowel plots for several speakers and is reflected by nearly identical F1 and F2 values for the respective pairs (i.e., for **i** and **ɪ** and **u** and **ʊ**, respectively, for some speakers, and **ɪ** and **e** and **ʊ** and **o** for others).

Figure 2.3[9] contains a vowel plot of all plain vowels (to the exclusion of pharyngealized vowels) of one speaker. The vowels **ɨ** and **ɒ** are represented as **ɯ** and **ɔr** in the plot.

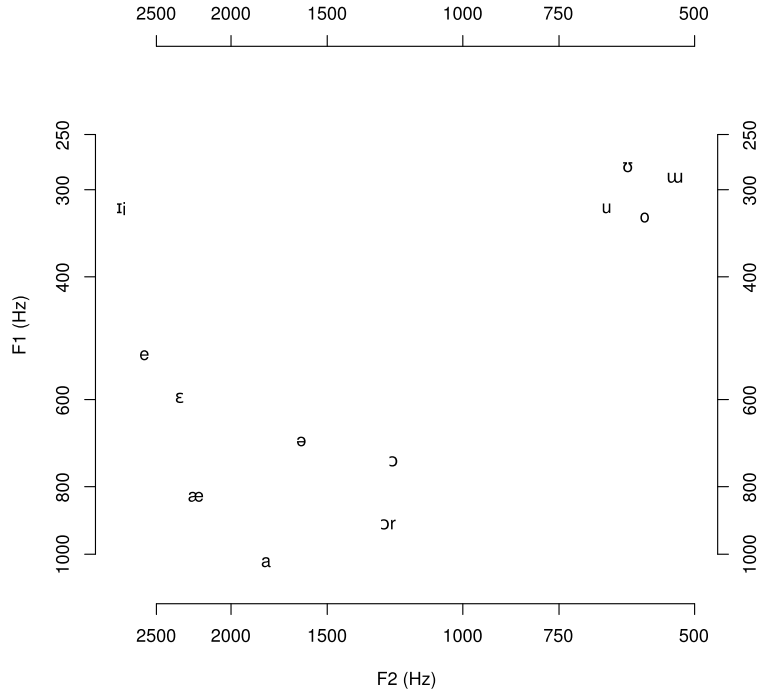

Figure 2.3: Vowel plot (speaker: Kemba Jacqueline Ntie)

The plot in image 2.3 is based on single utterances of open syllable words containing the relevant vowels, uttered by a female speaker (Kemba Jacqueline Ntie) in 2012. Clear and representative tokens were selected, although the values are not statistically relevant because they were taken from a single recording.

The plot confirms some of my intuitive judgements. At least in the chosen utterances, the high front vowels **i** and **ɪ** cannot be distinguished on the basis of their F1 and F2 values alone. I had a hard time learning to distinguish

[9]Thanks to Jesse Lovegren for creating this vowel plot.

between the two, and the distinction seems to be based on the presence vs. absence of friction more than anything else. The difficulty of distinguishing between the back vowels **u** and **ʊ** on the one hand, and **ʊ** and **o** on the other, are also reflected in their close proximity in the plot. The other vowels, which can be more easily distinguished from one another, are also further apart in the vowel plot.

2.3.3.2 Pharyngealized vowels: characteristics, distribution and origin

The existence of pharyngealized vowels has been reported for languages of several language families including Tungusic, Caucasian, Northern and Southern Khoisan (Ladefoged and Maddieson 1996: 306), but also for several Cameroonian languages including Mambay (Adamawa, Northern Bantoid, Niger-Congo, Anonby 2008) and Kwasio (Bantu (A80), Southern Bantoid, Niger-Congo, Duke and Martin 2012). The co-existence of an [ATR]-distinction on the one hand and pharyngealized vowels on the other, as attested for Mundabli, is unusual and might contribute new data to the theoretical discussion of pharyngealized vowels.

According to Ladefoged and Maddieson (1996: 306), pharyngealization involves active retraction of the tongue root. As Ladefoged and Maddieson (1996: 313) point out, [ATR], pharyngealized and strident vowels are characterized by some degree of pharyngeal narrowing and larynx raising and languages seldom use more than one of them. Mundabli seems to be one of the few exceptions to this tendency, having both a distinction in [ATR] and a distinction between plain vs. pharyngealized vowels. I am not aware of any other language which makes both of these distinctions.[10]

Pharyngealized vowels are predominantly found in the imperfective form of verbs, but also in a few underived verb and noun stems. The perfective vs. imperfective verb stem alternation comprises a vowel alternation in which a plain [+ATR] high vowel (**i**, **ɨ** or **u**) in the perfective verb form alternates with a pharyngealized vowel (**i̪**, **ɨ̪** or **u̪**, respectively) in the imperfective form if it occurs in an open syllable, as in **yí** (PFV) vs. **yí̪** (IPFV) 'eat', **tʃú** (PFV) vs. **tʃú̪** (IPFV) 'come' and **fĩ́** (PFV) vs. **fɨ̪́** (IPFV). Notably, [-ATR] vowels do not take part in the alternation. While the alternation of [+ATR] high vowels with pharyngealized vowels is systematic, the picture becomes more complicated for non-high vowels due to the existence of the pharyngealized mid vowel **o̪**, which does not correlate with a plain vowel as clearly as the other pharyngealized vowels (see §3.3.5 for details).

There are two important restrictions on the occurrence of pharyngealized vowels: they are only found in lexical items and they are restricted to open syllables. Pharyngealized vowels are most commonly found in derived imper-

[10]Ladefoged and Maddieson (1996: 313) propose !Xóõ, a Southern Khoisan language which distinguishes plain, pharyngealized and strident vowels but lacks an [ATR] distinction, as a counterexample to the rule. They admit that "the most suitable phonological parameters to use in describing these vowels were not clear to [them]" at the time of writing.

fective verb forms. They are only sporadically attested in nouns and underived verb stems such as **bǫ̆** 'gorilla', **dzi̯** 'travel', **yĭ̯** 'ant (sp.)' and **dū̯** 'hole'.

While pharyngealized vowels have been attested in other Cameroonian languages, Mundabli is the only language with pharyngealized vowels in the immediate area (i.e., Lower Fungom and beyond). It is therefore not likely that the pharyngealized vowels have entered the language through contact. Instead, at least two factors point to their relatively recent emergence under the influence of a velar or glottal coda consonant and subsequent loss of that coda consonant. These factors are the presence of velar or glottal coda consonants in cognates in the related varieties Mufu and Buu (see §1.1.4 for more on these varieties and their relation to Mundabli; note that Mundabli allows obstruent codas only in ideophones) and the restriction of pharyngealized vowels to CV syllables.

Pharyngealized vowels are attested in two contexts: they occur in a few noun and verb stems of CV-shape and the imperfective form of a verb is derived from the perfective form by pharyngealizing the stem vowel under certain circumstances (stem vowels **i**, **i̯**, **u** and sometimes **o**, and a CV-shaped verb stem, see §8.1.3 for details). In both contexts, the pharyngealized vowel in Mundabli correlates with a closed syllable ending in a velar or glottal stop in Mufu.[11]

When a Mundabli noun or verb stem contains a pharyngealized vowel, its Mufu cognate generally ends in a velar or glottal stop. Thus, for example, the word for 'banana' is **tsʉ́** in Mundabli but **cuk**[12] in Mufu.

In the case of imperfective verb forms, there is also a correlation. While in Mundabli the imperfective verb form is derived from the perfective form by pharyngealizing the stem vowel (under the given circumstances), the imperfective verb form in Mufu is marked by the suffix **–k**.[13]

While all these facts seem to suggest that Mundabli pharyngealized vowels in their current form have developed due to the influence of syllable-final **k** or **q** and subsequent loss of that final consonant, this scenario is hypothetical and more research (on both varieties as well as on Buu) is needed to determine what exactly was the historical scenario which led to the emergence of pharyngealized vowels in Mundabli.

Apart from my own preliminary investigations, practically no research has been done on Mufu. Issues which should be investigated in the future are e.g., whether the imperfective suffix in Mufu is also used with closed syllable verb stems, and whether it can co-occur with all stem vowels or whether its co-occurrence is restricted to a few stem vowels, like pharyngealization in Mundabli. An imperfective suffix **-kə** is also attested in Buu.[14] The imperfec-

[11] Note that Mufu, unlike Mundabli, allows non-sonorant syllable codas.

[12] The symbol **c** represents a voiceless palatal stop. Tone is not marked in Mufu examples. Coda stops in Mufu are usually unreleased.

[13] The Mufu imperfective suffix is probably a reflex of the common Bantu marker **–a(ŋ)g-a** (IPFV) (Nurse and Philippson 2006: pp.190-192)

[14] This information is based on my own fieldwork and on an MA thesis on Buu phonology (Ngako

tive suffix **-kə** in Buu co-occurs with both open and closed syllables. I am not aware whether it co-occurs with all stem vowels or not.

2.4 Phonotactics

Mundabli has twenty-two consonant phonemes and seventeen vowel phonemes organized in syllables. Most words consist of a single syllable. This section contains a description of the syllable structures attested in stems and non-lexical items (including affixes) (§2.4.1), it deals with distributional restrictions on consonants (§2.4.2) and with possible CV sequences (§2.4.4), and it also contains sections on the phonotactics of ideophones (§2.4.5) and on loanword adaptation (§2.4.6).

2.4.1 Syllable structure

Mundabli has four syllable types: (N)C(G)V, (N)C(G)VC, V and N. The only coda consonants attested are the nasals **m**, **n** and **ŋ** and the lateral aproximant **l**. In order to describe the syllable adequately one must distinguish between lexical stem syllables and non-stem syllables (syllabic prefixes and suffixes, clitics and function words).

Most lexical stems are monosyllabic, so that in most cases the stem syllable is identical with the whole stem. The following syllable structures are attested in stem syllables: (N)C(G)V and (N)C(G)VC. Stem syllables always have an onset. This onset may consist of a consonant or one of the attested consonant clusters, i.e. a nasal consonant sequence, a consonant glide sequence or a combination of the two. Onset consonants in stem syllables are not restricted, i.e. any consonant or any attested consonant cluster can form the onset of a stem syllable. However, homorganic NC sequences and CG sequences are prevalent stem-initially. Unlike the range of onset consonants, the range of attested coda consonants is very restricted. Coda nasals are far more common than the liquid **l** which is only found in a few stems, e.g. **bwól** ‘dust’, **fyǐl** ‘whirlwind’, **mà̄l** ‘slide’ (v.) and **bű̄l** ‘castrate’. Younger speakers (up to the age of around forty) drop the final **l** in certain CVl words. In this case, the vowel in the resulting open syllable is usually more closed than in the original syllable with a coda **l**. Examples are **bwɛ̀l**∼**bwɛ̀** ‘calabash used as oil container’ and **tà̄l**∼**tɛ̀** ‘pull’. All vowels are attested in stem syllables.

Non-stem syllables, i.e. syllables in prefixes, suffixes, clitics and function words are subject to other restrictions than stem syllables. In non-stem syllables, only the syllable patterns CV, V and N are attested. Consonant clusters are not attested at all. Unlike stem syllables, non-stem syllables may lack an onset, such as e.g. the preverbal negative marker **ā** or the locative marker **ǐ́**. A non-lexical syllable may also consist of a nasal only, as in the case of the

Yonga 2013).

preverbal first person singular pronoun clitic which consists of a nasal, homorganic with the first element of the verbal core (i.e. either the verb or a TAM marker, see Chapter 8 for more on the verbal core) and which can be syllabic and bear a superhigh tone under certain circumstances, as in the following example: **ŋ́=kà kʊ̀** 'I cried.' (P3); see also §6.1.

The syllable-structure of syllables in ideophones, interjections and unintegrated loans may diverge from those described above. For more on ideophones, loanwords and interjections, see §2.4.5, §2.4.6 and §10.7, respectively.

2.4.2 Distributional restrictions on consonants

This section deals with the distributional restrictions on the two most restricted consonants, the velar nasal **ŋ** (§2.4.2.1) and the palatal nasal **ɲ** (§2.4.2.2).

2.4.2.1 Distributional restrictions on the velar nasal ŋ

The velar nasal **ŋ** is frequently attested as syllable rhyme. It is also commonly found in stem-initial NC sequences, preceding a homorganic velar stop (as in e.g., **ŋgə̄** 'quarter head' and **ŋkáŋ** 'salt'). However, it rarely constitutes an onset on its own. Syllable-initial **ŋ** without a subsequent velar stop is only found in three words. Only in one of these, **ŋà** 'boast', **ŋ** alone constitutes the onset. In the other two cases, **ŋ** is followed by a labial glide: **ŋwà** 'write' and **ŋwǎŋ** 'xylophone'. In functional items, syllable-initial **ŋ** is not attested at all.

2.4.2.2 Distributional restrictions on the palatal nasal ɲ

The palatal nasal **ɲ** is restricted to stem-initial position; it is thus neither attested in the onset of non-stem syllables nor in coda position. It can either constitute an onset on its own, as in **ɲū** 'field' and **ɲām** 'fufu', or it can be part of a syllable-initial consonant cluster, in which case it can be followed by a labial glide within a consonant glide sequence (e.g., **ɲwé** 'fields' and **ɲwáǹ** 'beg'), or a homorganic obstruent (e.g., **ɲdʒà̀n** 'Mundabli' and **ɲtʃé** 'armpit').

2.4.3 Restrictions on VC sequences

As pointed out in §2.4.1, only the nasals **m**, **n** and **ŋ** and the lateral approximant **l** are attested as coda consonants. Table 2.13 shows which vowels cooccur with which of the attested coda consonants and where there are gaps. Vowels are given in the first row, coda consonants are given in the first column. Sequences marked by a checkmark are attested, those marked with a hyphen are not.

Except for the vowel **o̰**, pharyngealized vowels are restricted to open syllables. The vowel **o̰** is attested before coda **m** in a handful of words, including

	i	i̤	ɨ	ɨ̤	u	ṳ	ɪ	ʊ	e	o	o̤	ɛ	ɔ	æ	ə	a	ɒ
m	-	-	✓	-	-	-	✓	✓	-	✓	✓	✓	✓	-	✓	✓	✓
n	✓	-	✓	-	-	-	✓	✓	✓	-	-	✓	✓	-	✓	✓	-
ŋ	-	-	✓	-	-	-	✓	✓	-	-	-	✓	✓	-	✓	✓	-
l	-	-	-	-	-	-	-	✓	-	-	-	✓	-	-	✓	✓	-

Table 2.13: Possible combinations of vowels and coda consonants

dọ̄m ‘cure’, **nǫ̋m** ‘bite’ and **wǫ̋m** ‘shout’. While [-ATR] vowels such as **ɪ**, **ʊ**, **ɛ** and **ɔ** are commonly attested in closed syllables and can be followed by all coda consonants, the [+ATR] vowels **i**, **u**, **e** and **o** are only rarely attested in closed syllables. Examples are **nswēn** ‘friend’ and **twòm** ‘stomach’.

As shown above, not all combinations of vowels and coda consonants are attested. In fact, the set of vowels that can be combined with a particular coda consonant varies strongly. For example the range of vowels which are attested before coda **l** is very restricted (see below). In its degree of co-occurrence restrictions, **l** is followed by the velar nasal **ŋ** which can only be preceded by the following vowels: **ɨ**, **ɪ**, **ʊ**, **ɛ**, **ɔ**, **ə** and **a**. Finally, **m** and **n** show the least restrictions. Coda **n** can be preceded by **ɨ**, **ɪ**, **ʊ**, **ɛ**, **ɔ**, **ə** and **a**, like **ŋ** and in addition by **e**. Coda **m** can be preceded by **ɨ**, **ɪ**, **ʊ**, **ɛ**, **ɔ**, **ə** and **a**, like **ŋ** and **n** and additionally by **o**, **ɒ** and **o̤**. Notably, the mid high vowel **ɨ**, which seems to have the status of a [+ATR] vowel, is attested before all coda nasals, unlike the other [+ATR] high vowels **i** and **u**, whose occurrence in closed syllables is very restricted.

kwâl∼kwê	‘rat, sp.’
nwǎl	‘hippopotamus’
bwúl	‘dust’
wúl	‘beige’
kwə̌l	‘crocodile’
kwə̀l	‘sacred grove’
bwɛ̄l∼bwɛ̄	‘calabash used as oil container’
mbyíl	‘feces’
fyǐl	‘whirlwind’
fǐl	‘wisdom’
màl	‘slide’
sál∼sé	‘be hot’, ‘heat (up)’
tàl∼tɛ̀	‘pull’
yíl	‘be black/blue/green’
yì̀l	‘tickle’
búl	‘castrate’

Table 2.14: CVl words

As mentioned above, the range of vowels which can occur in CVl-syllables is especially restricted. However, the small number of vowels attested in CVl-syllables may be due to the small number of words (or syllables) ending in a lateral approximant. Only the vowels **a**, **ə**, **ɛ** and **ʊ** are attested before coda **l**. Table 2.14 contains all words ending in **l**. The loanword **skûl** 'school' is not listed in the table because it is an unadapted loanword.[15]

2.4.4 Restrictions on CV sequences

While the range of segments which can form a syllable coda is very restricted (see §2.4.1), the onset of a syllable can be represented by any of the attested consonants or consonant sequences. However, not all onset consonants can co-occur with all vowels. Table 2.15 shows which consonant-vowel sequences are attested and where there are gaps. Vowels are found in the first row and the onset consonants which precede them are found in the first column. Combinations marked with a checkmark are attested, those marked with a hyphen are not attested. Table 2.15 contains only simple onsets; at least some of the gaps may be accidental.

2.4.4.1 Neutralization of alveolar and alveo-palatal sibilants and affricates before the vowels i and u

The alveolar sibilants and affricates **s**, **ts** and **dz** generally do not precede the [+ATR] high vowels **i** and **u**; see Table 2.15. Instead, the alveo-palatal sibilants and affricates (**ʃ**, **tʃ**, **dʒ**) are commonly attested before these vowels, e.g. in **ʃī** 'market', **tʃű** 'come' and **dʒǔ** 'goat'. Thus, there seems to be a strong tendency to neutralize the opposition between alveolar and alveo-palatal sibilants in the given context. In other contexts, the distinction between alveolars and alveo-palatals is contrastive and thus phonemic. Due to the general lack of segmental morphology in Mundabli, no active process of alternation between alveolar and alveo-palatal consonants can be observed. While neutralization before **i** and **u** is the rule, my data contain two words in which an alveolar affricate precedes the [+ATR] high vowel **u**, namely **tsű** 'slap' and **tsú** 'contribute'.

2.4.5 Phonotactics of ideophones

The phonological structure of ideophones differs from that of both lexical and function words in several aspects including their syllable structure, their number of syllables and the occasional prolongation of segments. Ideophones may

[15] While the word also exists in Mundabli in a phonotactically more adapted shape, **ʃùkúlù**, younger speakers prefer the less adapted form **skûl** which is closer to the Standard English pronunciation. It is unknown whether the older word was originally borrowed as **ʃùkúlù** from an earlier version of Cameroon Pidgin or whether its phonotactics were adapted when it was borrowed (whether from Pidgin or from a neighboring language). See §2.4.6 for more on loanword adaptation.

	i	ɨ	u	ɪ	ʊ	e	o	ɛ	ɔ	æ	ə	a	ɒ	i̤	ɨ̤	ṳ	o̤
b	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	-	-	✓	✓
t	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	-	-	✓	✓
d	✓	✓	-	-	✓	✓	✓	✓	✓	-	✓	✓	✓	-	✓	✓	✓
k	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	✓	-
g	✓	✓	✓	-	✓	✓	-	✓	✓	-	✓	✓	✓	-	✓	-	-
kp	-	✓	✓	✓	-	✓	-	-	✓	-	✓	✓	✓	-	✓	-	✓
gb	-	✓	✓	✓	✓	✓	-	✓	✓	-	✓	✓	-	-	-	-	-
ts	-	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	-	✓	✓	✓
dz	-	✓	-	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	-	-	-	✓
s	-	✓	-	✓	✓	✓	-	✓	✓	-	✓	✓	-	-	-	✓	-
tʃ	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	-	✓	-	✓	-
dʒ	✓	✓	✓	✓	✓	-	-	✓	✓	-	✓	✓	-	✓	-	-	-
ʃ	✓	✓	✓	✓	✓	✓	✓	-	✓	-	-	✓	-	✓	-	-	-
f	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	✓	✓
m	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	✓	✓	✓	-	✓	✓
n	✓	✓	-	✓	-	-	✓	✓	✓	-	-	✓	-	-	-	-	✓
ɲ	-	✓	✓	✓	-	-	-	✓	✓	-	✓	✓	✓	-	-	-	-
ŋ	-	-	-	-	-	-	-	-	-	-	-	✓	-	-	-	-	-
l	✓	-	✓	✓	✓	-	✓	✓	✓	-	-	✓	-	-	-	✓	-
w	-	-	✓	✓	✓	✓	✓	✓	✓	-	-	✓	-	-	-	✓	✓
y	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	-	✓	✓

Table 2.15: Restrictions on consonant-vowel sequences (only simple onsets)

also contain segments which are not part of the regular phoneme inventory. Ideophones are treated in detail in §10.5.

Unlike other words, ideophones and unadapted loanwords allow coda consonants other than **m**, **n**, **ŋ** or **l** (see also §2.4.6). Final obstruents are attested exclusively in monosyllabic ideophones, such as **kpà?** 'sound of grabbing' and **kăt** 'showing that something is completely finished or destroyed'. Coda stops generally do not have an audible release.

Furthermore, ideophones frequently involve multiple reduplication and, unlike other words in the language, are often polysyllabic. Examples of such polysyllabic ideophones in the following utterances are underlined:[16] ◇**dzīŋ yɔ̄ myă áná wɔ̌ŋwɔ̌ŋwɔ̌ŋ(...)** 'Heavy rain is falling continuously.' and ◇**ŋkā mɔ́ mùbò áná tsàtsàtsà** 'That corn beer tastes awful.'. Cases of multi-syllabicity aside from reduplications commonly occur in sound imitation, often in combination with reduplication, such as e.g., ◇**ɲáŋkáŋkèŋkèŋkèŋ** 'call of bush fowl (**ɲăŋ**)'.

In order to add emphasis and make the conversation more lively, syllable rhymes in ideophones can be prolonged. This happens primarily in monosyl-

[16] The diamond marks elicited examples.

labic ideophones. In open syllables, the vowel is extended, as e.g. in ◇**kī dʒī áná dʒűűűűűű** 'It was really cold.' or ◇**nɨŋ kɔ́ yíl áná fììììì** 'That thing is pitch-black.'. In closed syllables, a final sonorant can be drawn out, as in ◇**wē bán áná ŋàŋŋŋŋ** 'The sun is burning down.'.

Finally, ideophones may exhibit sounds which are not part of the general phoneme inventory, such as the voiceless labial plosive **p**, as in **tấp∼pấp** 'showing that something is full up to the rim', or the glottal stop **ʔ**, as in **kpàʔ** 'sound of grabbing'.

2.4.6 Loanword adaptation

Loanwords are adapted to Mundabli phonotactics to varying degrees. In some cases, different forms of the same loanword which are adapted to different degrees co-exist in the language, as in the case of the word for 'school' which has various realizations: **skul∼skulu∼ʃukulu**. In fact, there are two more, probably older words for school, namely **ŋwàtɨ** (same as 'book') and **tấkèdā** (from Hausa *takàr̃dā* 'paper').[17] The choice of a variant depends on various factors such as speakers' age and level of education. This section is divided into loans from English and Cameroon Pidgin on the one hand, and loans from other languages on the other. However, I am much more familiar with English and Pidgin than with the other source languages (except for French) and I therefore do not say much about loanwords from other languages. More research is needed to identify loans from other local languages or to exactly determine when and how loans words made it into the language.

2.4.6.1 Loans from English and Cameroon Pidgin

For most if not all loanwords with English cognates, it is hard (if not impossible) to tell whether a loanword has been borrowed from English (locally known as 'grammar') or from Cameroon Pidgin, or whether it has been adopted from a neighboring language which had already borrowed the term from one of the two and then passed it on. Thus, it is in fact unclear to what extent the difference between the loanwords and their original sources is really due to loanword adaptation in Mundabli, and to what extent changes had happened before the words entered the language. In the remainder of this section, the changes are described assuming they were due to direct adaptation of English words to Mundabli phonotactics. Adaptation strategies include elimination of consonant clusters and obstruent-final syllables and replacement of foreign segments. The loanword **kěʃîmân** 'Christmas' illustrates various strategies of loanword adaptation, see sections below.

[17] Some of the loans whose ultimate source is assumed to be Hausa also exist in Fulfulde. Translations are taken from Newman (1990). The Hausa words are written in the standard Hausa orthography: <ā> denotes a long /a/, only low tones are marked, and unmarked tones are high.

Avoidance of consonant clusters Consonant clusters other than syllable-initial nasal consonant and consonant glide sequences do not exist in Mundabli. Therefore, they are usually eliminated in loanword adaptation, e.g. by means of consonant deletion or vowel epenthesis. An example for this is the word **kɛ̌ʃìmân** 'Christmas'. The **r** in the first syllable of 'Christmas' was deleted in order to avoid an onset cluster. In the more conservative pronunciation **ʃukulu** 'school' a vowel is inserted between the two initial consonants in order to break up the initial **sk** cluster. However, many younger speakers use less adapted forms like **skulu** or **skul**. In the words **fɛn** 'fence' and **dzîŋ** 'zinc' the final consonants, **s** and **k**, respectively, are deleted to avoid clusters in the coda.

Avoidance of obstruent-final syllables Various strategies are employed to avoid closed syllables. In the example **kɛ̌ʃìmân** 'Christmas' for example, two different strategies are used. The obstruent coda of the initial syllable of the word 'Christmas' is turned into the onset of a new syllable by means of vowel epenthesis. The obstruent coda **s** of the final syllable on the other hand is simply replaced by the sonorant **n**, resulting in a well-formed CVN syllable. In the pronunciations **ʃukuru** and **skulu** for 'school', a vowel is inserted in final position, resulting in an open syllable even though native words may end in the liquid **l**.

Replacement of foreign segments The third strategy for loanword adaptation is the replacement of alien segments with native ones. An example is the word **dzîŋ** 'zinc' in which the voiced fricative **z**, which is not part of the Mundabli inventory, is replaced by the voiced affricate **dz**.

2.4.6.2 Loans from languages other than English or Cameroon Pidgin

I cannot say much about the grade of adaptation of loans from languages other than English or Cameroon Pidgin, because I do not know enough about their original forms in the source languages and, in many cases, I may not even be aware that they are loanwords. The few examples I am aware of do not violate Mundabli phonotactics. Among these are **nāsɛ̄** 'white person' (orig. *nàsāřa*, Hausa) and **nănáá** 'pineapple' (orig. *ananas*, French). While the latter two loanwords have lost a syllable in the process, it is not known whether this happened when they were integrated into Mundabli or in another language from which they were then borrowed into Mundabli.

Another example is one of the words for school, **tấkèdā** (from Hausa *takàř-dā* 'sheet of paper, letter, book'). It is unclear whether this word was borrowed directly from Hausa or whether it was borrowed from another local language which may have borrowed it from another local language (possibly several times in turn) after it was borrowed from Hausa. And even if it was directly borrowed from Hausa, it is unclear which dialect form was borrowed.