

Floating L tones in Kikuyu: Domain-sensitivity and Tonal Interactions

Introduction This study provides a prosodic account for downstep in Kikuyu (Bantu E51) within the syntax-phonology interface. The main claim is that downstep (\downarrow) appears at the right edge of a phonological-phrase (ϕ). Interestingly, the positioning of downstep is in addition to ϕ also determined by tonal surroundings: Another proposed constraint ($*H\#^{\downarrow}L$) forces it to move into the next ϕ resulting in an opaque output. To account for this, a Stratal OT analysis is proposed where the cycles go beyond the conventional stem - word - phrase cycle (c.f. Kiparsky 2000, Bermúdez-Otero 2011). The analysis is based on new data recorded in Berlin (2014).

ϕ and downstep In the syntax-phonology interface, a phonological phrase corresponds to a syntactic phrase (c.f. Selkirk 1986, 1995, Nespor & Vogel 1986, Truckenbrodt 1999, among many others). Kikuyu attests two floating L tones: a lexical floating L tone and a featural floating L tone which appears in assertions. The two \textcircled{L} s trigger downstep on both H and L tones. Data show that the lexical \textcircled{L} only triggers downstep if the word it forms part of is positioned at the right edge of ϕ . ϕ -medial (e.g. when a modifier follows the noun), it is simply deleted and no downstep appears (1-a). Contrastingly, the other \textcircled{L} appears with verbs of assertion and triggers downstep at the right edge of ϕ . It does not appear in other speech acts such as imperative sentences, polarity questions or in embedded clauses (c.f. Clements 1984). In (1-b), the verb and the object, consisting of a noun and a modifier (*mò-rèmi mò-rìtò*), form one ϕ . A ϕ -boundary is inserted after the maximal projection NP and in this position, \textcircled{L} triggers downstep lowering the L-initial syllable of the adverb. The proposed constraint for (1-a) and (1-b) is ALIGN(DS,R, P,R): Align Downstep(DS) with the right edge of a phonological phrase. If \textcircled{L} appears in the tone sequence; /H# \textcircled{L} L/, no downstep is triggered on the L tone regardless of it being positioned at the right edge of ϕ . Instead, \textcircled{L} will move to the right deleting the L tones it crosses. It then triggers downstep on the first H tone it encounters. If no H tone follows, \textcircled{L} will simply be positioned in utterance-end position. Unbounded HTS then applies to the L tones which have been deleted (c.f. Philippson 1992). The sequence /H \textcircled{L} ϕ LLH/ will surface as [H] ϕ HH \downarrow H]. If the floating L tone does not encounter any H tone, it will move until clause-final position and remain there without lowering any tones. The tone sequence /H \textcircled{L} ϕ LLLL/ will surface as [H] ϕ HHHH \downarrow] (1-c). The suggested constraint for this tone pattern is $*H\#^{\downarrow}L$, a constraint motivated by articulatory ease which serves to avoid a double pitch drop. Crucially, unbounded HTS in Kikuyu only applies in correlation with a floating L tone.

- (1) a. (*ɲòmbè y-áké hó-rèrì*) ϕ (*èrè ðéinè oá ɲómbà*) ϕ /*ɲòmbè* \textcircled{L} *y-áké hò-rèrì*/
 9.cattle 9-POSS gentle COP.LOC inside inside CONN house
 ‘His gentle cattle is inside the house’
- b. (*nd-ò:nìré mò-rèmi mò-rìtò*) ϕ \downarrow (*rò:síně*) ϕ /*mo-rèmi* \textcircled{L} *mo-rìtò*/
 SM1P.SG-see-RC.PST 1-farmer 1-ugly 11-morning
 ‘I saw the ugly farmer this morning.’
- c. (*á-hè-ìr-é moànyáhiṅá*) ϕ (*βíriβíri*) ϕ \downarrow /*moànyáhiṅá* \textcircled{L} *βiriβiri*/
 SM3-give-PRF-FV 1-weakling 10.chillies
 ‘He gave the weakling chillies’ (Clements and Ford 1981: 315)

Problem The different positions of the assertive downstep in (1-b) and (1-c) pose a challenge to Classic OT: In an assertive clause with the configuration [H] ϕ L], the constraint $*H\#^{\downarrow}L$ will force \textcircled{L} to trigger downstep in a position that deviates from what ALIGN(DS,RP,R) predicts. Thus, $*H\#^{\downarrow}L$ must be ranked higher than ALIGN(DS,R;P,R). If this is however the case, why is \textcircled{L} not simply inserted directly in a position which doesn’t violate $*H\#^{\downarrow}L$ to begin with? The tone pattern in (1-c) indicates an intermediate step in the derivation where the assertive \textcircled{L} is first inserted according to ALIGN(DS,R;P,R) and then subject to $*H\#^{\downarrow}L$, moving \textcircled{L} to another position.

Proposal First, the asymmetry between the lexical \textcircled{L} and the assertive \textcircled{L} can be accounted for by a high ranking of REALIZE MORPHEME, a constraint which demands realization of a morpheme on the surface (Kurusu 2001): Deletion of the lexical \textcircled{L} is tolerated whenever it is ϕ -medial in order to satisfy ALIGN(DS,R;P,R) because not *all* exponents of the morpheme are deleted. On the contrary, the assertive \textcircled{L} is a feature which cannot be deleted as this specific morpheme would not be exposed. The assertive \textcircled{L} is positioned according to ALIGN(DS,R;P,R). If this position has the tone sequence; [H] ϕ L], \textcircled{L} will be forced into the following ϕ by the constraint $*H\#^{\downarrow}L$ as shown in (1-c). The data

can be captured with a Stratal OT analysis where the first cycle is the phrase which maps with ϕ . The faithfulness constraint LIN(EARITY) is used which demands preservation of underlying linear order in the output. LIN is ranked low in cycle 1 but will be ranked higher in cycle 2. It applies to tones rather to segments and assigns a violation mark to every instance of tone metathesis. The linear order of \textcircled{L} and the surrounding tones in the input needs to be preserved in the output (where \textcircled{L} is realized as [\downarrow]). The constraint ranking for patterns such as (1-b) is in (2).

$$(2) \quad \text{RM} \gg \text{ALIGN}(\text{DS}, \text{R}, \text{P}, \text{R}) \gg \text{LINEARITY} \gg *H\#\downarrow L$$

	[á-hè-ìr-é \textcircled{L} moànyáhìná]	RM	A(DS,R;P,R)	LIN	*H# \downarrow L
	he-gave the.weakling				
a.	(á-hè-ìr-é \downarrow moànyáhìná) ϕ		*!		*
b.	(á-hè-ìr-é moànyáhìná) ϕ	*!			
☞c.	(á-hè-ìr-é moànyáhìná) $\phi\downarrow$			****	*

Cycle 1: OT ranking for the p-phrase (he-gave weakling) ϕ

In cycle 1, candidate (b) is the first one to be ruled out because it violates RM as assertive \textcircled{L} has been deleted. In candidate (a), \textcircled{L} triggers downstep in the position which corresponds to the input. This satisfies the lower ranked LIN constraint but fatally violates ALIGN(DS, R; P, R) because it is ϕ -medial. (c) is the remaining winner as the floating L tone triggers downstep at the right edge of ϕ satisfying the two highest ranked constraints RM and ALIGN(DS, R; P, R). LIN assigns four violation marks as the order of the tones of four syllables deviate from the input: \textcircled{L} LHLH \rightarrow LHLH \downarrow . The output of cycle 1, candidate (c), is now the input of cycle 2. In this cycle, another p-phrase has been added to form a full clause and there is a re-ranking of the constraints: *H# \downarrow L is now undominated and LIN is higher ranked than A(DS,R; P,R).

	[á-hè-ìr-é moànyáhìná \downarrow βìrìβìrì]	*H# \downarrow L	RM	LIN	A(DS,R; P,R)
	he-gave the.weakling chillies				
a.	(á-hè-ìr-é \downarrow moànyáhìná) ϕ (βìrìβìrì) ϕ	*!		*	*
b.	(á-hè-ìr-é moànyáhìná) $\phi\downarrow$ (βìrìβìrì) ϕ	*!			
☞c.	(á-hè-ìr-é moànyáhìná) ϕ (βìrìβìrì) $\phi\downarrow$				
d.	(á-hè-ìr-é moànyáhìná) ϕ (βìrìβìrì) $\phi\downarrow$			****!	
e.	(á-hè-ìr-é moànyáhìná) ϕ (βìrìβìrì) ϕ		*!		

Cycle 2: OT constraints for the clause (he-gave the weakling) ϕ (chillies) ϕ

In the input of cycle 2, downstep is positioned at the right edge of ϕ in the sequence H# \downarrow L. Candidate (b) has this exact output which violates the undominated constraint *H# \downarrow L. Thus, (b) is ruled out. Candidate (e) is next rejected as \textcircled{L} has been deleted violating RM. LIN is now high ranked and will regulate the I/O-order of downstep and the surrounding tones. Candidate (a) violates both H# \downarrow L and LIN and is ruled out. Also, (a) violates ALIGN(DS, R; P, R) because it is not right-aligned with a p-phrase. In both candidate (d) and (c), downstep has moved to a clause-final position which neither violate *H# \downarrow L nor ALIGN(DS, R; P, R) as it is aligned with a ϕ . However, there is a crucial difference between them regarding the I/O order of the tones: In (d), LIN is violated because the order of the tones deviate from the input. In (c) on the other hand, the tones which downstep has shifted across are now H instead of L. The determining point is that LIN is not violated by (c) when downstep shifts across βìrìβìrì iff these tones are different from the input. That is, in the output the tones are now H and downstep only change order with tones which are not in the input. This can be interpreted as a sort of repair strategy which doesn't violate *H# \downarrow L nor LIN.

In sum, floating L tones in Kikuyu demonstrate the complexity of tone in general and how distinct tonal nature (lexical or featural) is reflected in the different types of interaction \textcircled{L} attests with syntax and the tone rule HTS. A Stratal OT analysis has been proposed which can account for these outputs.

Selected references. *Clements, G. N. 1984. Principles of tone assignment in Kikuyu. In G. N. Clements and J. Goldsmith (Eds.), *Autosegmental studies in Bantu*, Dordrecht: Foris. *Philippon, G. (1992). *Tons et accent dans les langues bantu d'Afrique Orientale: étude comparative typologique et diachronique*. Ph.D. thesis, Paris: Université René Descartes. * Odden, D. & R. R Roberts-Kohno (1999). Constraints on Super-Low tone in Kikamba. In R. Kager and W. Zonnenveld (Eds.), *Phrasal Phonology*, Nijmegen University Press.