Double downstep in Northern Toussian

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July 18, 2025

Contents of this presentation

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- Give a tour of Northern Toussian grammar

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    - A prosodic effect that downsteps tones after a M at the right edge of a phonological phrase
    - Grammatical tone indicating that there is no object or oblique argument immediately before the verb

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When both of these effects target the same syllable, this results in double downstep

- The drastic lowering of the pitch of the tone, resulting in a surface pitch much lower than is typical for a single instance of downstep

Contents of this presentation

- Introduction to the Toussian languages
- Sketch of parts of the grammar
  - Segmental phonology inventory
  - Relevant morphosyntax
  - Basic tonology
- Downstep
- Interaction of tone with prosodic structure
- Absent preverbal (nonsubject) argument marking
- Double downstep
- Conclusion

The Toussian languages

The Toussian languages

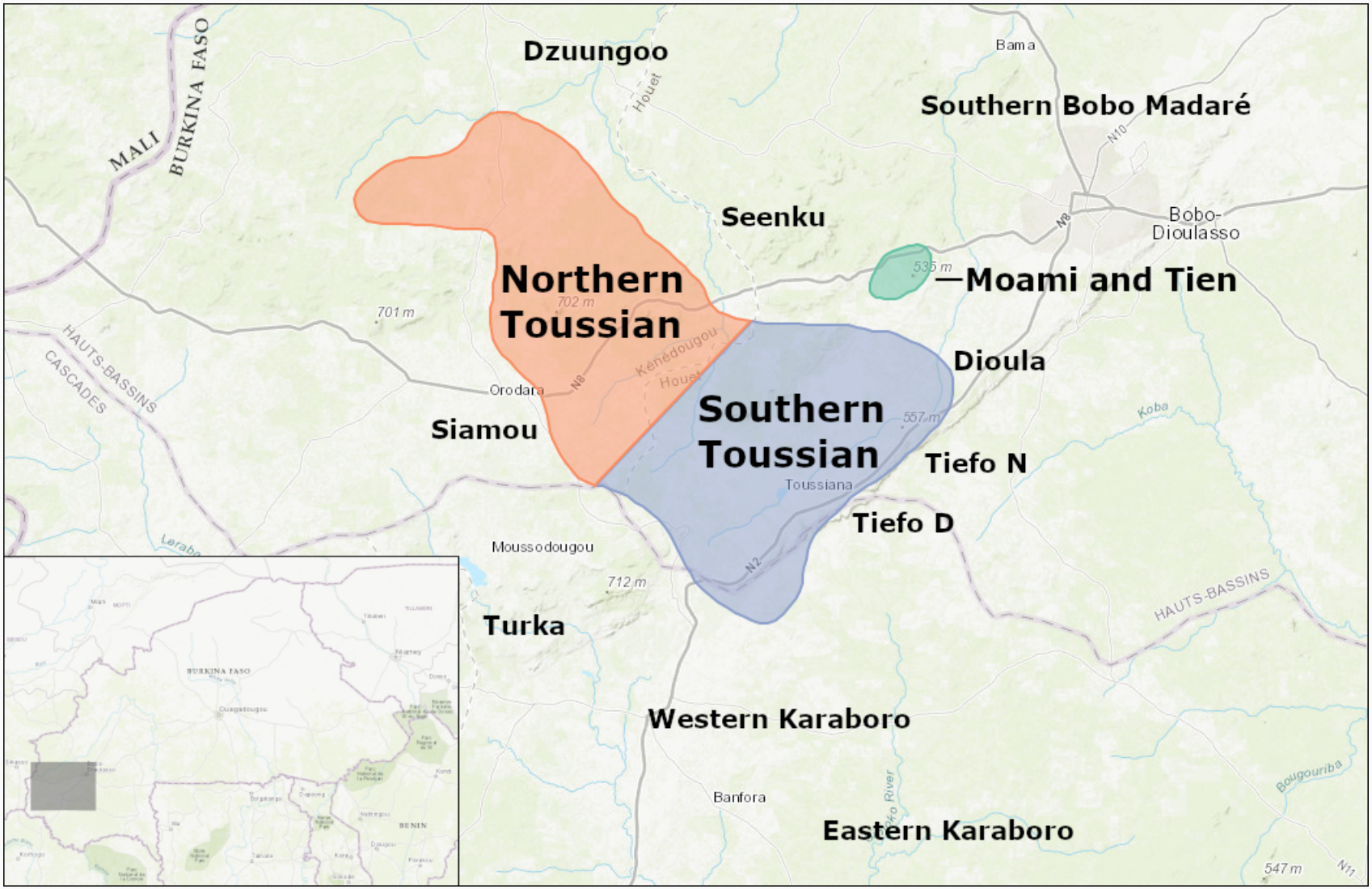
Two, potentially three Toussian languages

- Northern Toussian (20,000–40,000 speakers)
- Southern Toussian (20,000–40,000 speakers)
- A variety spoken in the villages Moami and Tien (<3,000 speakers)

Niger Congo phylum of uncertain genetic relationship

- Associated with Gur and Senoufo languages because of structural similarities

Toussian languages

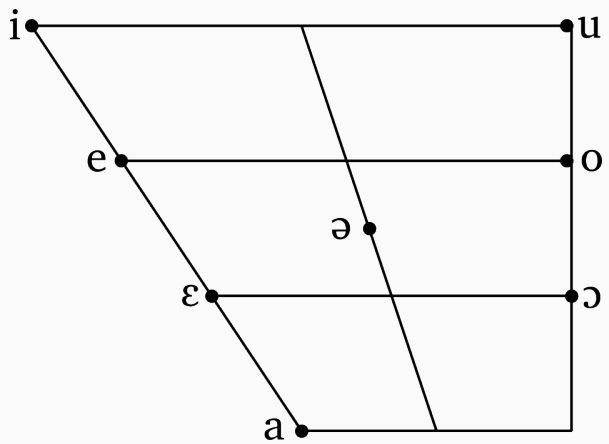


Segmental phonology

Segmental phonology

Large vowel inventory

- 8 oral vowels
- 7 nasal vowels
- 2 oral pharyngeal vowels [aˤ ɛˤ]
- 2 nasal pharyngeal vowels [ãˤ ɛ̃ˤ]



Segmental phonology

	Bilabial	Alveolar	Palatal	Velar	Labiovelar
Oral stops	p b	t d	ɟ	k	(g͡b)
Nasal stops	m	n	ɲ	ŋ	
Fricatives	f (v)	s (z)			
Trills		r			
Approximants		l	j		w

Basic Northern Toussian morphosyntax

Northern Toussian word order

- Northern Toussian has SAuxOVX word order
  - Aux contains various tense, aspect, mood, and polarity (TAMP) particles, a handful of adverbials, and auxiliary verbs
  - X houses
    - adjuncts (most adverbs, adverbial postpositional phrases, etc.)
    - oblique arguments (postpositional arguments selected for by the predicate)

Northern Toussian word order

(1) a. S Aux O V X
àlî kə́ dā kɔ̰́ kò sɛ̄
Ali NEG Daou give meat with
‘Ali didn’t give Daou meat’

b. S Aux O V X
Ádámá pwŏ bár pɛ́y núnɔ́ŋ
Adama come.APVA work do yesterday
‘Adama came to work yesterday’

Northern Toussian word order

- SAuxOVX word order is an areal feature of West Africa (Güldemann 2007)
- The basic word order in most Mande languages and Senoufo languages
- The default order in some languages of the following families:
  - Songhai
  - Kru
  - Gur
- Grammatically-conditioned in
  - Adamawa-Ubangi
  - Kwa
  - Atlantic

TAMP marking

Unmarked clauses are perfective

(2) ádámá búr ɟá
Adama bread watch
‘Adama watched the bread’

TAMP marking

Imperfective clauses are marked by the marker *n*= ~*ǹ*= . It attaches

- to the object, if present (3a)
- to the verb otherwise (3b)

(3) a. ádámá **ǹ**=búr ɟá
Adama IPFV=bread watch
'Adama is going to watch the bread'

b. ádámá **n**=kṑ
Adama IPFV.APVA=walk
'Adama is going to walk'

TAMP marking

Other TAMP categories are expressed by auxiliary markers that occur in the Aux position between the subject and object

(4) a. Past tense

ɛ́mîl **á** ˡpé bû rɔ̌
Emile PST COP.APVA house in

‘Emile was in the house’

b. Progressive aspect

ádámá ˡ**pə́** ǹ=bár pɛ́y
Adama PROG.APVA IPFV=work do

‘Adama is working’

c. Polarity

ádámá **kə́** bár pɛ́y
Adama NEG work do

‘Adama did not work’

TAMP marking

Multiple auxiliary markers can co-occur, and are divided among eight positions (P1–P8)

- The positions are determined by the possible relative ordering of auxiliary markers

TAMP marking

P1	Adverbials	*fáná* ‘also’ *kwàn* ‘in any case’
P2	TAM particles	Past *á* (PST) Irrealis *sə́* (IRR) Evidential *wú* (EVID)
P3	Modals	Conditional *à* (pə́) (COND) Concessive *àtò* Subjunctive *rí* (SBJV)
P4	Polarity markers	Negative *kə́* (NEG) *kə́tò* ‘no longer’ Negative subjunctive *kə̀pə́* (NEG.SBJV)

TAMP marking

P5	Adverbial	*yē* ‘truly’
P6	Adverbials	*mɛ̄* ‘more; (no) longer’
		Immediate sequencing *pɔ̄* (IS)
P7	Functional auxiliary verbs	Prospective *pī* (PROS)
		Progressive *pə́* (PROG)
		tó ‘again’
		kwɔ́/fā̰ ‘be able’
P8	Lexical auxiliary verbs	*pwó/pī* ‘come’
		kɛ́y/tyō~tyū~tyā ‘go’

TAMP marking

Ordering is strict between positions

- *á* PST is a P2 marker
- *ká* NEG is a P4 marker,
- *á* must necessarily precede *ká*.

(5) a. ɛ́mîl **á** **ká** ˈpé bû rɔ̌
Emile PST NEG COP.APVA house in
'Emile wasn't in the house'

b. * ɛ́mîl **ká** **á** ˈpé bû rɔ̌
Emile NEG PST COP.APVA house in
'Emile wasn't in the house'

TAMP marking

Ordering is free within positions

- P2 markers *á* PST and *sə́* IRR can occur in either order with respect to one another
- Some markers that share the same position are in complementary distribution

(6) a. ɛ́mîl **á** **sə́** ˈpé bû rɔ̌
Emile PST IRR COP.APVA house in
'Emile might have been in the house'

b. ɛ́mîl **sə́** **á** ˈpé bû rɔ̌
Emile IRR PST COP.APVA house in
'Emile might have been in the house'

Basic tonology

Basic tonology

Three contrastive level tones:

(7)

H	*jí*	‘year’
M	*jī*	‘laughter’
L	*jì*	‘hair’

Basic tonology

Three two-tone contour tones:

(8)	HM	*dɛ̃˞*	‘dream (N)’
	HL	*dɛ̂˞*	‘stone’
	LH	*bǒ*	‘father’

Basic tonology

Three three-tone contour tones, all of which can be hosted on CV syllables:

(9)	HLH	*bê´*	‘again’
	LHL	*sɔ̰̀*	‘comportment’
	LHM	*lɛ̰̄*	‘maternal uncles’

In total: 9 tone patterns on monosyllables

Basic tonology

Tones are assigned per-syllable on polysyllabic nouns, meaning

- Any syllable can host a contour tone
- There is no predictable tone mapping process

(10)	HL.L	blêmpàɣ	‘orphan’
	H.L	íkràɣ	‘stomach’
	H.HL	búmblâɣ	‘hyena’

Downstep

Downstep

- The modulation of the speaker's pitch range has an important role in many tone languages
- The lowering or compression of the pitch range is called *downstep*

Downstep

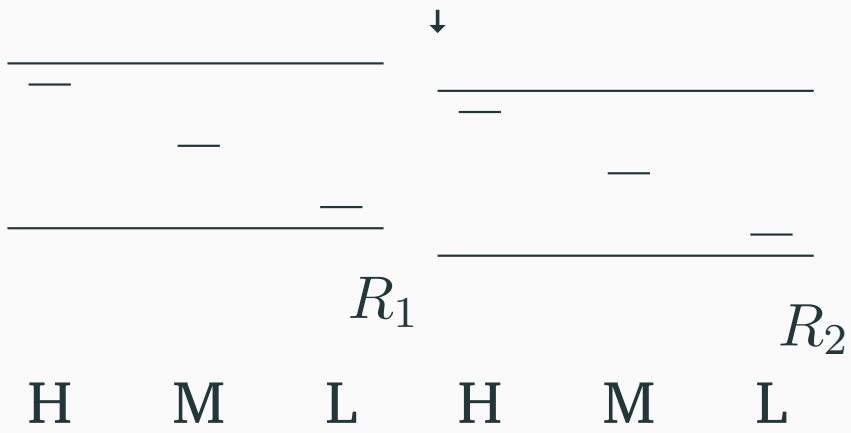


Figure 1: Register lowering, i.e., downstep

Downstep

- There are two broad categories of downstep
  - Automatic downstep: triggered when a higher tone follows a lower tone
    - L H → L ˈH
    - M H → M ˈH
    - L M → L ˈM
  - Non-automatic downstep: downstep triggered for other reasons, e.g.,
    - Grammatical tone
    - Floating tones

Downstep

Downstep is rife in Northern Toussian

- It has both automatic and non-automatic downstep
- Non-automatic downstep occurs in multiple constructions

Automatic downstep in Northern Toussian

(11) a. /L M/ → [L ˈM]

pɛ̄ à ˈnɔ̄ŋ fī
husband COND person insult

‘If the husband insults the person’

b. /L H/ → [L ˈH]

sú à ˈbú ɟá
father COND leopard watch

‘If father watches the leopard’

c. /M H/ → [M ˈH]

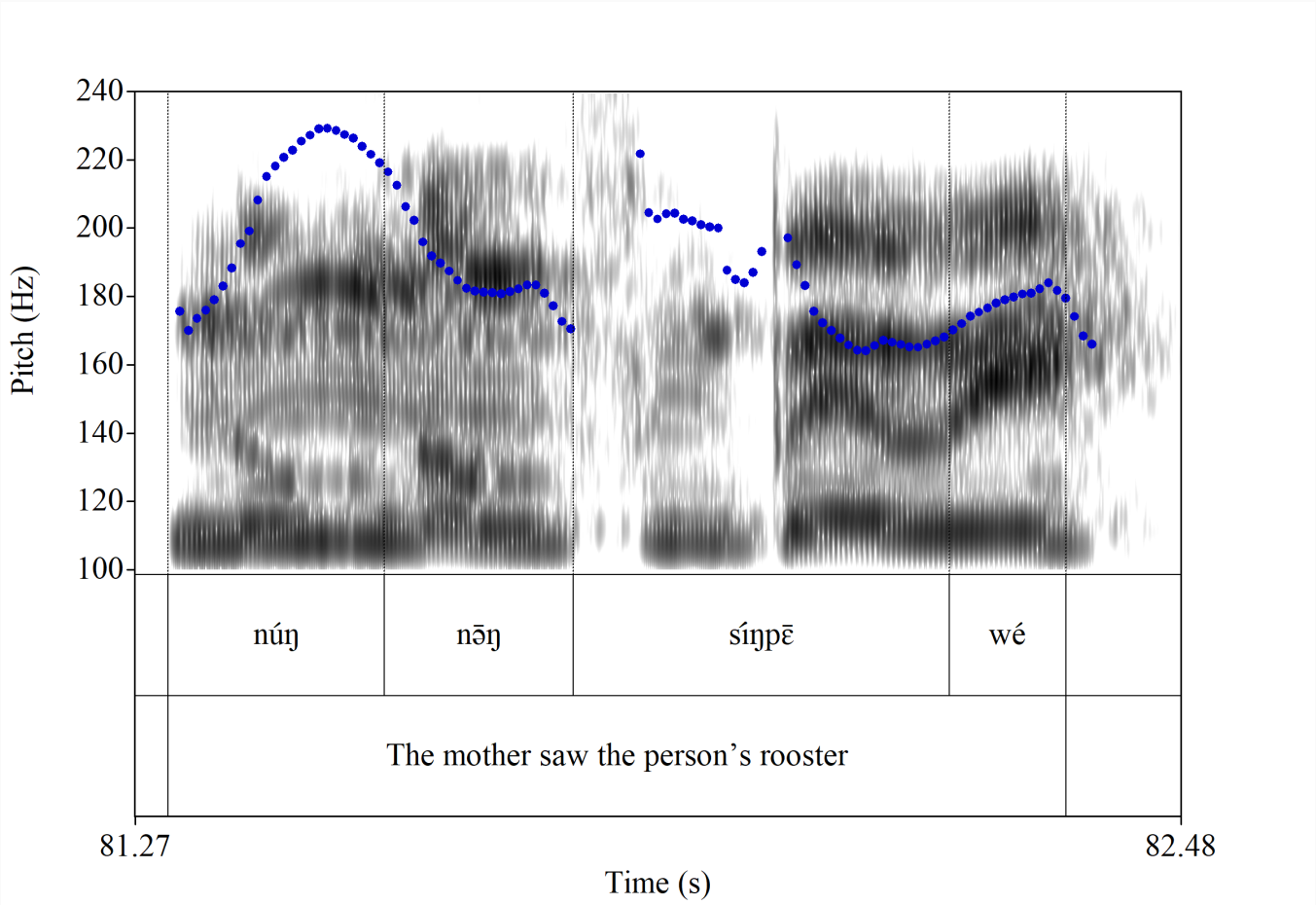
sú pɛ̄ ˈɟá
father husband watch

‘father watched the husband’

Automatic downstep in Northern Toussian

Phonetically, in Northern Toussian,

- A downstepped H has a higher pitch than a preceding M



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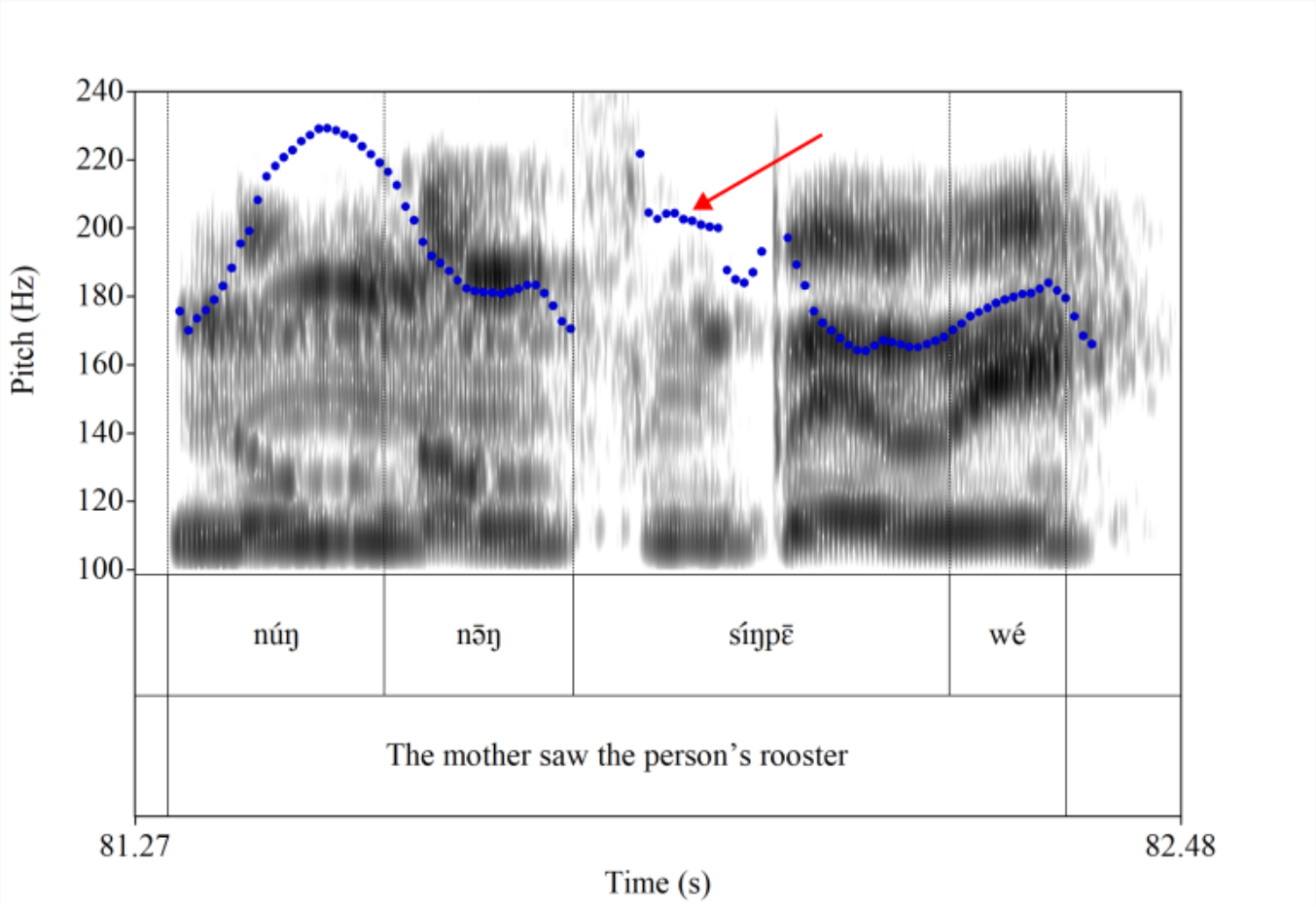

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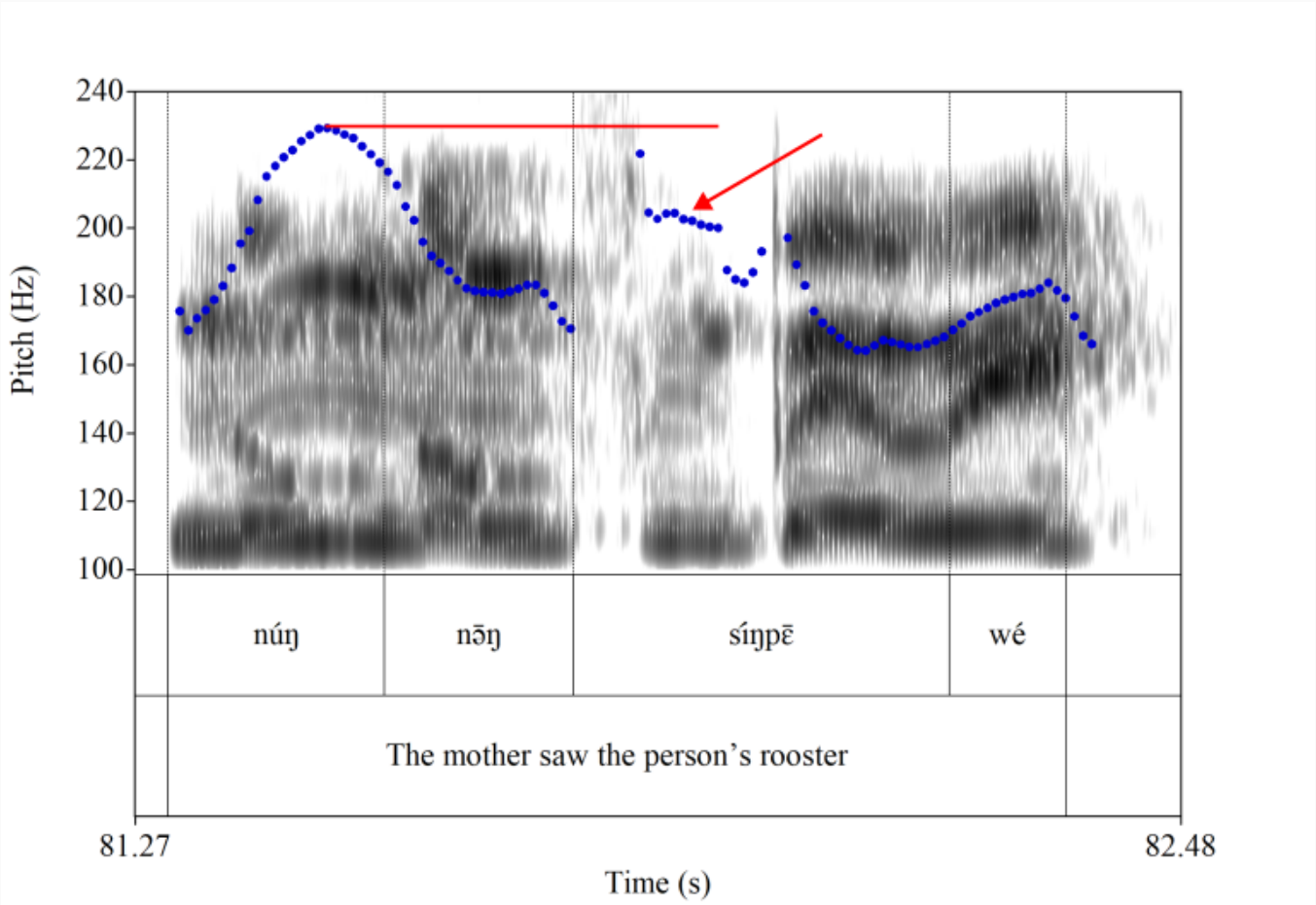

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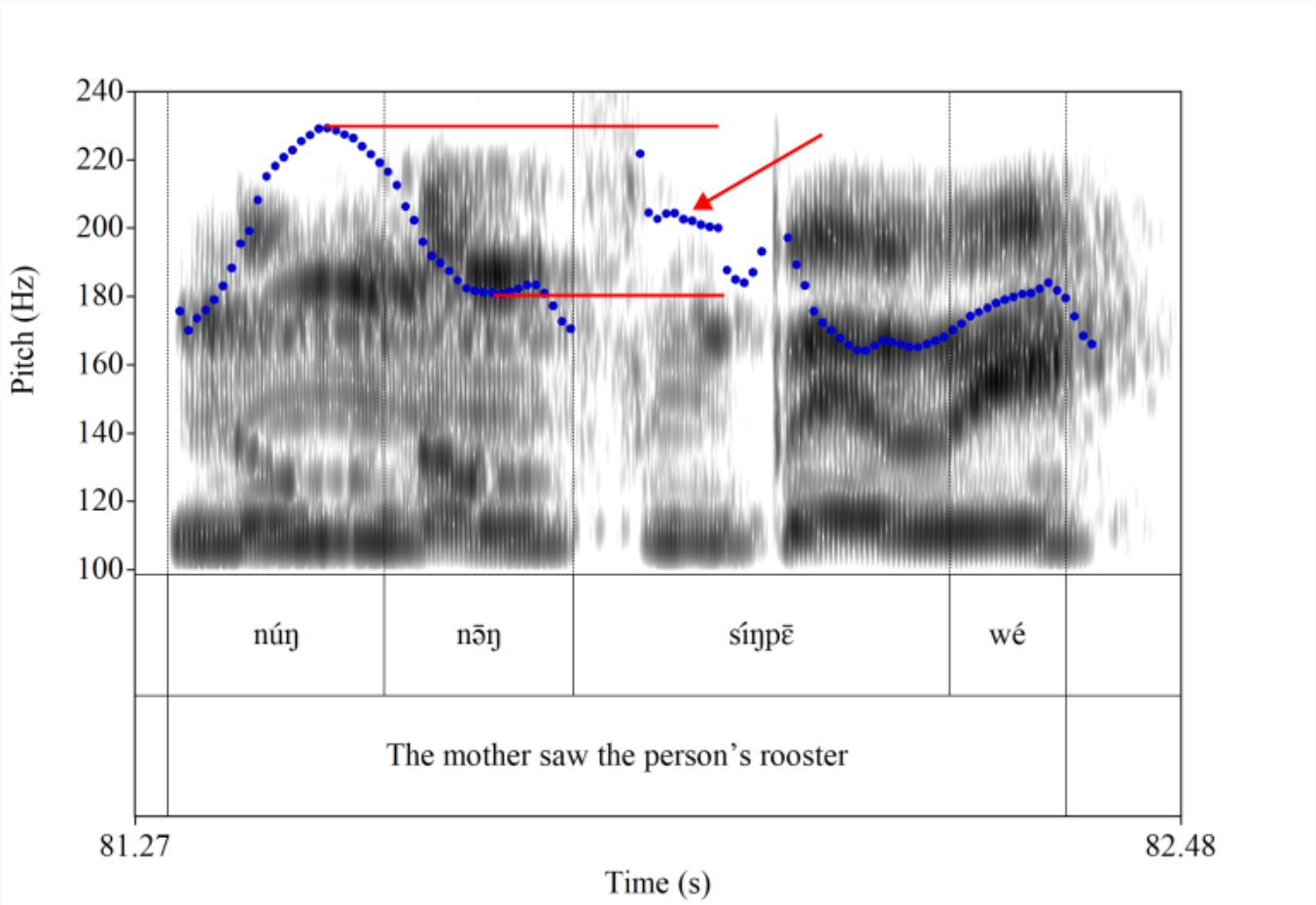
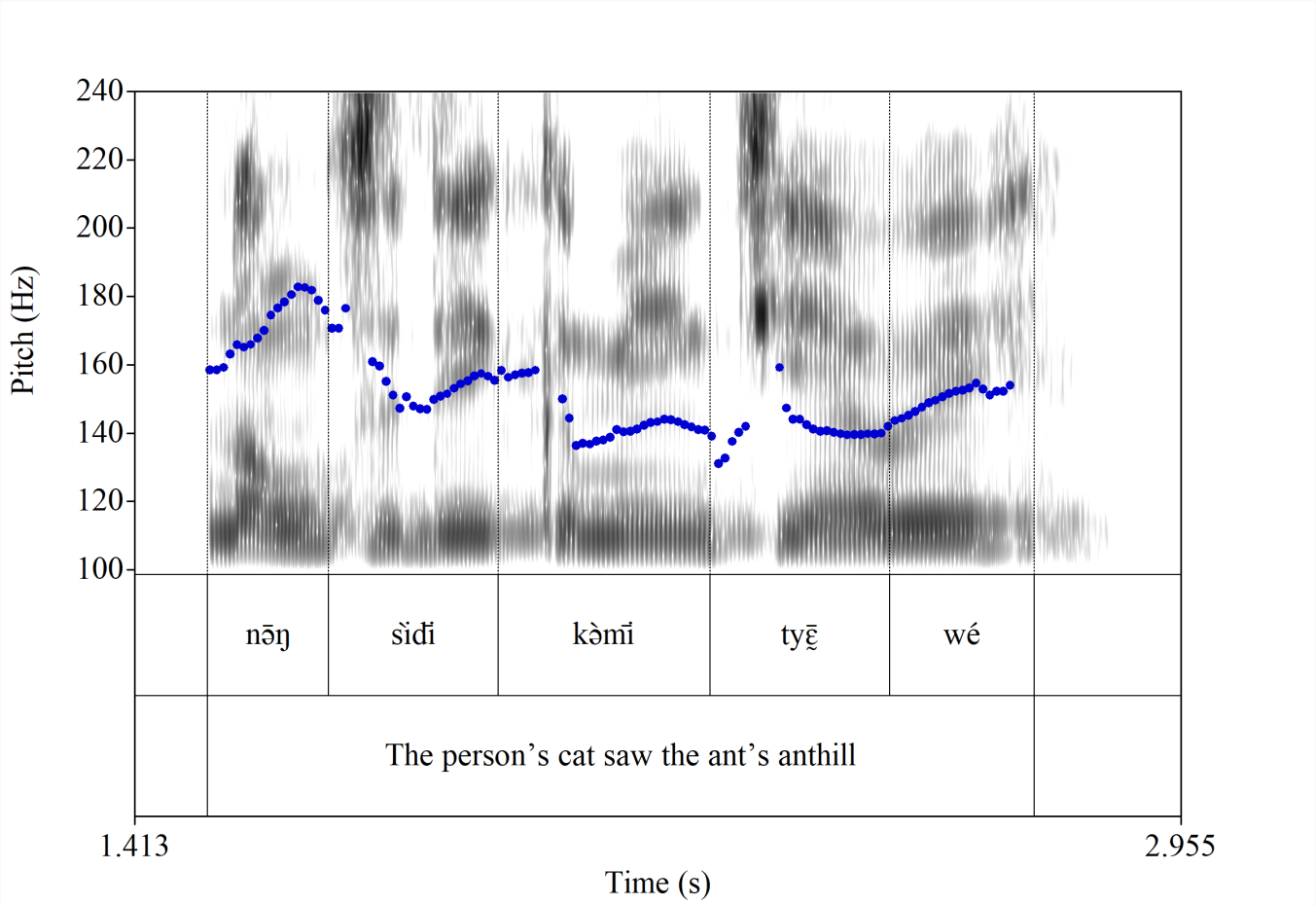


Automatic downstep in Northern Toussian

Phonetically, in Northern Toussian,

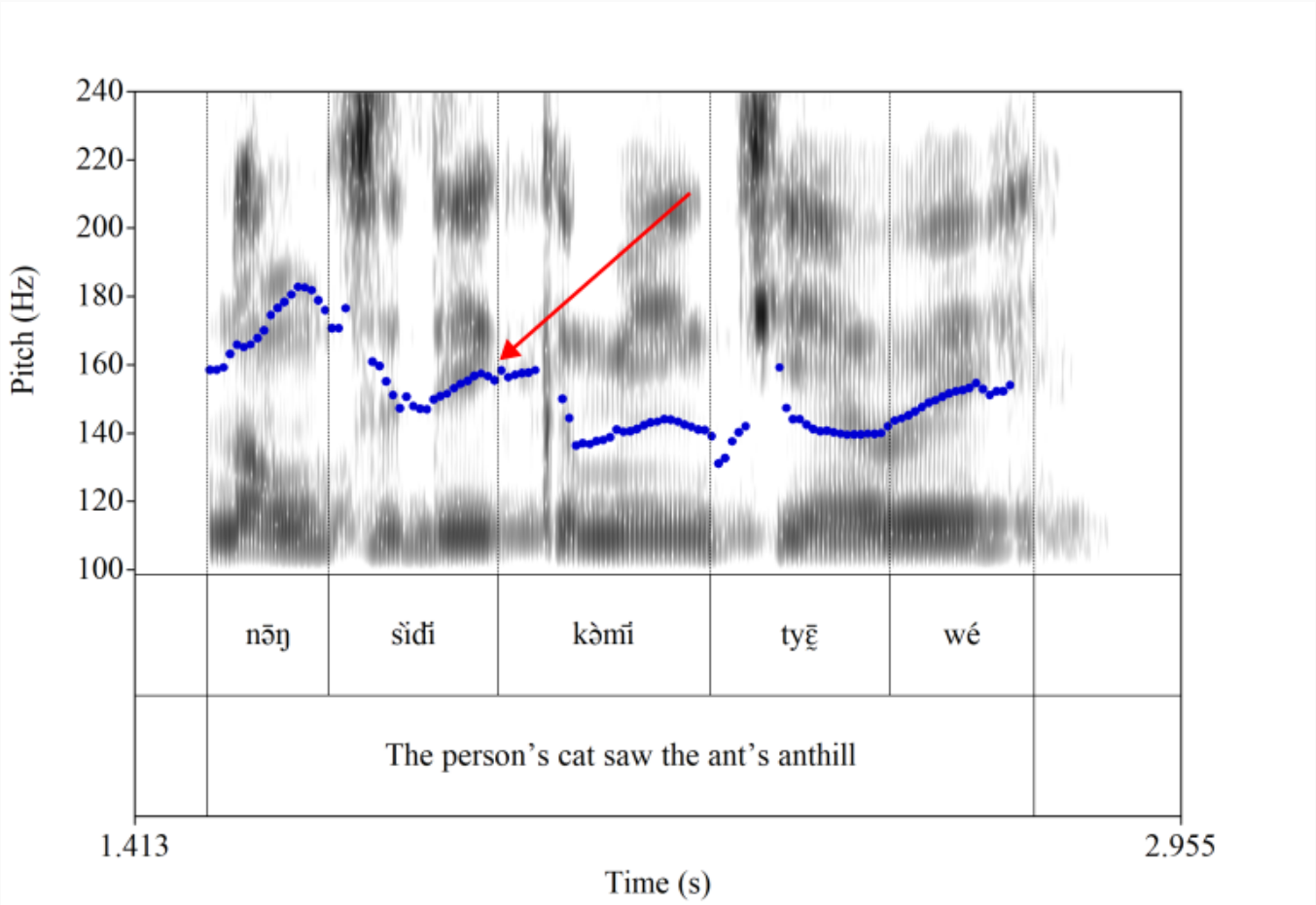
- A downstepped M has a higher pitch than a preceding L



Automatic downstep in Northern Toussian

Phonetically, in Northern Toussian,

- A downstepped M has a higher pitch than a preceding L



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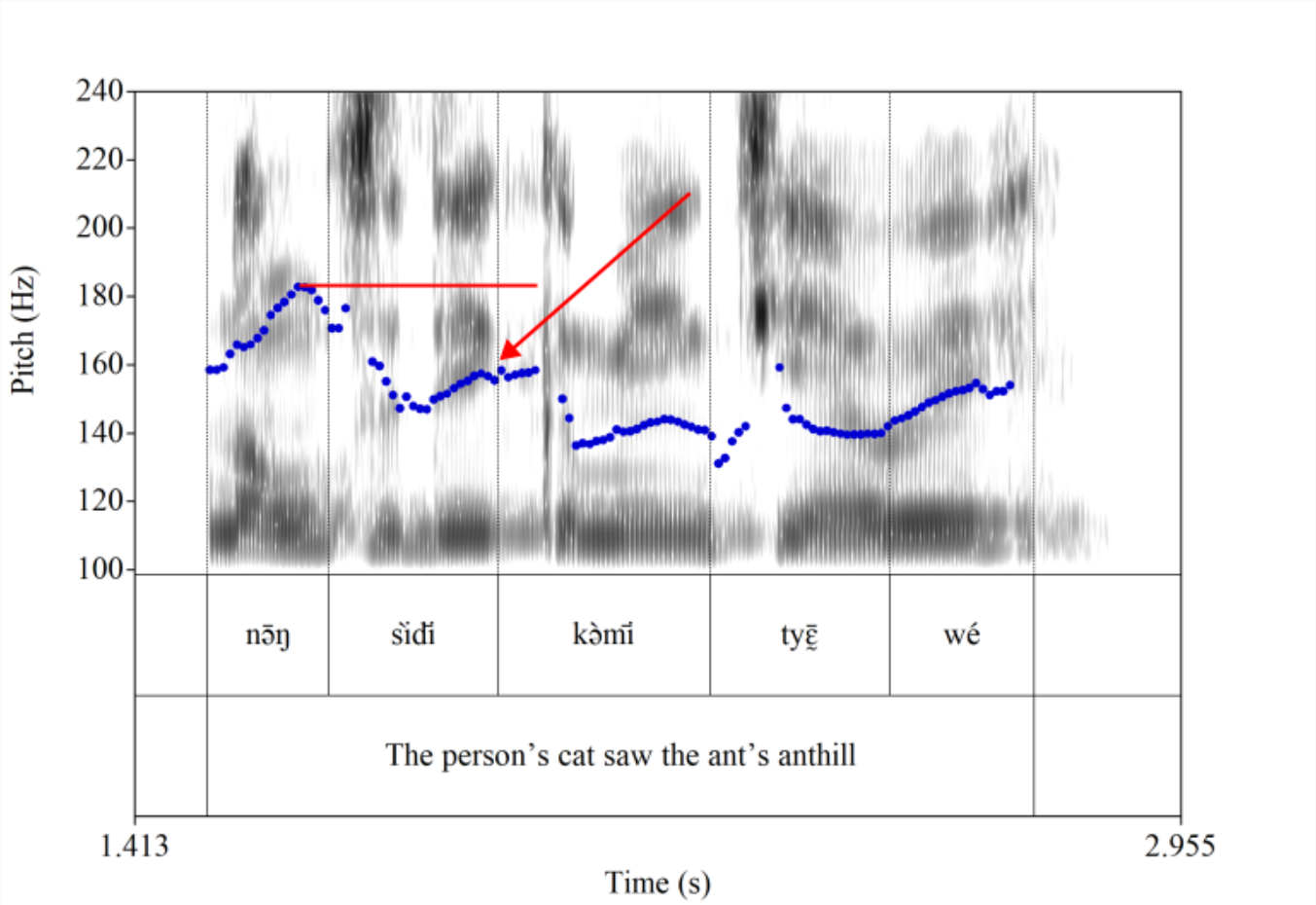

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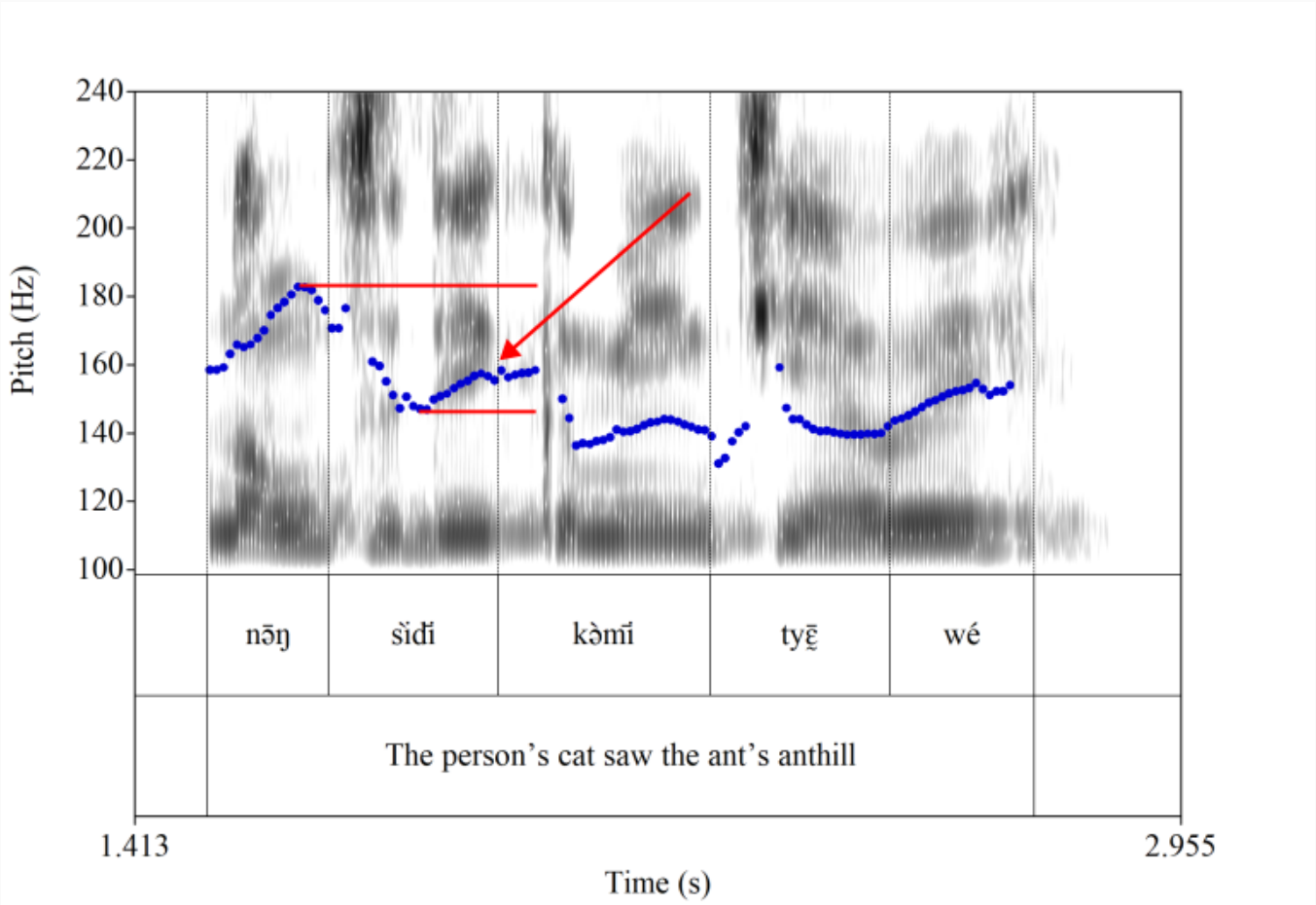

Automatic downstep in Northern Toussian

I now turn to instances of tonal phenomena that result in non-automatic downstep

Prosodic boundary downstep

Prosodic boundary downstep

- There is a contrast where the second M of a sequence of two Ms is downstepped in some contexts (12a), but not others (12b)

(12) a. nɔ̄ŋ ꜜpɛ̄ ɟá
person husband watch
'The person insulted the husband'

b. sú pɛ̄-nɔ̄ bwɔ̄ fī
father husband-PL 10 insult
'The father insulted ten husbands'

Prosodic boundary downstep

When does downstep occur and when doesn't it occur?

- First, let's look at instance with downstep
- Then, instances without downstep

Prosodic boundary downstep

- An M object is downstepped following an M subject (13a)
- No downstep with other identical tones (13b)

(13) a. nɔ̄ŋ ꜜpɛ̄ wé
person husband see
‘The person saw the husband’

b. ádámá sú wé
Adama father see
‘Adama saw the father’

Prosodic boundary downstep

- An M word in the X position following an M verb is downstepped (14a)
- No downstep with other identical tones (14b)

(14) a. sú ádámá fī ˈkūr rɔ̌
father Adama insult village in
'Father insulted Adama in the village'

b. ádámá bú ɟá sú tjā
Adama leopard watch father place
'Adama watched the leopard at father's house'

Prosodic boundary downstep

- M postpositions are downstepped following M nouns (15a)
- No downstep with other identical tones (15b)

(15)

a.	*nɔ̄ŋ ˈsɛ̄*	‘with the person’
	nɔ̄ŋ ˈsɔ̄ŋ	‘under the person’
	nɔ̄ŋ ˈmɛ̄	‘near the person’
b.	*sú rɛ́*	‘to the father’
	lè ɟàkə̂n	‘in front of the father’

Prosodic boundary downstep

The second M noun in a possessive construction is downstepped

- Possessive constructions are formed by juxtaposing two nouns
  - First is the possessor
  - Second the possessee
- No overt possessive markers

(16)	*sú tjé*	father sorghum	‘father’s sorghum’
	sú ḿpəmpā́r	father child	‘father’s child’
	lè kɔ̀ŋ	uncle buffalo	‘uncle’s buffalo’
	kɛ̄j bû	wife house	‘the wife’s house’

Prosodic boundary downstep

- When both nouns in a possessive construction are M, the second is downstepped

(17)	*nɔ̄ŋ ˈbjɛ̄*	person calabash	‘the person’s calabash’
	nɔ̄ŋ ˈfɛ̄	person stomach	‘the person’s stomach’
	pɛ̄ ˈkɛ̄j	husband wife	‘the husband’s wife’
	pɛ̄ ˈbō	husband eggplant	‘the person’s eggplant’

Prosodic boundary downstep

Downstep occurs in a /M M/ sequence between

- A subject and following object
- A verb and following word in the X position
- A noun and a postposition
- Two nouns in a possessive construction

Prosodic boundary downstep

Downstep occurs in a /M M/ sequence between

- A subject and following object
- A verb and following word in the X position
- A noun and a postposition
- Two nouns in a possessive construction

The downstep appears to occur at the boundary of a NP or VP and the following constituent

Prosodic boundary downstep

- There is no downstep of the second M in /M M/ sequences with
  - A monomorphemic root (18a)
  - A noun and the plural marker *-nɔ̄* (18b)

(18)

a.	*bjɛ̄rī*	‘twist’
	fə̄rī	‘feces’
	mə̄rī	‘nose’
b.	*síŋ̀jān-nɔ̄*	‘frying pans’
	wə̄r-nɔ̄	‘bodies’
	sār-nɔ̄	‘palm tree fruits’

Prosodic boundary downstep

- There is no downstep of the second M in /M M/ sequences with
  - A monomorphemic root (18a)
  - A noun and the plural marker *-nɔ̄* (18b)

(19)

a.	*bjɛ̄rī*	‘twist’
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	wə̄r-nɔ̄	‘bodies’
	sār-nɔ̄	‘palm tree fruits’

No downstep word-internally

- Not at NP boundary

Prosodic boundary downstep

- There is no downstep of the second M in /M M/ sequences with
  - A noun and a following adjective or determiner

(20)

nɔ̄ŋ pər	‘small person’
nɔ̄ŋ rī	‘the person’
nɔ̄ŋ ā	‘this person’
nɔ̄ŋ mɛ̄	‘that person’
nɔ̄ wū	‘those people’

Prosodic boundary downstep

- There is no downstep of the second M in /M M/ sequences with
  - A noun and a following adjective or determiner

(21)

nɔ̄ŋ pər	‘small person’
nɔ̄ŋ rī	‘the person’
nɔ̄ŋ ā	‘this person’
nɔ̄ŋ mɛ̄	‘that person’
nɔ̄ wū	‘those people’

No downstep between a N and adjective or determiner

- Not at NP boundary

Prosodic boundary downstep

- There is no downstep of the second M in /M M/ sequences with
  - A M Aux particle and following object/verb

(22) a. ádámá pɔ̄ ɟɛ̄
Adama IS sweep
'When Adama sweeps…'

b. ádámá pɔ̄ nɔ̄ŋ fī
Adama IS person insult
'When Adama insults the person…'

Prosodic boundary downstep

- There is no downstep of the second M in /M M/ sequences with
  - A M Aux particle and following object/verb

(23) a. ádámá pɔ̄ ɟɛ̄
Adama IS sweep
'When Adama sweeps…'

b. ádámá pɔ̄ nɔ̄ŋ fī
Adama IS person insult
'When Adama insults the person…'

No downstep between a functional element and Following N/V

- Not at NP boundary

Prosodic boundary downstep

- There is no downstep of the second M in /M M/ sequences with
  - An object and following verb

(24) a. sú nɔ̄ŋ fī
father person insult
'The father insulted the person'

b. sú ɲɔ̄ ɲɔ̄ŋ
father xylophone sell
'Father sold the xylophone'

Prosodic boundary downstep

- There is no downstep of the second M in /M M/ sequences with
  - An object and following verb

(25) a. sú nɔ̄ŋ fī
father person insult
'The father insulted the person'

b. sú ɲɔ̄ ɲɔ̄ŋ
father xylophone sell
'Father sold the xylophone'

No downstep at NP phrase boundary

- This effect is something other than a marker of syntactic phrase boundaries

Prosodic boundary downstep

This downstep is attributable to prosodic phrasing

- If a M is positioned at the right edge of a phonological phrase, a following tone is downstepped
- Most NP and the VP constitute phonological phrases

Prosodic boundary downstep

There is no downstep of a M verb following a M object because the O and V are parsed into a single phonological phrase

- There is L tone spreading restricted to the O and V

Prosodic boundary downstep

- When the final tone of the object is L, it spreads onto the verb, resulting in
  - H verbs → LH
  - HL verbs → L
  - Verbs of other tones are unaffected

(26) a. With *wé* 'see'

ádámá kɔ̀ŋ wě
Adama buffalo see

'Adama saw the buffalo'

b. With *ɟâ* 'search'

ádámá kɔ̀ŋ ɟà
Adama buffalo search

'Adama looked for the buffalo'

Prosodic boundary downstep

- There is no tone spreading elsewhere, e.g., between
  - The subject and object (27a)
  - A noun and a postposition (27b)
  - Two nouns in a possessive construction (27c)

(27) a. kɔ̀ŋ sú wé
buffalo father see
'The buffalo saw the father'

b. lè rɛ́
uncle to
'to uncle'

c. lè sú
uncle father
'Uncle's father'

Prosodic boundary downstep

- The object NP and verb are tightly coupled prosodically, acting as a single phonological phrase
  - Seen in several other languages, e.g.,
    - Kimatuumbi (Odden 1987)
    - Chitumbuka (Downing 2006)
    - Chichewa (Downing & Mtenje 2011)
    - Niuean (Clemens 2019)

Prosodic boundary downstep

To summarize the prosodic boundary downstep:

- M positioned at the right edge of the phonological phrase cause following tones to be downstepped
- NP and VPs constitute phonological phrases
  - Except the VP-internal NP, which is parsed into the same phonological phrase as the VP
- Downstep indicates the edges of prosodic phrases

(28) (kɛ̄j) (ˈnɔ̄ŋ fī) ((ˈkūr) rǒ)
wife person insult village in
‘The wife insulted the person in the village’

Prosodic boundary downstep

A note on the prosodic boundary downstep:

- All examples shown were /M M/ sequences
- /M H/ sequences also trigger this downstep, but this is neutralized with automatic downstep
- The boundary downstep targeting H tones is relevant for double downstep

Absent preverbal (non-subject) argument marking

Absent preverbal argument marking (APVA)

- There is grammatical tone marking the absence of an object or oblique argument immediately before the verb

Absent preverbal argument marking (APVA)

- At first glance, APVA marking looks like intransitive marking
  - The H verb *ɟá* ‘watch’ is H in the transitive clause in (29a)
  - the H verb *pwó* ‘come’ is LH in the intransitive clauses in (29b–c)

(29) a. ádámá búr **ɟá**
Adama bread watch
‘Adama watched the bread’

b. ádámá **pwǒ**
Adama come.APVA
‘Adama came’

c. ádámá á **pwǒ**
Adama PST come.APVA
‘Adama had come’

Absent preverbal argument marking (APVA)

- However, this does not reflect intransitive marking with
  1. Elided objects
  2. Preposed oblique arguments
  3. Auxiliary verbs

Absent preverbal argument marking (APVA)

- When a salient discourse antecedent is present, the object can be elided
- When elided, the verb is marked for APVA

(30) a. ádámá búr ɟá
Adama bread watch
'Adama watched the bread'

Absent preverbal argument marking (APVA)

- When a salient discourse antecedent is present, the object can be elided
- When elided, the verb is marked for APVA

(31) a. ádámá búr ɟá
Adama bread watch
'Adama watched the bread'

b. Context: 'Did Adama see the bread?
ǰ ádámá Ø **ɟǎ**
yes Adama Ø watch.APVA
'Yes, Adama saw [the bread]'

Absent preverbal argument marking (APVA)

- Oblique arguments governed by *sɛ̄* ‘with’ can be preposed before the object
  - (32a) reflects the default SAuxOVX word order

(32) a. ádámá álímátā kɔ̰ **kò** **sɛ̄**
Adama Alimata give meat with
‘Adama gave Alimata meat’

b. ádámá **kò** **sɛ̄** álímátā kɔ̰
Adama meat with Alimata give
‘Adama gave Alimata meat’

Absent preverbal argument marking (APVA)

- Ditransitive ‘give’ constructions can have elided objects
  - When the oblique argument is postverbal (33a), there is APVA marking
  - When preverbal (33b), there is no APVA marking
- These clauses have the same argument structure, but differential APVA marking

(33) a. ádámá **kǯ** **kò** **sɛ̄**
Adama give.APVA meat with
‘Adama gave meat’

b. ádámá **kò** **sɛ̄** **kʒ́**
Adama meat with give
‘Adama gave meat’

Absent preverbal argument marking (APVA)

- There are a set of auxiliary verbs that occur before the object
- They are targeted by APVA marking, even in transitive clauses—there is no object before them

(34) a. ádámá **pwǒ** búr ɟá
Adama come.APVA bread watch
'Adama came to watch the bread'

b. ádámá ká **ˈpə́** ǹ=búr ɟá
Adama NEG PROG.APVA IPFV=bread watch
'Adama isn't watching the bread'

Absent preverbal argument marking (APVA)

The realization of the APVA marker varies depending on

- The lexical tone of the target verb
- The TAMP markers present before the verb
- The lexical properties of the verb

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Phonologically, it can

- Result in a contour tone
- Trigger downstep
- Go unrealized

Absent preverbal argument marking (APVA)

In basic clauses,

- Verbs with initial H tones are targeted, with the effects in (35)
- M and L verbs are unaffected

(35)

H	→	LH
HM	→	LHM
HL	→	L
M	→	M
L	→	L

Absent preverbal argument marking (APVA)

- Following most Aux markers
  - H verbs are downstepped, instead of being realized as LH
- IPFV marker is toneless in APVA contexts

(36) a. sú kə́ **ꜜbwɛ́**
father NEG cough.APVA
'Father didn't cough'

b. sú n=**ꜜbwɛ́**
father IPFV.APVA=cough.APVA
'Father is going to cough'

Absent preverbal argument marking (APVA)

- Following most Aux markers
  - Verbs of other tones go unmarked

(37) a. sú kə́ ɟɛ̄
father NEG sweep
'Father didn't sweep'

b. sú kə́ kō
father NEG walk
'Father didn't walk'

Absent preverbal argument marking (APVA)

- The copula *pé* and the auxiliary verb *pə́* PROG are always downstepped—they never are realized with a rising tone

(38) a. sú ˈ**pé**
father COP.APVA
'Father is there'

b. sú ˈ**pə́** ǹ=búr ɟá
father PROG.APVA IPFV=bread watch
'Father is watching the bread'

Absent preverbal argument marking (APVA)

- Summary of APVA marking:

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  - When realized, the floating L results in a contour tone on the verb or downstep
  - Its realization depends on
    - The lexical tone of the verb—it must begin with a H tone
    - The presence of certain TAMP markers
    - The lexical properties of the verb—its effects are different for the copula and progressive auxiliary verb

Absent preverbal argument marking (APVA)

- Northern Toussian is not the only language with APVA-like marking, where the verb is marked when there is no object in the typical object position
  - The Senoufo languages (Carlson 1994, Dombrowsky-Hahn 2015)
  - Asante Twi (Kandybowicz 2015)

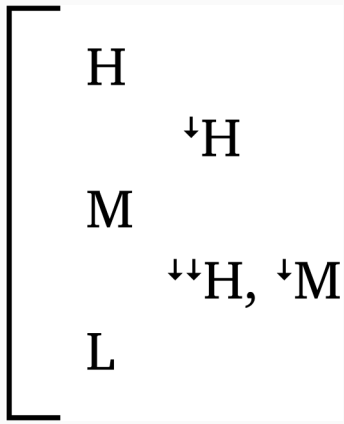
Double Downstep

Double downstep

- We've seen two constructions that trigger non-automatic downstep
  - The prosodic boundary downstep
  - APVA marking
- When both effects target an H verb, the verb is doubly downstepped
  - Its pitch is lowered more than is typical for a single instance of downstep

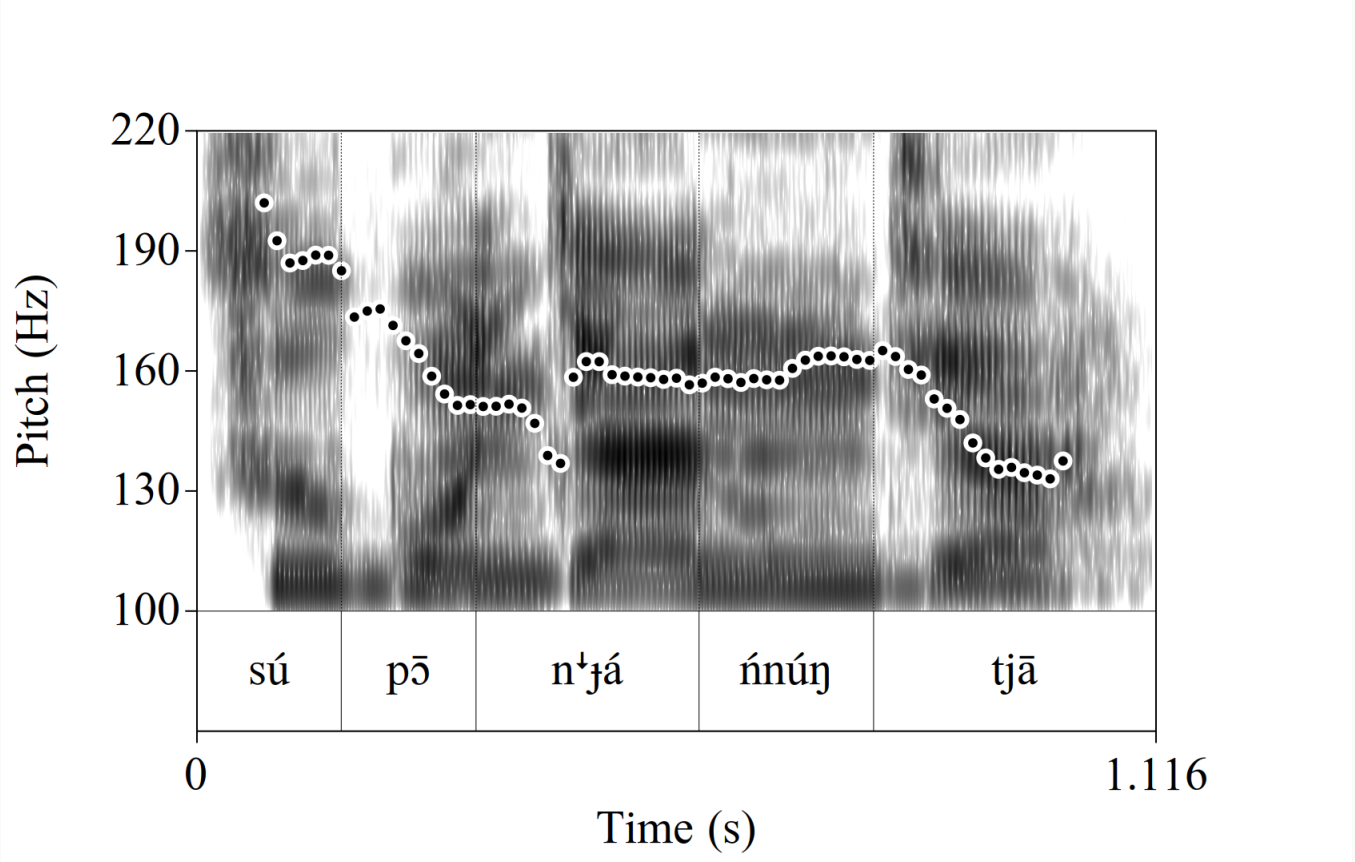
Double downstep

- A singly downstepped H has a higher pitch than a M
- A doubly downstepped H is lower than a preceding M



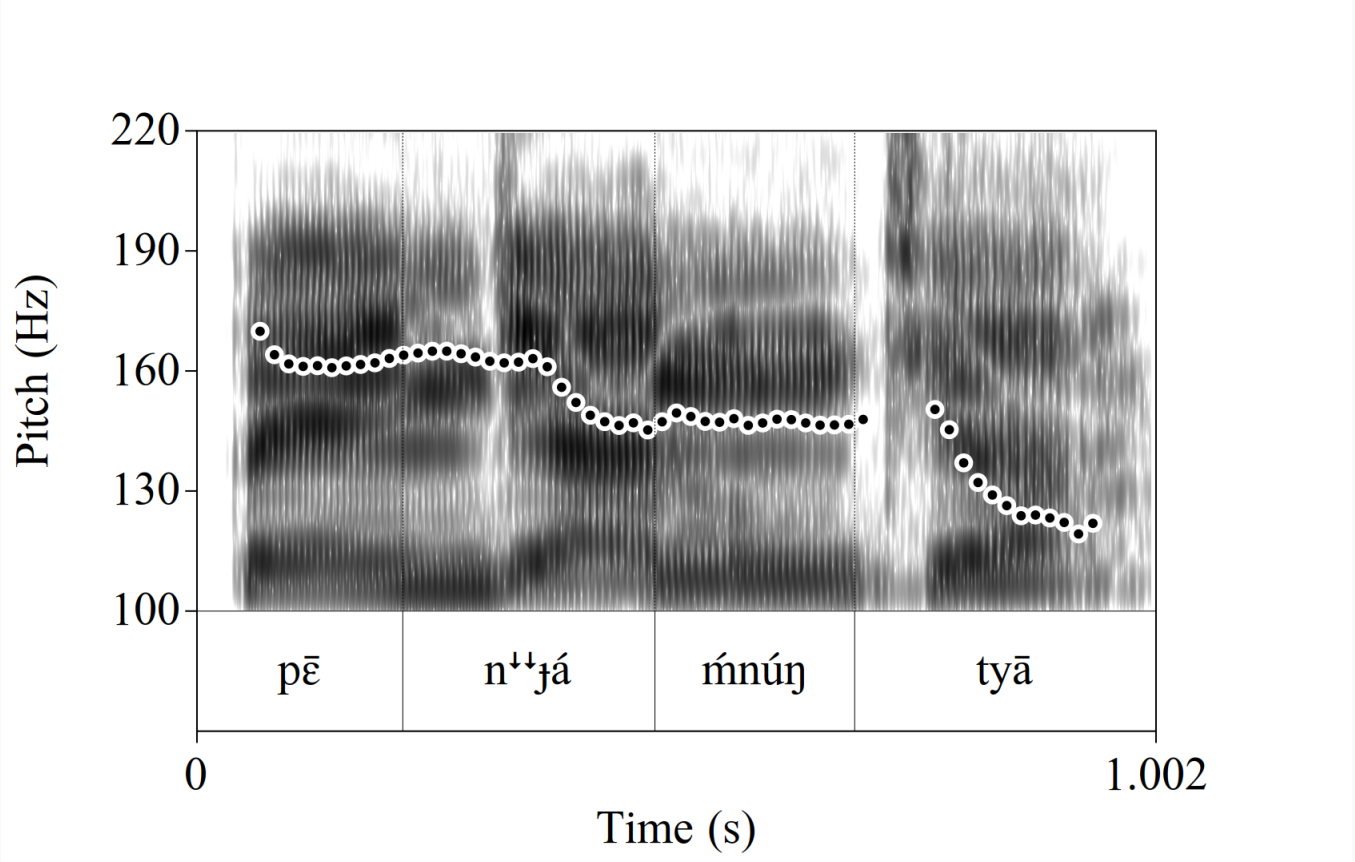
Double downstep

(39) sú pɔ̄ n=ˈɟá ḿ=núŋ tjā
father IS IPFV.APVA=watch.APVA 1SG=mother place
‘When father is going to watch at my mother’s house’



Double downstep

(40) pɛ̄ n=ˡˡ**ɟá** ḿ=núŋ tjā
husband IPFV.APVA=watch.APVA 1SG=mother place
'The husband watched at my mother's house'



Double downstep

- Double downstep is exceedingly rarely attested, noted in just seven languages
  - Three Eastern Grassfields languages: Medʉmba, Yemba, and Bangante (Voorhoeve 1971, Hyman & Tadadjeu 1976)
  - Two Nilotic languages: Acooli and Kumam (Hieda 2010, 2011)
  - Two Oceanic languages: Drubea and Numèè (Lionnet in press)

Double downstep

For a register feature analysis of Northern Toussian double downstep, see Struthers-Young (2025)

In it, I

- Show that the mechanism that causes NT double downstep is unique

Double downstep

For a register feature analysis of Northern Toussian double downstep, see Struthers-Young (2025)

In it, I

- Show that the mechanism that causes NT double downstep is unique
- Analyze the phenomenon with a novel subtonal featural model of tonal representation

Conclusion

Conclusion

- We've seen two tonal phenomena that interact with the grammatical structure of the language
  - Prosodic boundary downstep
  - Absent preverbal argument marking

Conclusion

- These processes are dependent on a number of other aspects of the grammar
  - Prosodic boundary downstep
    - NP and VP structure
    - Word order
  - Absent preverbal argument marking
    - TAMP marking
    - The lexical properties of the target verbs
    - The word order of the clause
    - The position of specific types of arguments

Conclusion

- The downstep caused by these effects are cumulative, resulting in double downstep, an exceedingly rarely attested phenomenon

Ánítyɛ́ bê´!

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