

Poster and references

Register features and cumulativity: the representation of double downstep in Northern Toussian Anthony Struthers-Young - University of California San Diego

astruthe@ucsd.edu





Downstep in Northern Toussian

Downstep lowers the pitch of all subsequent tones in an utterance. Two types of downstep:

Automatic downstep: triggered by the linked sequence L H
 Non-automatic downstep: downstep caused by other factors.
 Northern Toussian (Niger Congo, potentially Mabia; Burkina Faso) has three tones with two sources of non-automatic downstep:

- M at the right edge of phonological phrases causes following tones to be downstepped:
- (1) (pē) ('nōŋ fi) ('kēj ré) husband person insult wife at
 'The husband insulted the person at the wife's house'
- A floating L marking the absence of a preverbal non-subject argument that downsteps H verbs in certain TAM contexts:

(2)	a.	sú	n¹já n − ©ié	b.	sú	¹pé ©pó
		su fathe	$\Pi = \bigcirc_{fa}$		su fathe	©pe r cop apva
'Eather is going to watch'				'Fath	er is there'	
Double downstep occurs when both processes target the same tone:						

(3)	$\begin{bmatrix} -\\ p\bar{\epsilon}\\ (p\bar{\epsilon})\\ husband \end{bmatrix}$	n ⁺⁺ já (n= [©] já)	— núŋ (núŋ mothor	 tjā tjā)		The doul surfa pitch	H verb j á is bly downstepped acing at a lower h than M pē	,
	'The hus	band is going t	o watch	at my mo	ther's hous	e'		
⁴ H and ⁴⁴ H are phonetically distinct from M; ⁴ M is distinct from L • ⁴ H and ⁴⁴ H are not neutralized with M						(4)	H H M	
⁺H and • The	l ⁺⁺H beł y do not	ave like H trigger the	, not M e dowr	I. 1step in	ı (1)		⁺⁺ H, ⁺ M L	

Modeling double downstep

Aims of a model:

- 1) Provide a simple mechanism for downstep
- 2) Give each tonal category a distinct and unique representation
- 3) Represent ⁴H or ⁴⁴H more similarly to H than to M or L



Tonal primitives struggle with complex registral effects (Hyman 1985; Snider 1990, 2020, Lionnet 2022, in press).

- Register Tier Theory addresses this problem (Snider 1990, 2020). • Tones are comprised of two features:
- register features that modify the pitch range (register)
 tonal features that situate the tone within the register.
- These are linked by autosegmental lines to the tonal root node (TRN), which is linked to the tone bearing unit (TBU)



• Downstep occurs when a l register feature associates with a following tone

• This delinks the register feature of the second tone:



At most one register feature can be associated with a TRN
Downstepped High tones are neutralized with Mid tones.

Applying RTT to Northern Toussian

- High and Low are identical to (5)
- \bullet Mid tones are $\rm M_{1},$ as they trigger registral effects like automatic and non-automatic downstep
- How to differentiate Mid and 'High?
- How to represent "High?

Modeling Northern Toussian with RTT

1) Does it provide a simple mechanism	1
for downstep?	•
2) Does it give each tonal category a distinct	\sim
and unique representation?	\sim
3) Does it represent 'H or ''H more similarly	~
to H than M or L?	X

RTT + register feature stacking

I adopt the basic representations of RTT, with crucial differences:

- Register features can stack onto a TRN (see Lionnet in press)
- Downstep is a derived effect triggered for each extra l register feature beyond the lexically specified features - Similar to particle features (Schane 1984) or [open] features
 - (Clements 1991)



The second tone has the features {H, h, l}, realized as a downstepped High because it has an extra l beyond the {H, h} of a High

Double downstep in Northern Toussian caused by:1) association of the l register feature of the floating Low tone2) association of the l register feature of the Mid tone

(8)	(pē) husban 'The hu	([©] pé) d COP.APVA usband is the	$\rightarrow p\bar{\varepsilon}^{++}p\dot{\epsilon}$				
(9)	Lexic	al tones	l asso	ciation	Mid l sprea	iding	Output
	$\begin{array}{c} 1\\ H\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$	l h H∕/ − pe High	$ \begin{array}{c} & \\ & H \\ & \\ & \\ & \\ & \\ & \\ & \\ & \\ &$	l h ∖H ∘ pe	$ \longrightarrow \begin{matrix} 1 & 1 \\ \\ H \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$	h H · · ·	pē ⁺⁺pé

The TBU of $p\acute{e}$ has the features {H, h, l, l}, resulting in double downstep due to the two extra l register features.

How does this stack up?

			^			
-	Tonal catego + register	ories under RTT feature stacking	1) Does it provide a simple mechanism for downstep?			
(10)	Realization H +H ++H	Featural representation {H, h} {H, h, l} {H, h, l, l}	2) Does it give each tonal category a distinct and unique represeitation?	~		
	M 'M L	{H, l} {H, l, l} {L, l}	3) Does it represent ⁴ H or ⁴⁴ H more similarly to H than M or L?	~		

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Anthony Struthers-Young - University of California San Diego astruthe@ucsd.edu AMP 2024

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