Kera

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Kera is an Eastern Chadic language spoken by about 50,000 people in southwestern Chad, south of the town of Fianga, and in major towns of Cameroon and Chad. Most Kera speakers would claim to speak a standard variety of Kera although there is some variation depending on gender and location. The differences involve the relationship between tone and voicing, the number of contrastive tones and the presence or absence of a voicing contrast. Women are more conservative than men in the use of tone in rural settings and more innovative than men in urban settings (Pearce 2009). Previous literature on Kera includes Ebert (1975, 1976, 1979) and Pearce (1999, 2006a, b, c, 2007a, 2008, 2009).

Consonants

	Labial		Alveolar		Palatal		Velar		Glottal
Plosive/Affricate	p	b	t	d	tʃ	dʒ	k	g	ʔ
Fricative	f	v	s	z					h
Implosive		ɓ		ɗ					
Nasal		m		n				ŋ	
Flap		̆v		ɾ					
Lateral approximant				l					
Approximant		w				j			

/p/	pāaɾā	'paddle'	/t/	táawá	'kidneys'	/k/	káajá	'dogs'
/b/	bàaŋà	'elephant'	/d/	dàanà	'and'	/g/	gàarà	'plant it (F)'
/tʃ/	tʃíiɾíi	'undo'	/dʒ/	dʒàaŋà	'stool'	/ʔ/	(ʔ)έɛlέɛ	'be heavy'
/f/	fártā	'skirt'	/s/	sāamā	'rope'	/h/	háamέɛ	'bend metal'
/v/	vàalέɛ	'to interest'	/z/	zɔɔrέɛ	'sew'			
/ɓ/	ɓɔɔrɔ̄	'arrows'	/ɗ/	ɗέɛwέ	'torrent'			
/m/	mɔ̄ɔmɔ́	'ancestor'	/n/	nāalā	'long grass'	/ŋ/	ŋàalέɛ	'chat'
/̆v/	̆víktíi	'harden'	/ɾ/	ɾáawέɛ	'continue'			
/w/	wáalέɛ	'joy'	/l/	láawέɛ	'sadness'	/j/	jáakέɛ	'leave'

In the consonants chart, a voicing contrast is shown for obstruents. For the majority of speakers, and particularly those influenced by contact with French, there is a voicing or VOT contrast and a two-way tonal contrast. Voicing (for stops and fricatives) cannot be combined with H tone, so this leaves three contrastive groups when voicing and tone are taken into account. Among village women, there is less contact with other languages, and the

tone/voicing relationship is different. There is no voicing contrast, but there is a three-way tonal contrast marking the same three groups of contrast as the other speech varieties. There is more discussion on this point in the section on tone and orthography, and in Pearce (2006b). The importance of this discussion in this section is that for some speech varieties, a voicing contrast is part of the grammar, whereas for others, it is not. The consonant chart here applies to the variety with the voicing contrast.

In speech varieties where there is a voicing contrast, the phonetic realization of the contrast is usually between short and long positive VOT. However, some speakers (including the two speakers in the recordings for this Illustration) vary between short positive VOT and true voicing, similarly to the way English speakers often vary in the production of the voiced-stop series. Intervocalically there may also be true voicing if the surrounding tones are L.

The affricates /dʒ/ and /tʃ/ are analyzed phonologically as palatal stops (and are in fact treated as such in the orthography), but they are realized as affricates. The glottal stop only contrasts with absence of glottal stop, and only word medially (or finally in words with final vowel deletion).

bìʔ̀ì / bìʔ 'perish'   bìi 'come'
dɔ̀ʔɛ́ɛ / dɔ̀ʔ 'burn'   dɔ̀ɔ 'grab'

Words beginning with a vowel are normally pronounced with an initial glottal stop, but this is not contrastive.

The inclusion of the labiodental flap (/ⱱ/) is somewhat controversial because the sound almost certainly entered the language from the influence of other languages, and is not used equally by all speakers (either because the vocabulary is not known or because a substitute such as /w/ is used). Kera is one of only 80 languages in the world where this sound is attested. In Kera, 95% of the 60 words containing the flap are ideophones. However, minimal pairs exist that show how it contrasts with similar sounds, and for this reason it is included in the phoneme chart.[1] Kera was one of the languages cited by Olson & Hajek (2003, 2004) in the argument for the inclusion of the labiodental flap in the International Phonetic Alphabet. Labiodental flap minimal pairs are illustrated in the following list (bold indicates the sounds in question):

ⱱíw   'see something pass quickly'
bìw   'sudden explosion of fire'   **p**íw 'pull something till it breaks'
ⱱìw   'hearing something pass by'   **w**íw 'something attached'
pə́**ⱱ**āw   'escape quickly'
pə́**w**āw   'noise in forest'

Word-medially, almost all consonants can be in coda position (with the exception of the labiodental flap), but word-finally, only sonorants can occur:

WORD-MEDIAL POSITION   WORD-FINAL POSITION
gù**f**tí   'groan'   gùdù**l**   'song'
gù**d**ɓùl   'stool'   gùukú**r** 'chicken'[2]

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[1] All of these words are relatively rare, so the labiodental flap appears only infrequently in most natural texts.

[2] The voicing of the second consonant in gùukúr depends on the speech variety. The orthography is ⟨guugur⟩, but phonologically, in speech varieties where there is a voicing contrast, the second consonant is voiceless. Phonetically, the length of VOT depends on the pitch (Pearce 2007b), and for an LH word such as this one, the pitch at the beginning of the second syllable is still quite low, so the VOT can be quite short. Further discussion of the relationship between voicing, VOT and tone is given in the 'Tone' section below.

Table 1 Changes of quality in light and heavy syllables.

	CV	CVC	CVV	Nasalized (C)V	Nasalized CVV
a	tʃɔ̄wāa 'fire'	bàj 'without'	bàaŋà 'elephant'	ɑ́jéɛ 'pour'	àdʒɑ̃̄ɑ̃já 'sand'
i	bìŋíi 'open'	gìl 'upright'	bìirìi/bìiríi 'come out of coma'		tʃĩ̄ĩwítī 'whisper'
ɛ	bègéɛ 'animal'	jɛ̀w '1st vertebrae'	bɛ̀eré 'wild boar'	āgɛ̄rhɛ̄ 'goat'	āwɛ́ɛ̃lɛ̄ 'bat'
u	bùgúu 'bag'	gùd 'behind'	bùusí 'divide'		
ɨ	gìgìr 'knee'	bɨ̀j 'placed'	bɨ̀iŋ̀ì 'tree type'	àvɨ̀j 'propaganda'	fɨ̃̄ɨj-fɨ̃́ɨj (ideo.) 'good smell'
ɔ	bɔ̀géɛ 'dig'	dɔ̀l 'hard earth'	bɔ̀ɔbɔ̀ 'nothing'	hɔ̃́j 'sufficient'	gɔ̃̀ɔ̃jà 'greed'

To avoid an obstruent in word-final position, an epenthetic vowel [i] is added:

gùɓī 'thousand'
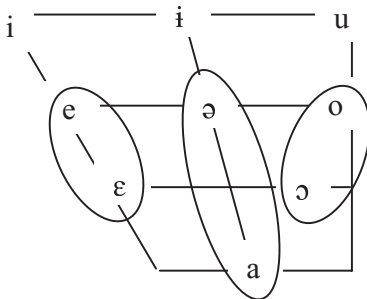
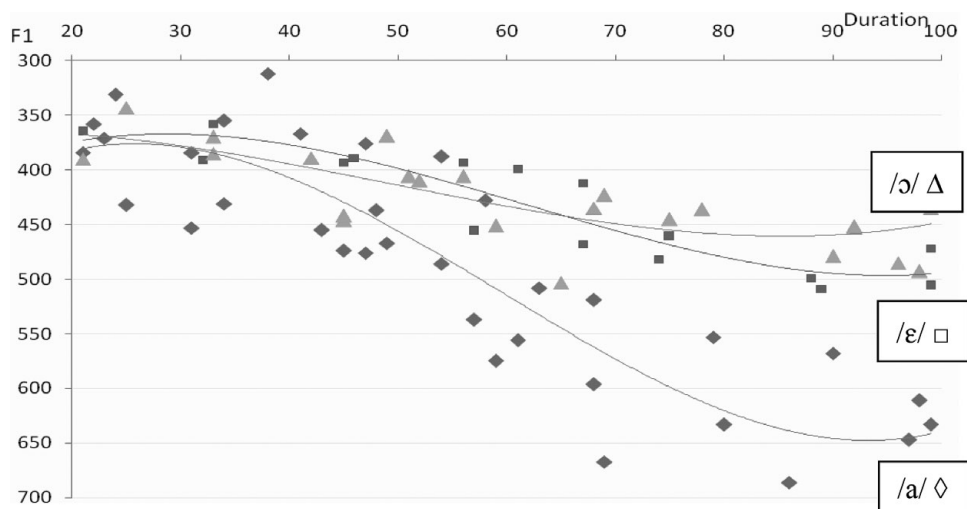## Vowels

lengthened vowels: /ii ɨɨ uu ɛɛ aa ɔɔ/[3]
nasalized vowels (short and long):
   / ɨ̃ ɛ̃ ã ɔ̃/, /ĩĩ/ is only long

The ellipsis lines indicate allophones of one phoneme. In each case, the tense (more closed) vowel can only appear in light syllables before a heavy syllable while the lax (more open) vowel appears elsewhere. The light syllable with the tense vowel is phonetically shortened. Pearce (2007a) claims that this is to heighten the contrast between the non-head and the head in an iambic foot. This means that the vowel in these syllables has a duration of 30–50 ms. The high vowels have no allophones. Table 1 demonstrates the changes of quality in light and heavy syllables.

The nasalized vowels are not common. It is possible that they were imported from the neighbouring language, Tupuri, or that they replace a coda [ɲ] which may have existed once in Kera as it does in other Chadic languages; thus *Vɲ becomes Ṽ.

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[3] Contrary to some earlier publications on Kera, there are no true minimal pairs for length because the metrical structure is such that if one vowel is changed from short to long, this has implications concerning the length of the other vowels, but there are some near minimal pairs such as bàaŋa 'elephant' and bɔ̄ŋaa 'speech particle'.

Note: The orthography transcribes shorter /a/ vowels as schwa, when in a light syllable preceding a heavy syllable. The other two non-high vowels are always written as ⟨e⟩ and ⟨o⟩ respectively. From a phonological point of view, this is confusing, but the orthography is now well accepted by Kera speakers and is unlikely to change.

Figure 1 Kera non-high vowels: Duration (ms) and First Formant (Hz).

Further details of the vowel allophones are discussed in Pearce (2008), including the continuum of formant values depending on the phonetic duration of the vowel. As seen in Figure 1, shorter vowels (approx. 30 ms) produce clear undershoot. Longer vowels, (approx. 70 ms, but still phonologically short) arrive at the target (or standard) value for the formant. Vowels between these two values (approx. 50 ms) also have limited undershoot. All phonologically long vowels (approx. 100 ms or more) are produced with the formants of the target value. Thus, the variation in quality is actually driven by the phonetic duration rather than by phonological length.

Kera exhibits the following three types of vowel harmony:

(i) Total harmony within the root. Word-final CV syllables, the historical affixes *a-*, *-a*, the epenthetic *-i* following obstruents, and loans are exempt. Apart from these exceptions, all nouns and verbs comply.

gùdɓùl	'stool'	gùdùl	'song'
dɨmɨ̀mɨ̀	'clothes'	káŋkāw	'wind' (see the transcribed text below)

(ii) Height harmony between the root and suffix in both directions, triggered by the vowels /i ɨ u/. [+high] dominance is rare in the world's languages (Archangeli & Pulleyblank 2007), but the height harmony in Kera cannot be analysed as being the spread of [−high]. (See the non-shaded boxes in Table 2, where height harmony processes occur. Note that the only cases where there is no harmony are in the shaded boxes in the first column, where the input for both root and suffix is [−high]. Clearly, [−high] does not spread.)

(iii) Front ([−back]) and rounding ([+round]) harmony from the suffix to the central vowel of the root:

    cɨ̄r-i → cīirīi 'your head' (see transcribed text)
    ɓɨt-i → ɓítíi 'remove' (see transcribed text)

Rounding with height harmony:

    sar-u → súrúu 'by him' (see transcribed text – ⟨suruŋ⟩ – definite article added)

Table 2 Inalienable nouns with *-i*, *-u* and *-a* possessive suffixes (Pearce 2007b).

Root	-a (3FS) 'her . . .'	-i (2FS) 'your (F) . . .'	-u (3MS) 'his . . .'
i giid- 'stomach'	(gìi)(dɨ̀i)	(gìi)(dɨ̀i)	(gìi)(dùu)
ɨ cɨ̀i(r-) 'head'	(cɨ́i)(rɨ́i)	(cīi)(rīi)	(cúu)(rúu)
u guud- 'behind'	(gùu)(dɨ́i)	(gùu)(dɨ̀i)	(gùu)(dúu)
a kaas- 'hand'	(káa)(sáa)	(kɨ̄i)(sīi)	(kɨ́i)(súu)
ɔ dɔrd- 'voice'	(dɔ̀r)(dàa)	(dùr)(ɗ̀i)	(dùr)(dùu)
ɛ sɛɛn- 'brother'	(séɛ)(náa)	(sīi)(nīi)	(síi)(núu)

Note: Inalienable nouns are nouns which carry possessive suffixes. They normally refer to body parts or family members. All other nouns stand alone with possession being marked by a separate pronoun.

Syllable structure

Vowel length is contrastive and the structure of the syllable is as follows: (C)V, (C)Vː, (C)VC.[4]

Kera is weight-sensitive and in lexical words, strings of two light syllables are avoided in the surface form. Where two light syllables come together in the underlying form, either in the lexicon or as a result of morphophonemics, the vowel of the second syllable will either be lengthened (in phrase-final position) or deleted (mid-phrase, when not a suffix) so that the surface form has no examples of a CVCV string. This is true word-internally and across words with the exception of short function words. The transcribed passage includes the following examples:

/nɛ̀l-ɛ/ → nɛ̀lɛ̀ɛ	'chat' (phrase-finally)
/kayá/ → kɔ́yáa	'then' (phrase-finally)
/fɛ́l-ɛ/ → fɛ́l	'find' (phrase-medially)
/gɔ̀l-ɛ/ → gɔ̀l	'search' (phrase-medially)

The motivation for these processes appears to be a metrical parse at phrase level where light–heavy or heavy syllable sequences are formed by this process. As in some other Chadic languages, CV syllables are permitted to remain at the end of words without being lengthened.[5] Pearce (2006a, 2007a, b) claims that these processes demonstrate foot structure and iambicity, and that there is a strong relationship between the metrical structure and tone and vowel harmony.

Tone

In nouns, there are seven possible melodies. In verbs, there are only three possible melodies. The verb root has a restricted CV structure which can normally only carry one tone. There is an apparent relationship between voicing and tone, which is discussed below. The tonal melodies on nouns with mainly sonorants are as follows:

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[4] There are also a few words (about six) where the nucleus of the final syllable is a nasal (N), such as in dùugŋ́ 'evening'. The best analysis for the syllabic structure in these words is that the final syllable is CN. Nearly all of these words relate to time, so it seems likely that they originally carried a nasal suffix (possibly the definite article) which has since become a frozen form.

[5] Most of the words in the consonant list happen to be of the form where a CV syllable is placed at the end of the word. In Kera as a whole, most words do not have this final short syllable. The list is artificially skewed in order to include words with a similar structure, either (CVC)CV or (CVː)CV. All verbs in this list have a long final vowel. In isolation, the length distinction at the end of a word may not be clear, and it is not contrastive. In continual speech, however, the weight constraints are applied consistently.

H	mə́yán	'river'		L	hɔ̀ynà	'type of spirit'
M	māanī	'co-wife'		LH	hùɗúm	'hole'
MH	māaʔɔ́r	'first rains'		HL	mánhɔ̀r	'ten'
HM	máalāŋ	'bird of prey'				

The tonal melodies on nouns with obstruents are as follows:

H	túrtí	'boat'		L	dàygà	'jar'
M	pāatāl	'needle'		LH	gùukúr	'chicken'
MH	tāatá	'big jar'		HL	táabùl	'table'
HM	púukūl	'type of vegetable'				

The relationship between voicing and tone applies equally to verbs, which have the surface melodies H, L, and LH in the citation form.

Most of the tone is lexical, but there is also some grammatical tone, most notably to distinguish between perfective and imperfective, though there are also segmental changes between these two forms. Some pronouns are also distinguished by tone.

There appears to be a maximum of two tones per mono-morphemic word, but this restriction may simply be a reflection of word length together with the fact that in words with three syllables or more, only heavy syllables can carry tone (Pearce 2006a). Syllables which are not specified for tone gain their pitch from interpolation.

As with many Chadic languages, there is a likely history of tonogenesis where voiced obstruents (known as depressor consonants) have lowered the pitch of the following syllable eventually developing into two tones.[6] At some point a further tone developed for Kera and at the same time the original voicing contrast was largely lost, as has happened in Musey (Shryock 1995). This is partly conjecture, but the process (though not an agreed time scale) has been affirmed for other Chadic languages.

The above examples show the tone and voicing relationship for male speakers who now live in an urban setting. In the Kera spoken by village women (and village men who are less influenced by French), there are three contrastive tones and no voicing contrast. In the speech varieties where French contact appears to play a role (in urban settings and among young males in the village), a voicing contrast has been reintroduced and the two lowest tones are pronounced at a similar or identical pitch. The distinction between words in these two groups is preserved with the voicing contrast.[7] For men who have moved to town from a village location, the L and M contrast is marked by both a difference in pitch and a difference in VOT. More details, including the sociolinguistic implications of these speech varieties and the results of production and perception tests, are given in Pearce (2007b, 2009). A discussion of the relationship between VOT and voicing in Kera is also given in Pearce (2007b). All of the words given in this Illustration as examples of consonants and vowels fit the description above, given that they involve voiced obstruents in syllables with L tone and voiceless obstruents in syllables with M or H tone. A more detailed investigation would show that the VOT of

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[6] The majority of Chadicists claim that tonogenesis occurred at some point in Chadic because there seems to be evidence for a link between voicing and low tone in a number of these languages. This is difficult to prove, however, and some researchers maintain that Afro-Asiatic was tonal with sub-families losing tone.

[7] The voicing contrast is actually a contrast between short and long VOT for most speakers. This is equally true for Chadian French for most but not all speakers. This means that Kera speakers equate the Kera M tone contrast with French voiceless obstruents and the L tone contrast with French voiced obstruents. The Kera H tone is not affected by the contact with French. Although French is not a tone language, there is a slight perturbation in pitch such that voiceless obstruents are produced with slightly higher pitch. This is more marked in Chadian French, presumably because most speakers also speak a tone language, so the differences in pitch are amplified.

<p style="text-align:center">gàaɾà 'plant it (F)'   káajá 'dogs'</p>
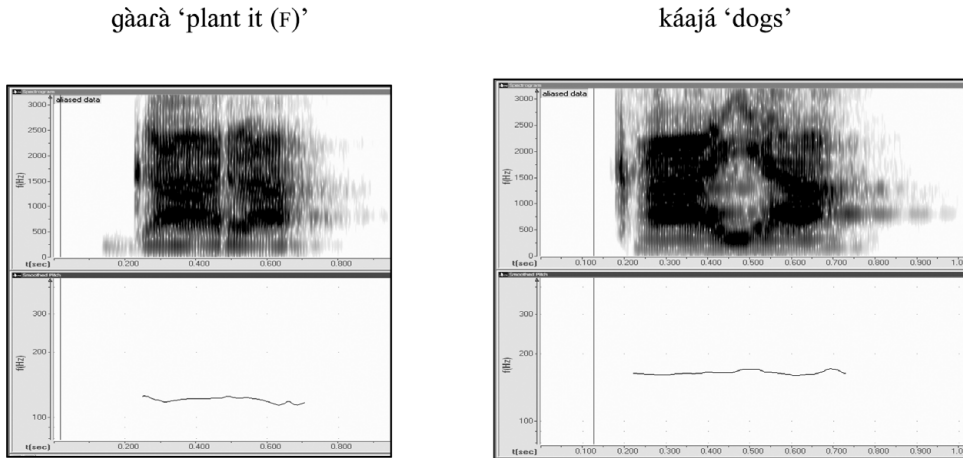
Screen shots made from Speech Analyzer 3.0, SIL software

Figure 2 Links between VOT and pitch.

obstruents in M tone syllables is generally shorter than those in H tone syllables. In Figure 2, the voiced obstruent is clearly phonetically voiced and the F0 is low, whereas the voiceless obstruent is aspirated and the F0 is high. The spectrograms in Figure 2 are typical for this speech variety (although for many speakers the voicing is not true voicing, but rather low positive VOT).

The data in Figure 3 are for illustration only and includes the pronunciation of three words by two distinct speakers. Due to the recording conditions, there appears to be a voicing bar where I claim there should not be one, but the audio track confirms that these claims are in fact reasonable. In any case, the conclusions of this Illustration do not depend on these particular examples. Pearce (2007b) gives details on the VOT measurements and significance. There is no significant difference between the VOT results in village women, and all three tones can co-occur with an onset VOT ranging from about 0 ms to about 50 ms. Town men do sometimes voice the onsets for L tone words, particularly if over-articulating for recordings, but the usual pattern in natural speech is that the VOT has a low positive value.

Orthography issues

The orthography has been established by the Kera language committee in conjunction with SIL and with the approval of the Chadian Ministry of Education. It does not reflect the phonology perfectly, but is unlikely to change as a growing number of books have been produced with the present orthography and it appears to cause no problems to readers. The discrepancies with the phonology are as follows:

- [ə] and /ɨ/ are both written as ⟨ə⟩.
- The phonemes /ɔ/ and /ɛ/ are always written as ⟨o⟩ and ⟨e⟩, regardless of which allophone is used whereas the two allophones of the phoneme /a/ are written separately as ⟨a⟩ and ⟨ə⟩.
- Technically, for the speech varieties where there is little contact with French, the voiced and voiceless obstruents are not contrastive and so should be written with one symbol, but the Kera orthography includes both voiced and voiceless obstruents. In practice, if the following tone is high or mid, the onset obstruent will be written as voiceless, whereas if the tone is low, the onset will be written as voiced. This means that, in general, tone does

Village woman 3 tones, no VOT difference	**Town man** VOT differences between the contrasts labelled L and M; tone difference for H
/ba/ 'negative' L	

L 179 Hz	VOT 25 ms	**L/voiced** 123 Hz	VOT −8 ms

/kɛɗɛː/ 'all' MM

M 233/247 Hz	VOT 13 ms	**L/voiceless** 137/125 Hz	VOT 15 ms

/kɛl/ 'message' H

H 265 Hz	VOT 17 ms	**H** 153 Hz	VOT 34 ms

Note: Town man's Low voiceless value (137) is a little higher than expected, probably because the preceding tone was high, but the tone on the second syllable is as expected.

Figure 3 Comparison of two speech varieties.

not need to be marked in an overt manner, because the consonants are already giving tonal information. For speech varieties with more influence from French, the voicing contrast in the orthography reflects a phonological contrast.

In certain words there is free variation between two tonal melodies; for example, *puukul* 'type of vegetable', cited above with the HM melody, can also have an HL melody, with no change in meaning, but in this case speakers insist on the spelling ⟨puugul⟩ (vs. ⟨puukul⟩ for the HM melody version). In the case of minimal pairs which are only distinguishable by tone (H vs. M or where there are no obstruents to mark L), the word with high tone is marked with an acute accent. There are around twenty words in the Kera lexicon which need to be marked in this way and the reader generally learns the word's spelling with the accent without necessarily realizing the meaning of the accent.

Other conventions in the Kera orthography include the affricates written as ⟨c⟩ and ⟨j⟩, which is common in Chadic languages in general. The approximant /j/ is written as ⟨y⟩. Nasalized vowels are written as ⟨ã⟩, ⟨ɔ̃⟩, etc. Long vowels are written with a double letter, as ⟨aa⟩, ⟨ii⟩, etc. The medial glottal stop is written as an apostrophe, but the glottal stop before vowel-initial words is not reflected in the orthography. The best way of writing the labiodental flap is still under discussion, with suggestions including ⟨vb⟩, ⟨wh⟩ and the IPA symbol ⟨ⱱ⟩.

'The North Wind and the Sun'

Transcription
This transcription marks three tones and voicing. In practice this will vary according to the speech variety.

də̀jàŋ hɔ̄j àn tʃə́wáŋ d̀ı káŋkāw ɨ́sɨ́ŋ bɨ̀ nèlɛ̀ɛ jī ásáŋ hùlùm tʃāw jɨ̄ɨ ɨ́sɨ́ŋ bɨ̀ wáatɛ́ɛ hùlùm tʃāw dàŋ d̀ı d̀ımɨ̀ımɨ̀ d̀ı súrúŋ hà?àŋ áŋ gɔ̀l làa míndí 6ít d̀ımɨ̀ımɨ̀ mɔ̄ɔ míndí 6ít d̀ımɨ̀ımɨ̀ŋ wīr sār hùlmàa mɔ̀ɔ áŋ gɔ̀l lɨ̀ g̀ım mɔ̀ɔ kə́jáa káŋkāw míntí tɛ́ɛ sə̄6ākī káŋkāw kɔ̀ːrɔ́ŋ fādī bɨ̀ d̀e ā 6ít d̀ımɨ̀ımɨ̀ŋ wī hāŋ d̀ı sə̄6ākī gík kīk kík kík... míntí tés 6ít d̀ımɨ̀m kī hùlŋàn nāa nī mɔ̀ɔ hùlùm dɛ́ŋ ás káŋkāw kə́jàŋ wī kārkáŋ d̀ımɨ̀ːmɨ̀ núutúu 6á? 6á? 6á? 6á?... fādī kə̄jāa káŋkāw gə̀jàŋ gə̀jàŋ gə̀jàŋ... kās dʒíi wī nə́káŋ bɨ̀ fél d̀ımɨ̀ımɨ̀ bàa kə̄jāa tʃə́wáŋ kólɔ́ŋ d̀ı g̀ım dàa tʃə̄wāŋ kólɔ́ŋ gàj dàŋ à dʒɨ̀màŋ pɨ́ŋɨ́ŋ kə̄jāa à dɔ̀ɔ tʃə́wáa sár hùlmà fādī hùlùm dɛ́ŋ gɔ̀l kə̄jāa wī míntíi káj kɔ̄ŋ húɓúŋ dɛ́ɛ kɔ̄ŋ húɓúŋ áblàw wɨ́sɨ́ŋ kə̄jāa wī fɔ́ktɔ́ŋ d̀ımɨ̀ımɨ̀ wɔ̄rāa fə̄kát fə̄kát fə̄kát... fādī tʃə́wáŋ háráŋ ānkāj dàŋ ā míntí káŋkāw àŋ gɔ̀s kɔ́l lɨ̀ kɨ́m tāŋ míntí míndì 6ɨ̀tíŋ d̀ımɨ̀ımɨ̀ kás hùlmà hāā mɔ̀ɔ kə̄jāa káŋkāw kɛ̄l tə́wáŋ bɨ̀dɔ̀ːnà fādī káŋkāw sénéŋ wārnā kúj náa fādī

Orthographic transcription
Dəyaŋ hɔ̃y, anə cəwaŋ də kaŋkaw əsəŋ bə nele. Yə asaŋ hulum caw, yə əsəŋ bə waate hulum caw daŋ, də dəməəmə də suruŋ ha'aŋ, áŋ golə la. Mindi 6iti dəməəmə mo? Mindi 6iti dəməəməŋ wəra sar huluma mo? Áŋ golə la kəm mo. Kəya, kaŋkaw minti té sə6aki. Kaŋkaw kooroŋ fadɪ bə de a 6iti dəməəməŋ. Wə hāŋ də sə6aki gik gik gik gik... Minti té sə 6iti dəməəmə kə hulum ŋa nanaanə mo. Hulum deŋ ase kaŋkaw kəyaŋ, wə gargaŋ dəməəmə nuutuŋ 6a' 6a' 6a' 6a'... fadɪ. Kəya kaŋkaw gəyaŋ gəyaŋ gəyaŋ... kas ji. Wə nəkaŋ bə fele dəməəmə ba. Kəya cəwaŋ koloŋ də gəm da. Cəwaŋ koloŋ gay daŋ, a

jəmaŋ pəŋəŋ kəyaŋ, a doo cəwa sar huluma faɗi. Hulum ɗeŋ a gole kəyaŋ, wə minti: «Kay! Koŋ huɓuŋ ɗe! Koŋ huɓuŋ ablaw!» Wə əsəŋ kəya, wə foktoŋ dəməəmə wəra fəkat fəkat fəkat . . . faɗi. Cəwaŋ haraŋ anəkay daŋ, a minti: «Kaŋkaw, àŋ gosə kole la kəm táŋ. Minti mindi ɓətəŋ dəməəmə kas huluma hãã mo?» Kəya kaŋkaw, kel təwaŋ bədoona faɗi. Kaŋkaw sereŋ warna kuy na faɗi.

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References

Archangeli, Diana & Douglas Pulleyblank. 2007. Harmony. In Paul de Lacy (ed.), *The Cambridge handbook of phonology*, 353–378. Cambridge: Cambridge University Press.

Ebert, Karen. 1975. *Sprache und Tradition der Kera (Tschad)*, Teil I: *Texte*. Berlin: Reimer.

Ebert, Karen. 1976. *Sprache und Tradition der Kera (Tschad)*, Teil II: *Lexikon*. Berlin: Reimer.

Ebert, Karen. 1979. *Sprache und Tradition der Kera (Tschad)*, Teil III: *Grammatik*. Berlin: Reimer.

Olson, Kenneth S. & John Hajek. 2003. Crosslinguistic insights on the labial flap. *Linguistic Typology* 7(2), 157–186.

Olson, Kenneth S. & John Hajek. 2004. A crosslinguistic lexicon of the labial flap. *Linguistic Discovery* 2(2), 21–57.

Pearce, Mary. 1999. Consonants and tone in Kera (Chadic). *Journal of West African Languages* 27(1), 33–70.

Pearce, Mary. 2006a. The Interaction between metrical structure and tone in Kera. In Bert Remijsen & Vincent J. van Heuven (eds.), *Between stress and tone*: Special issue of *Phonology* 23(2), 259–286.

Pearce, Mary. 2006b. Evidence against voicing spread in Kera. *UCL Working Papers in Linguistics* 18, 345–355. Department of Phonetics and Linguistics, University College London.

Pearce, Mary. 2006c. Enhancement between voice onset time (VOT) and F0: Evidence from Kera voicing perception. Presented at special session on Enhancement and Multiplicity of Cues in Speech at the Acoustical Society of America, 151st Meeting, Rhode Island. [Abstract in *Journal of the Acoustical Society of America* 119(5), 3269.]

Pearce, Mary. 2007a. Iambicity in Kera. *37th Annual Conference on African Linguistics*, 66–76. Somerville, MA: Cascadilla Press.

Pearce, Mary. 2007b. *The interaction of tone with voicing and foot structure: Evidence from Kera phonetics and phonology*. Ph.D. dissertation, University College London. [Forthcoming in CSLI Publications, Stanford University.]

Pearce, Mary. 2008. Vowel harmony domains and vowel undershoot. *UCL Working Papers in Linguistics* 20, 115–140. Department of Phonetics and Linguistics, University College London.

Pearce, Mary. 2009. Kera voicing and tone interaction. *Lingua* 119(6), 846–864.

Shryock, Aaron. 1995. Investigating laryngeal contrasts: An acoustic study of the consonants of Musey. Ph.D. dissertation, UCLA.