The Sound System of Thok Reel

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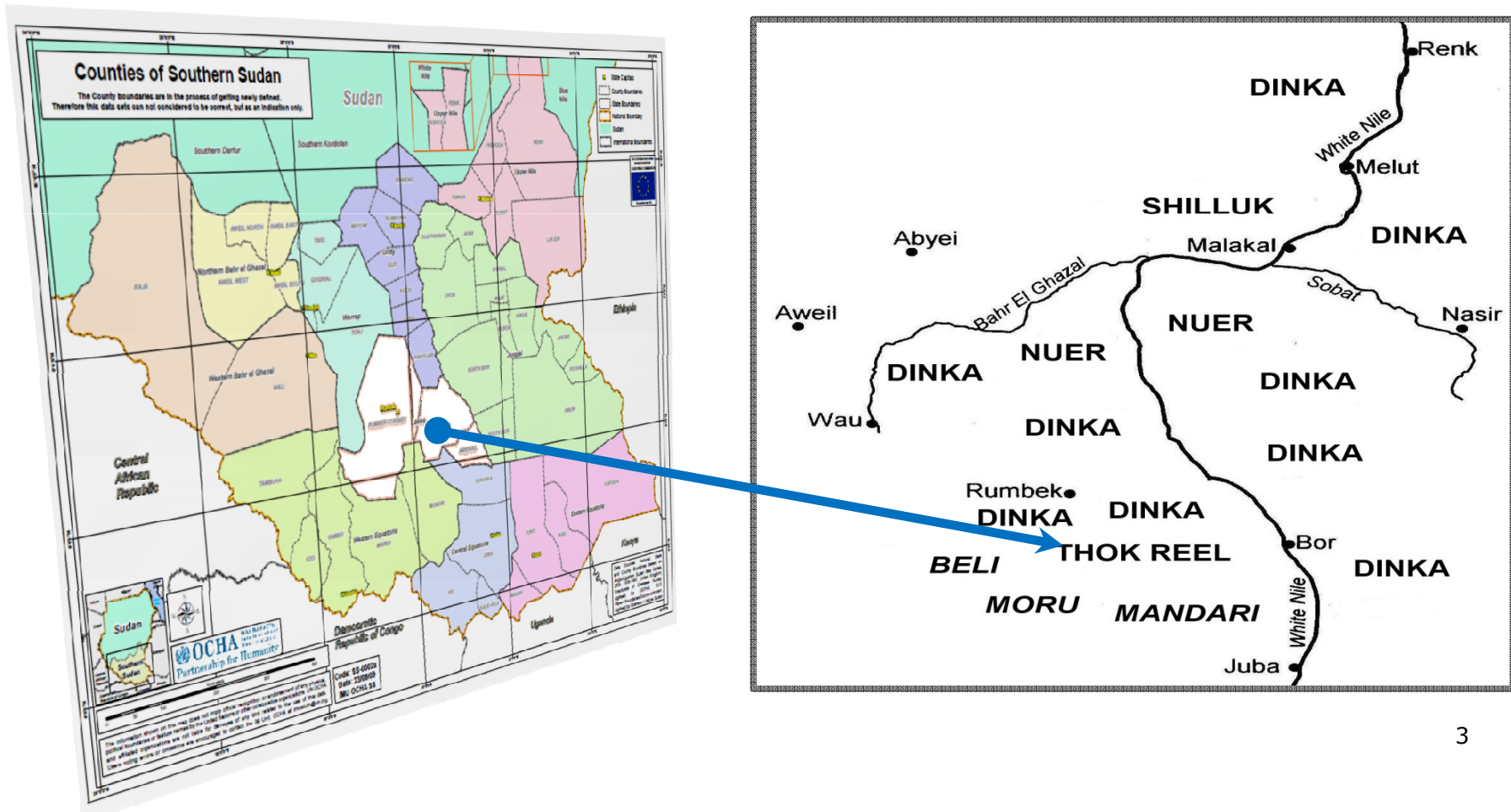
About this presentation

- Thok Reel – a hitherto undocumented language (a word list in Roettger & Roettger (1989) and anthropological study by Burton 1981a, 1981b, 1987)
- Step 1 in the description: the sound system
- Phonemic inventory
- Phonetic realisations of the phonological distinctions

- The structure of the presentation:
  - background: the language and its speakers
 - outline of syllable and word structure
  - consonants
  - vowels
  - tone

Geographical location and neighbouring languages

□ Thok Reel – Western Nilotic, Dinka-Nuer subgroup; Yirol West county, Lakes State, Southern Sudan

Thok Reel and its speakers

- Thok Reel is spoken by approximately 50,000 people known as Atuot

Atuot

Reel   Apak

Luac   Jilek   Akot   Jikeyi Kuek

THOK REEL   THONG APAK

(a Dinka dialect)
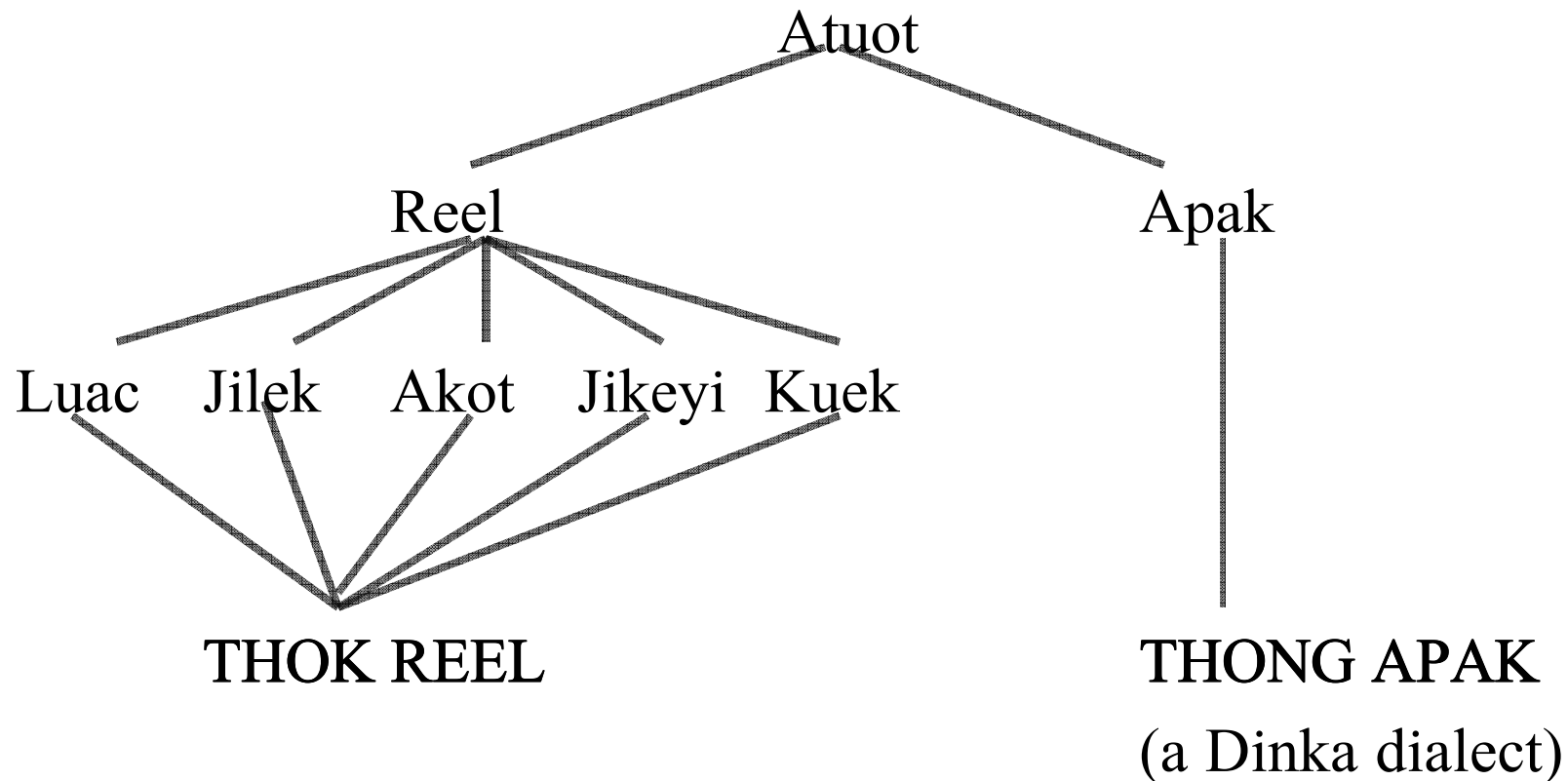
Thok Reel and its speakers cont.

- The speakers distinguish two dialects:Thok Reel Cieng Luai and Thok Reel Cieng Nhyam
- The difference is reported to be purely lexical

Thok Reel Cieng Luai (solid line)
lit. 'language of the land of Luac Reel'

Thok Reel Cieng Nhyam (broken line)
lit. 'language of the front side of the Reel land'

Dinka-speaking sections (dotted line)

CEIC

AGAR

JILEK   L.Yirol

LUAC

APAK

L.Anyii

R. Payii

JIKEYI

AKOT

KUEK

L. Iropo

ALIAB
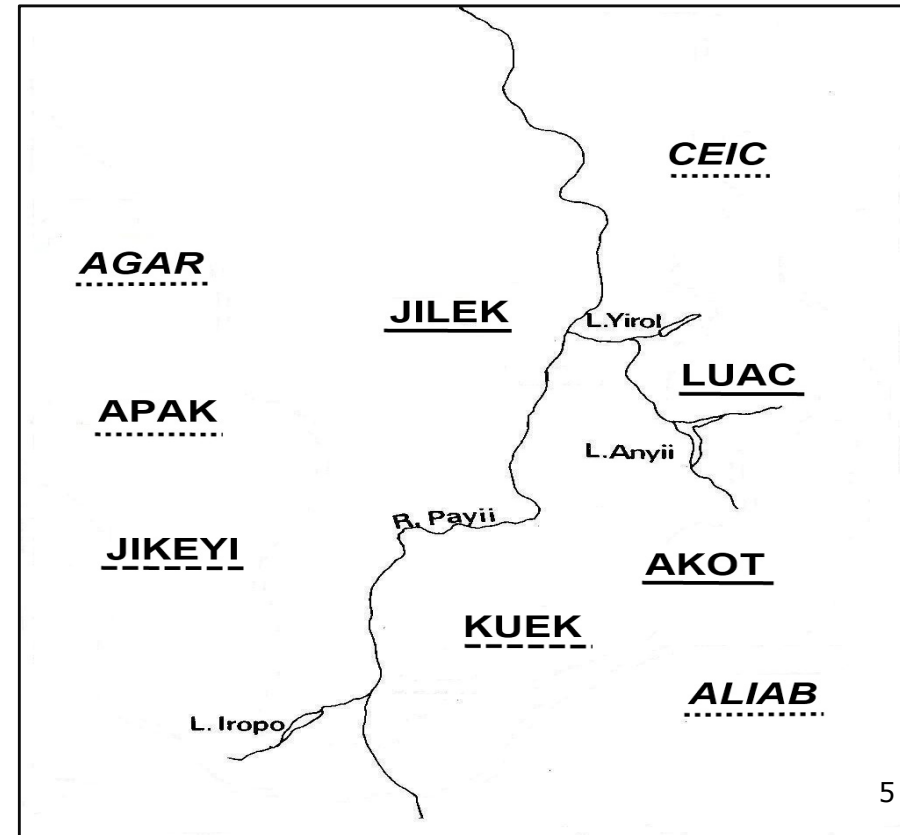
Syllable structure

C (j/w) V (V) (V) C	CV(V)	V(V)
gàt 'child'	càa 'PST\PASS'	è declarative particle
cɛ�̈ŋ 'sun'	cɛ́ 'PST\1SG'	
ɟɔ̤̂ɔr 'forest'	pî̤i 'water'	áa existential particle
rɛ̤́ec 'rat'	lá̤ 'animal\SG\GEN'	
tṳuut 'male animal'	cà̤ 'husband\SG\GEN'	
gàaat 'children'		
jwi̤C 'head'		
cjɛ̤̈ŋ 'home'		
gwɔ̤̂p 'skin'		
rwâaj 'conversation'		
nwɛ̤̂ɛɛr 'human'		

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Word structure

- Most words are monosyllabic

- Morphology is expressed by alternations of phonological parameters of the monosyllabic roots and also by affixation

- A small number of polysyllabic words

native polysyllabic words	native compounds	borrowed words
ad̪ɛ̀ɛr 'water pot'	kwac-reng male name	àmáaná 'meaning' (from Arabic)
ỉŋâaw 'so and so'	pan-ka̤ar village name	gálám 'pen' (from Arabic)
èkèC 'bitter'		
dàapóook 'decorated pot'	mapuor-dit town name	
makéc 'yellow'		

Consonants

- Twenty consonant phonemes

	Labial	Dental	Alveolar	Palatal	Velar	Glottal
Voiceless	p	t̪	t	c	k	ʔ
Voiced	b	d̪	d	ɟ	g	
Nasal	m	n̪	n	ɲ	ŋ	
Lateral			l			
Vibrant			r			
Glides	(w)			j	(w)	

Consonants: near-minimal pairs

páaap 'spread\1SG'   bâaar 'boldness'   mác 'fire\SG\NOM'

t̪áaal 'cook\1SG'   d̪ậl 'boy\PL\NOM'   ŋjáaar 'like\1SG'

tậaaṭ 'build\1SG'   d̥ậaw 'distribute\1SG'   nậaw 'kill\1SG'

cáam 'eat\1SG'   ɟaṭ 'tree\SG\NOM'   ɲál 'girl\SG\NOM'

kậaar 'dry\1SG'   gàaat 'child\PL\NOM'   ŋâaw 'vomit\1SG'

ʔậaal 'pound\1SG'

láaak 'insult\1SG'   ràak 'lulu.tree\SG\NOM'

wáaar 'change\1SG'   jâŋ 'cow\SG\NOM'

Consonants: phonetics

- The lateral is always palatalised
  - /rêeel/   [rêeelʲ]   'Reel people'
  - /lwàc/   [lʲwàc]   'Luac'

- In slow deliberate speech dental stops are sometimes produced as interdentals

- Labial, dental and palatal stops can be realised as fricatives
  - /àpák/   [àɸák]   'Apak'
  - /ṭók/   [sǫk]   'mouth'
  - /cę̀K/   [çę̀k]   'woman'

Consonants: phonology and phonotactics

- Glottal phoneme is only found in onset position
  - two allophones [ɦ] in context of breathy vowels and [ʔ] elsewhere

    ʔɔ̰́t   [ɦɔ̰́t]   'house'
    ʔɔ́ṭ   [ʔɔ́ṭ]   'heads'

- /n̪/ only occurs in complex onsets (followed by /j/)

- The rest of the consonants occur in simple and complex onsets

- Voicing is only distinctive in onset position, and more specifically, root-initially

- Root-final consonants are voiced in intervocalic position and voiceless elsewhere

Vowels: vowel quality

□ Seven vowel phonemes /i, e, ɛ, a, ɔ, o, u/

bîir 'spear\3SG'   gṵ́uur   'father\2SG'

bêer 'willow.for.roofing\PL'   gó̤oor   'search\3SG'

bɛ̰́ɛr 'tallness (length)'   gɔ̰̂ɔɔr   'mark\3SG'

bâaar 'boldness'   gá̤aar   'body.mark\SG'

□ The phonemes combine with the suprasegmental distinctions – voice quality and vowel length
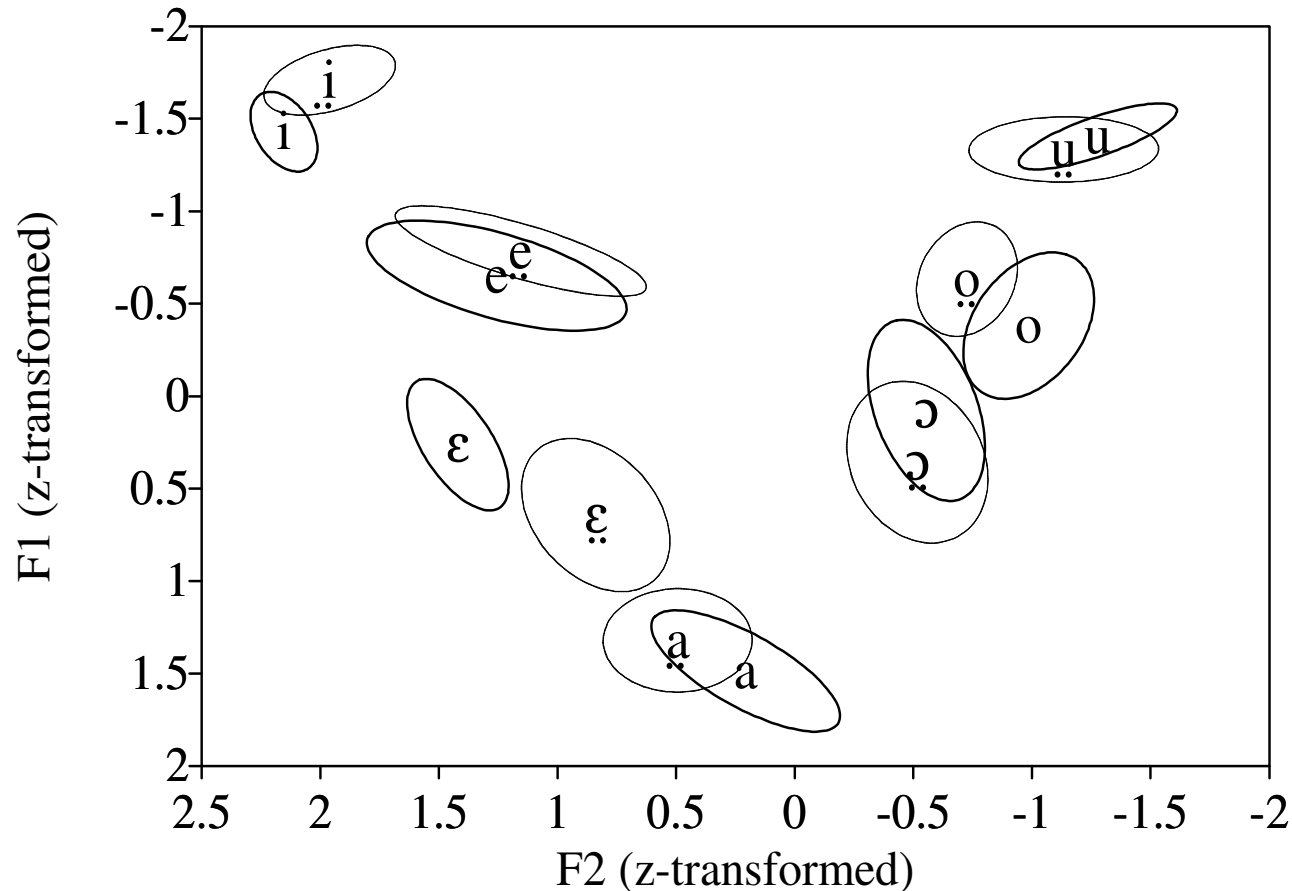
Vowels: voice quality

□ All vowels appear in two voice qualities – modal and breathy

|				
i	**bîiir**	'spear\3SG'	**bɪ̤iir**	'drum\3SG'
e	**rêeel**	'Reel\PL'	**rè̤eel**	'Reel\PL\GEN'
ɛ	**wêɛɛr**	'scattering'	**wɛ̤́ɛɛr**	'night\SG'
a	**cáaar**	'to.aim'	**cá̤aar**	'black'
ɔ	**kɔ̀ɔɔr**	'forearm\SG'	**kɔ̤̂ɔɔr**	'dry\3SG'
o	**ròook**	'molar\SG'	**rò̤ook**	'molar\PL'
u	**gúuur**	'remove\3SG'	**gṳ́uur**	'follow\AP\3SG'

Vowel space

- Means (symbols) and standard deviations (ellipses) for the two voice qualities of the seven vowel phonemes. Solid line – modal voice, broken line – breathy voice.

Voice quality: spectrum

Spectrum representations calculated over a > 40 ms window centered on the temporal mid point of the vowel /i/

Modal voice
bîiir 'spear\3SG'

Breathy voice
bi̤iir 'drum\3SG'
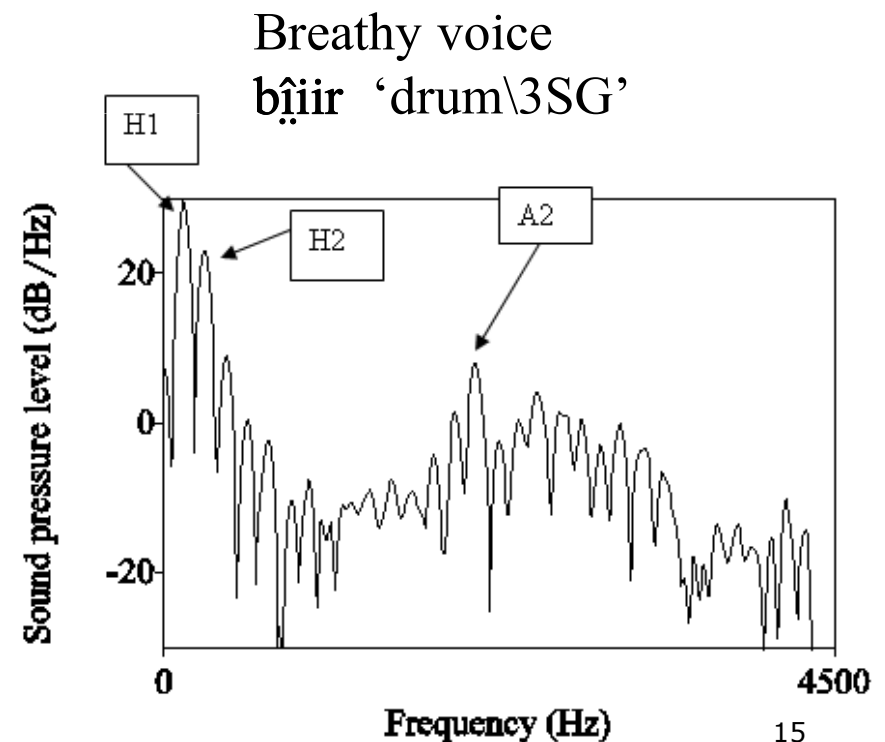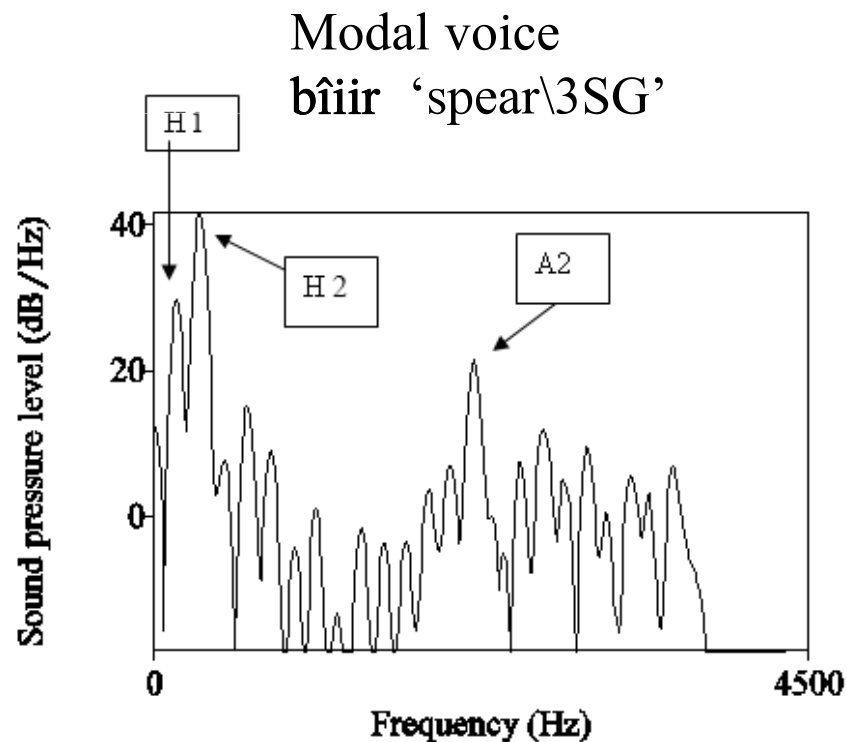
Breathy vowel /ɛ̤/

- Lower and more centralised than its modal counterpart
- Fairly close to /a̤/
- Perceptually it is often difficult to tell the difference between the breathy /a̤/ and /ɛ̤/

kɛ̤̀c   'bite\R\3SG'   ~   ká̤c   'bite\R\1SG'

ŋɛ̤́ɛc 'milk\3SG'   ~   ŋá̤ac   'milk\1SG'

lɛ̤̂ɛŋ 'good\PL\PRED'   ~   lâ̤aŋ   'good\PL\ATTR'

- The native speakers also tend to disagree about the quality of these vowels
- But...

	F1	F2	(averaged)
ɛ̤	599	1838	
a̤	712	1520	

Vowels: vowel length

□ Vowels can be short /V/, mid /VV/ or long /VVV/

ríŋ 'meat\PL'   rî̤iŋ 'meat\SG'   rî̤iiŋ 'run\PET\3SG'

rêl 'white.ant\SG'   rêel 'Reel\SG'   rêeel 'Reel\PL'

tɛ́t 'dig\1SG'   tɛ́ɛt̪ 'build\AP\3SG'   tɛ́ɛɛt̪ 'build\3SG'

ŋàc 'know\AP'   ŋáac 'milk\1SG'   ŋàaac 'milk\AP\NF'

gwɔ̤̂r 'adjacent.siblings' gwɔ̤́ɔr 'follow\3PL'   gwɔ̤̂ɔɔr 'elephant\SG'

kwôt̪ 'rain\SG'   kwóot̪ 'blow\AP\NF'   kwôoot̪ 'blow\3SG'

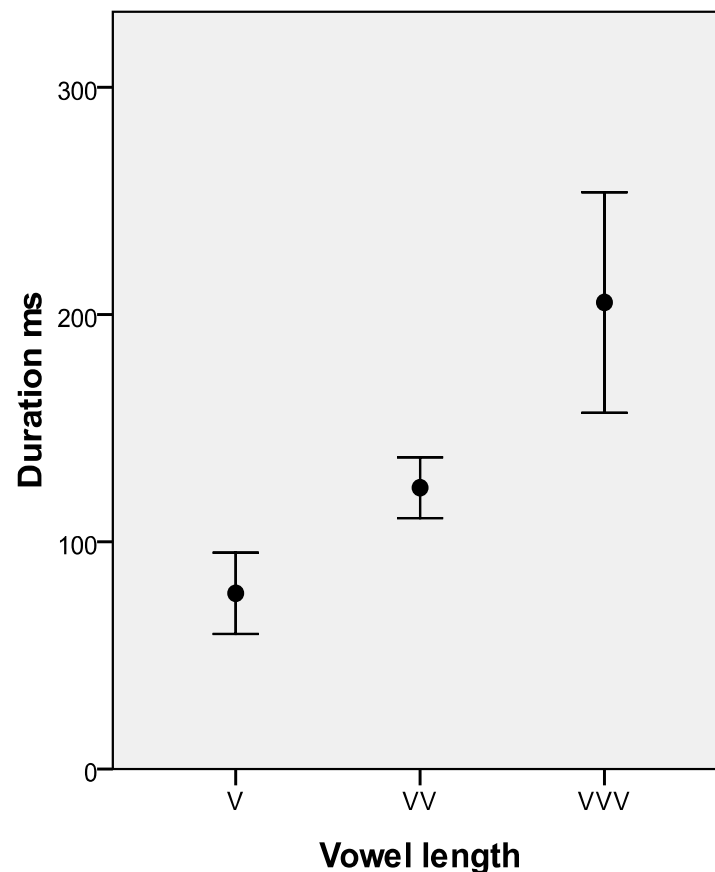bṳ̂l 'drum\SG'   bṳ̀ul 'roast\3SG'   bṳ̂uul 'roast\AP\3SG'

Vowel length: duration measurements

- Means (dots) and standard deviations (whiskers) for durations of Thok Reel vowels

V = short vowel   77ms

VV = mid vowel   123ms

VVV = long vowel   205ms

Tone: inventory

□ Three tonemes: High (H), Low (L) and High-Low (HL)

	H			L
cɔ́w	'husband\SG'		cɔ̀w	'husband\PL'

	H			HL
wɛ̰́ɛr	'night\SG'		wɛ̰̂ɛr	'dung\SG'

|	L			HL
tèeet	'hand\SG'		têeet	'hand\SG\ACC'

□ Tone is used to distinguish lexical items and to signal morphological distinctions

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Tone: phonetics

- Narrow frequency range in which the highs and the lows are realised ('speaking in the middle'), esp. Luac speakers.

- Narrow frequency range = considerable overlap between the tonemes in certain contexts.

- The averaged frequencies across a H toned and a L toned syllables in a minimal pair cɔ́w 'husband\SG' ~ cɔ̀w 'husband\PL' uttered in isolation by a male Luac speaker are 115 Hz and 106 Hz, respectively.

- The distinction between the phonetic realisation of the tonemes is mainly in terms of f0 alignment

- Alignment refers to the way in which pitch movements map onto the segmental string (Ladd 2008:169).

Tone: f0 alignment H and L

H ców 'husband\SG'
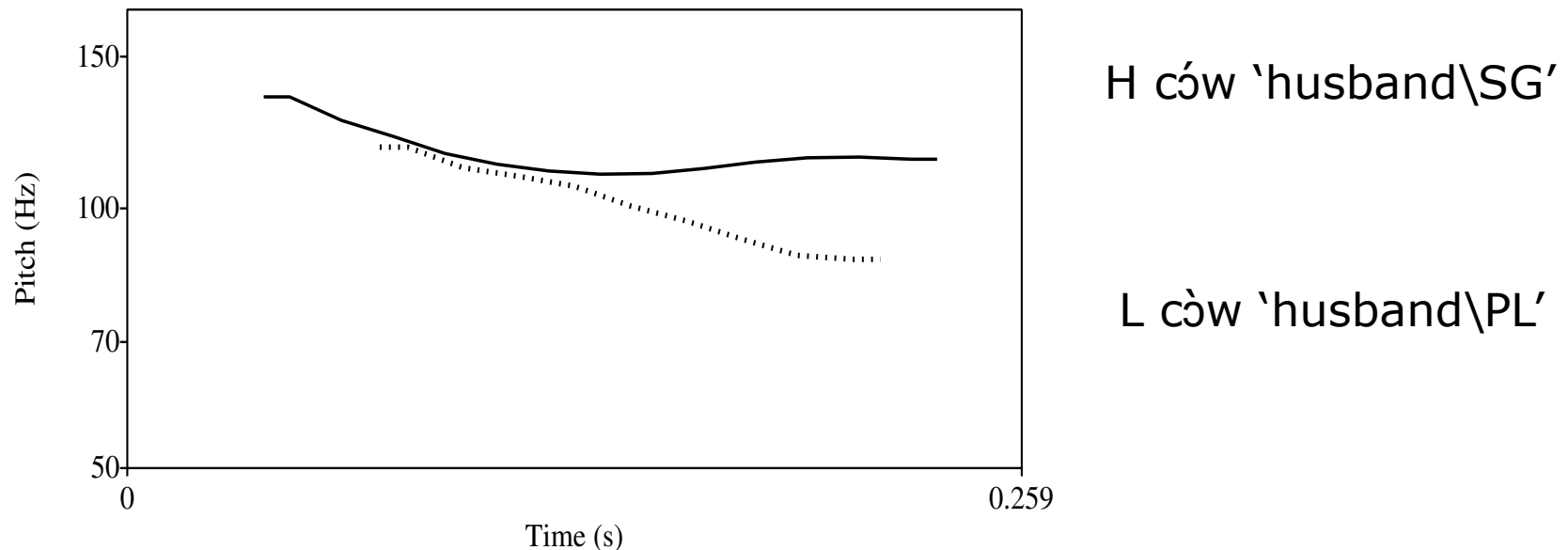
L còw 'husband\PL'

F0 alignment in a minimal pair for tone uttered in isolation:
ców 'husband\SG' H (solid line) vs. còw 'husband\PL' (dotted line)

- The difference is in f0 alignment at the end of voicing for the syllable (=end of f0 tracks) which roughly corresponds to the glide portion.

Tone: f0 height and voice quality

- F0 is much lower in syllables with breathy vowels than in syllables with modal vowels
- The perceived difference in pitch in a H toned minimal pair for voice quality cáaar 'to.aim' vs. cá̰aar 'black' can lure us into thinking that we are dealing with different tonemes (H and L).
- Again, f0 alignment helps us to determine that that we are dealing with H tone (L is realised with a falling trajectory in phrase-final context)
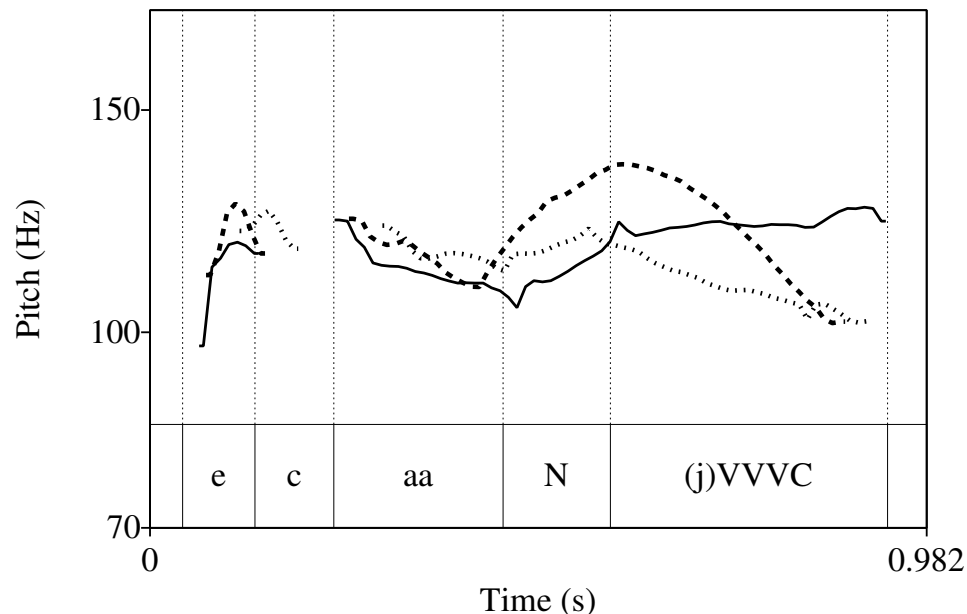
cáaar 'to.aim' (dotted line)

cá̰aar 'black' (solid line)
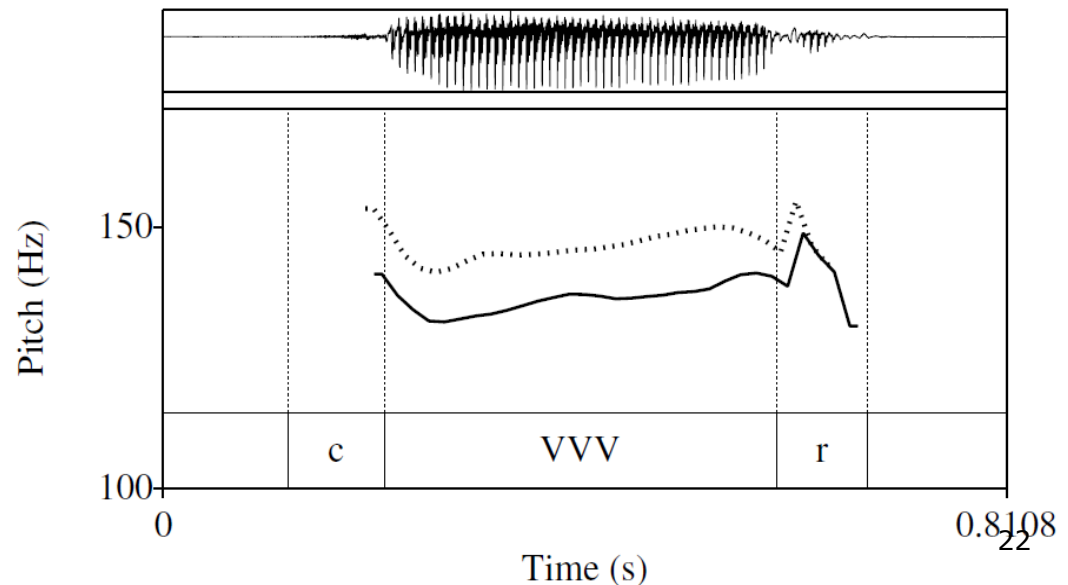
Tone: f0 alignment H, L, HL

- The difference between the three tonemes is most salient in phrase-final position following a L tone
- H (solid line) somewhat rising f0 trajectory
- L (dotted line) small rise followed by a fall (small rise is not perceptually salient)
- HL (broken line) rise-then-fall (perceptually salient)

è-càa   nóooŋ
DECL-PST\PASS   bring\NF
It has been brought.

è-càa   ŋ̄jàaam
DECL-PST\PASS   put.in.mouth\NF
It has been put into the mouth.

è-càa   ŋ̄jâaar
DECL-PST\PASS   like\NF
It has been liked.

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Summary

- Predominantly monosyllabic language
- Typical Western Nilotic consonant inventory
- Seven vowel phonemes
- Two-way voice quality distinction
  - The distinction between breathy and modal vowels is in terms of energy distribution
  - /ɛ̤/ and /a̤/ a vowel merger on its way?
  - Three-way vowel length distinction
- Three tonemes H, L, HL
  - Narrow frequency range in which the contrastive pitch levels are realised
  - The tonemes differ in f0 alignment

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