Cyclic Optimization of Floating L Tones in Kikuyu *

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1. Introduction

This study discusses the puzzling pattern of downstep ($^{\downarrow}$) in Kikuyu (Bantu, E51). Kikuyu is a tone language with a /H L Ø/ tonal distinction which attests underlying floating L tones of lexical and phrasal nature. These two tones are domain-sensitive and their input-output derivation gives evidence for cyclicity. The domain of the floating tones is the p(honological)-phrase and downstep appears preferably at the right edge of a p-phrase. Interestingly, the positioning of downstep is also determined by surrounding tones as the sequence H$^{\downarrow}$L is banned. The puzzling part is that the phrasal floating L tone moves away from its underlying position towards its preferred realization site of a p-phrase edge and this happens even in contexts where the floating L tone can not be realized in this position due to markedness reasons. It can therefore end up triggering downstep in a p-phrase medial position which deviates from its underlying position. This pattern poses a serious challenge to parallel Optimality Theory and argues for a serial derivation. The proposal here is a Stratal OT analysis with two strata above the word level. The first stratum derives the positioning of the floating L tones according to the p-phrase edge. The second stratum derives an interaction between the floating L tones and High Tone Spreading (HTS). The analysis predicts that L tone deletion followed by unbounded HTS works as a repair mechanism which allows the floating L tone to move without undergoing tonal metathesis. The analysis is based on new data recorded in Berlin in 2014.

2. Domain of downstep

Firstly, the inspiration for this work comes from the excellent studies by Clements & Ford (1981) and Clements (1984) who propose a ruled-based analysis of downstep in Kikuyu. Secondly, this paper builds on Gjersøe (2016) who proposes an analysis of downstep in

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Kikuyu within the end-based approach of the syntax-phonology interface (cf. Selkirk 1995, Truckenbrodt 1999, among others). The proposed domain of downstep in Kikuyu is the p-phrase (ϕ) which in the prosodic hierarchy corresponds to the maximal phrase (XP). The p-phrase in Kikuyu is determined by the ranking ALIGN(XP,R;ϕ,R) << *P-PHRASE.[1,2] This ranking predicts that every maximal phrase of a lexical category triggers a p-phrase boundary. More concretely, a noun and an adjacent modifier, and a verb and a following object form one p-phrase, while a subject, a secondary object or an adjunct which follows a primary object form a separate p-phrase. In coordination, the conjunction triggers a p-phrase boundary.

Downstep is triggered by a floating L tone (Ⓛ) which can either be lexical or phrasal. It can trigger downstep on both H and L tones and the three following configurations are attested: (i) H)$_\phi$ˡH; (ii) L)$_\phi$ˡH; (iii) L)$_\phi$ˡL. The lexical floating L tone appears final in certain nouns as in *mondò* (1). P-phrase-medial it gets deleted as in (1) where an adjective follows the noun. Downstep is triggered when Ⓛ is positioned at the right-edge of a p-phrase. This is shown in (2) where Ⓛ in *mondò* triggers downstep on the initial L-toned syllable of the verb. Note that in (2), binary HTS applies from the verb onto the object. It is assumed that H, L and Ø tones are underlying specified in Kikuyu and underlying toneless syllables like the noun class prefix receive a default L on the surface (cf. Gjersøe 2015).

(1) /mondòⓁ mokòrò/[3]
(mò-ndò mò-kòrò)$_\phi$
1-person 1-old
'an old person'

(2) /mondòⓁ àhɛìrɛ́Ⓛ βìrìβìrì/
(mò-ndò)$_\phi$ (ˡà-hɛ̀-ìrɛ́ βírìβìrì)$_\phi$
1-person SM-give-PVF.FV 10.chillies
'A person gave chillies.'

The example in (2) also shows another floating L tone marked in bold which follows the verb underlyingly. This is the phrasal Ⓛ which appears final in verbs of assertions (cf. Clements (1984), Gjersøe (2015, 2016)). Just as the lexical Ⓛ, the phrasal Ⓛ can trigger downstep on a syllable to its right. The data in (3) shows that p-phrase-medial, Ⓛ does not trigger downstep. Instead, downstep appears at the right edge of the p-phrase. In (3a), downstep appears on the secondary object *βìrìβìrì*. In (3b), the verb and the modified nominal object form one p-phrase. Downstep appears on the L-initial syllable of the adverb *roːsíːnĕ*. In (3c), the object is a coordination where the first noun forms a p-phrase with the verb while the conjunction *nà* triggers a new p-phrase boundary. Downstep appears on *nà*.

(3) a. /áhɛìrɛ́Ⓛ mwànèkìⓁ βìrìβìrì/
(á-hɛ̀-ìrɛ́ mwánèkì)$_\phi$ ˡ(βìrìβìrì)$_\phi$
SM-give-PFV.FV Mwanĩki 10.chillies
'He gave Mwanĩki chillies.' (Clements & Ford 1981, 315)

[1] A high ranking of ALIGN(XP,R) for Kikuyu downstep has also been suggested by Selkirk (2000).

[2] The constraint *P-PHRASE is taken from Truckenbrodt (1999) and bans the formation of p-phrases.

[3] All examples without a reference are from own recordings. The underlying tones (H: V́, L: V̀ or toneless V) are shown in the first line of the glossed example and surface tones are shown in the second line. The syllable is the TBU. Abbreviations for the glossings follow the Leipzig Glossing rules. Exception are: FV – final vowel, NPST – near past, and SM – subject marker.

b. /ndɔːnìrɛ́Ⓛ morèmìⓁ morìtòⓁ roːsíːnĕ/
(nd-ɔ̀ːn-ìrɛ́ mó-rèmì mò-rìtò)$_\phi$ ($^{\downarrow}$rò:-síːnè)$_\phi$
SM-see-PFV.FV 1-farmer 1-ugly 11-morning
'I saw the ugly farmer this morning.'

c. /ndèràːrɔ́rìrɛ̀Ⓛ mwànèkìⓁ nà nʒòɣónáⓁ/
(ndè-ràː-rɔ́r-ìrɛ̀ mwànèkì)$_\phi$ ($^{\downarrow}$nà nʒòɣóná)$_\phi$
SM-NPST-watch-PFV.FV Mwanĩki and Njũguna
'I watched Mwanekĩ and Njũguna.'

If the verb is the final item in a p-phrase, it will trigger downstep on the following word. This is shown in (4) where Ⓛ triggers downstep on the subordinating conjunction *àtè*.

(4) /mwànèkìⓁ ɛ̀ːsíːriàⓁ àtè né ndɔ́ːnìrɛ́Ⓛ moɣɛ̀ràniá ðeínè wá ɲòmbă/
(mwànèkì)$_\phi$ ($^{\downarrow}$ɛ̀ː-síːrì-à)$_\phi$ (**$^{\downarrow}$àtè** né nd-ɔ́ːn-ìrɛ́ mó-ɣɛ̀ràníá)$_\phi$ ($^{\downarrow}$ðéínè wá ɲómbà)$_\phi$
Mwanĩki SM-think-FV that FM SM-see-PFV.FV 1-examiner inside of 9.house
'Mwanĩki thinks that I saw the examiner inside the house.'
(Clements & Ford 1981, 327)

The example in (4) also shows an important point regarding the source of the downstep. In (3), it is unclear whether it is the lexical floating tone or the phrasal one which triggers downstep. This is disambiguated in (4). The source of the downstep appearing on *ðeínè* in the embedded clause can only be the phrasal Ⓛ because there is no adjacent lexical Ⓛ that could trigger downstep in that position. This indicates that the phrasal Ⓛ shifts from the underlying position to the surface position where it triggers downstep. Evidence for the noun not having an underlying lexical Ⓛ is shown independently in (5) where *moɣɛ̀ràniá* is the final word in the p-phrase. Downstep is *not* triggered on the H-toned copula *né*. If a lexical floating L tone were present, it would trigger downstep as it does in (6).

(5) /moɣɛ̀ràniá néⓁ mwɛ̀ɣá/
(mò-ɣɛ̀ràníá)$_\phi$ (**né** mw-ɛ̀ɣá)$_\phi$
1-examiner COP 2-good
'The examiner is good.'

(6) /ɲʒòɣónáⓁ néⓁ mwɛ̀ɣá/
(ɲʒòɣóná)$_\phi$ (**$^{\downarrow}$né** mw-ɛ̀ɣá)$_\phi$
Njũgũna COP 2-good
'Njũgũna is good.' (Gjersøe 2016)

Another relevant tone rule is 'Flattening' which lowers an utterance-final H tone (Clements & Ford 1981). This applies to the final rising tones in (3b) and (4). If a floating L tone, however, is utterance-final, it blocks Flattening from applying to H tones or rising tones. This is the case for (3c), (5) and (6). In the two latter examples, the phrasal Ⓛ has shifted to utterance-final position as also seen in (4). In this position, it blocks Flattening.

To summarize this section, lexical and phrasal floating L tones trigger downstep in the configurations (i) H)$_\phi$$^{\downarrow}$H; (ii) L)$_\phi$$^{\downarrow}$H; (iii) L)$_\phi$$^{\downarrow}$L. They have two different strategies for this. While the lexical Ⓛ gets deleted whenever it is p-phrase-medial, the phrasal Ⓛ moves from the underlying position adjacent to the verb, to the right edge of the p-phrase where it triggers downstep.

3. Cyclicity and High Tone Spreading

If a floating L tone appears in the tone sequence /H)$_\phi$ⓁL/ (where 'Ⓛ' can be either the phrasal or lexical tone), no downstep is triggered on the L tone regardless of it being positioned at the right edge of a p-phrase. Instead, the floating L tone will move to the right triggering downstep on the first H tone it encounters. HTS then applies to the L tones in this p-phrase which precedes the now downstepped H tone. This process changes a sequence like /H)$_\phi$ⓁLLH/ to [H)$_\phi$HH$^{\downarrow}$H] as shown in (7). Note that /HⓁØ/ and /HⓁL/ are treated here as the same because it is assumed that toneless syllables receive a default L tone. Downstep is triggered p-phrase-medially on the underlying H-toned syllable *síː* of the adverb *roːsíːnĕ* (7a) and on the H-toned syllable *ɣó* of *nʒòɣóná* (7b). HTS applies on the preceding L-toned syllables. The two examples can be compared with (3b) and (3c) in section 2 where downstep *is* triggered on the right edge of the p-phrase because of the underlying tones being L)$_\phi$ⓁL.

(7) a. /ndɔːnìrɛ́**Ⓛ** ɲʒátáⓁ roːsíːnĕ/
(nd-ɔːn-ìrɛ́ ɲʒátá)$_\phi$ (róː-$^{\downarrow}$síːnè)$_\phi$
SM-see-PFV.FV 9.star 11-morning
'I saw a star this morning.'

b. /ndèràːrɔ́rìrɛ̀**Ⓛ** ŋàŋá nà nʒòɣónáⓁ/
(ndè-ràː-rɔ́r-ìrɛ̀ ŋàŋá)$_\phi$ (ná nʒó$^{\downarrow}$ɣóná)$_\phi$
SM-NPST-watch-PFV.FV Ng'ang'a and Njũguna
'I watched Ng'ang'a and Njũguna.' (Gjersøe 2016)

If no H tone follows, the floating L tone will simply move to utterance-final position and remain floating without lowering any tones. Unbounded HTS then applies to the L tones which precede the downstepped H tone. Evidence of the presence of the floating L tone is that Flattening does not apply. The sequence /HⓁ)$_\phi$ L...L/ surfaces as [H)$_\phi$ H...HⓁ] (8). Crucially, unbounded HTS in Kikuyu only applies in correlation with a floating L tone and it opposes to binary HTS which applies between the verb and the object in (2), (3a), (3b), (4), and also (8). Because L tone is underlyingly specified in Kikuyu, I adopt the analysis of Philippson (1991) where unbounded HTS can apply because underlying L tones have been deleted. Without deletion, only binary HTS applies.

(8) /áhɛìrɛ́**Ⓛ** keɲàɲí βìrìβìrì/
(á-hɛ̀-ìrɛ́ ké-ɲàɲ**í**)$_\phi$ (**βíríβírí**)$_\phi$
SM-give-PFV.FV 7-crocodile 10.chillies
'He/she gave the crocodile chillies.'

The examples in (7) and (8) differ from the examples shown in section 2. In (8), the floating L tone of the verb would be expected to appear on its immediate p-phrase edge. Instead there is evidence of it appearing final in the utterance on the successive p-phrase edge. In (7) the floating L tones fail to appear at a p-phrase edge. The question is then, why does

the phrasal Ⓛ move in the first place towards the H)ϕ L position, if it can not trigger downstep in its preferred position at the p-phrase edge? The fact that they are nevertheless realized in a position different from its underlying one is only predicted in a derivation with an intermediate step where the tone first shifts to the end of its immediate p-phrase. This is shown in (9). The floating L tone moves to the right edge of its immediate p-phrase. In this position, the surrounding tones determine whether it will trigger downstep. In /H)$_\phi$ⓁL/, it will move further to the right in the successive p-phrase to avoid the sequence H$^{\downarrow}$L.

(9) a. (ndè-rà:-rɔ́r-ìrɛ̀ ŋàŋá)$_\phi$ **Ⓛ** nà nʒòɣóná)$_\phi$
SM-NPST-watch-PFV.FV Ng'ang'a and Njũguna

b. (á-hɛ̀-ìrɛ́ ké-ɲàɲ**ɪ́**)$_\phi$ **Ⓛ(βìrìβìrì)**$_\phi$
SM-give-PFV.FV 7-crocodile 10.chillies

Evidence for the source of downstep in (7b) and (8) actually being the **Ⓛ** which has moved rather than an adjacent lexical Ⓛ is shown below. In (10) and (11), the nouns *ŋàŋá* and *keɲàɲí* do not induce downstep on the following word although there is a p-phrase boundary. Thus, they do not have a lexical Ⓛ.

(10) /ŋàŋá nà ɲʒòɣóná Ⓛ/
(ŋàɲ**á**)$_\phi$ (**ná** ɲʒòɣóná)$_\phi$
Ng'ang'a and Njũgũna
'Ng'ang'a and Njũgũna'
(Gjersøe 2016)

(11) /keɲàɲ**ɪ́** keɔ́nírɛ́ **Ⓛ**/
(kè-ɲàɲ**ɪ́**)$_\phi$ (ké-ɔ́n-írɛ́)$_\phi$
7-crocodile SM-see-PFV.FV
'The crocodile saw.'
(Clements & Ford 1981, 321)

The example in (10) also forms a minimal pair with (7b) in terms of binary vs. unbounded HTS. It is concluded that the latter applies whenever there is an underlying floating L tone: /H)$_\phi$ⓁLLL.../ $\rightarrow$ [H)$_\phi$HHH...Ⓛ]. Otherwise, binary HTS applies: /H#LL/ $\rightarrow$ [H#HL].

4. Proposal

The proposed analysis for floating L tones in Kikuyu is a Stratal OT analysis (Bermúdez-Otero 1999, Kiparsky 2000). Following Jones (2014), the strata exceed the canonical three stem - word - phrase levels and are composed by prosodic domains. In Kikuyu, two cyclic evaluations are necessary at the postlexical level. The first stratum is the p-phrase and the second is the i(ntonation)-phrase (ι). Each stratum has a different constraint ranking. The idea is that the p-phrase stratum derives the positioning of the floating L tone which is preferred at the right edge of a p-phrase. In the i-phrase stratum, the marked configuration H$^{\downarrow}$L might be expected at the boundary between two p-phrases. Because this position is impossible, the floating L tone will move into the next p-phrase to the right.

The proposed constraint for the tone pattern in cases like (7) and (8) is *H$^{\downarrow}$L (12). This constraint is based on Gussenhoven (2004) who suggests that HⓁL in Kikuyu is banned. The motivation for this constraint is based on the p-maps of Steriade (2001). Since there is lowering between an adjacent H and L, an additional lowering due to downstep would be

particularly difficult to perceive. The proposed constraint ALIGN(DS,R;P,R) in (13) prefers candidates with downstep at the right edge of a p-phrase. This is a gradient constraint where a violation mark is assigned for every syllable that intervenes between the downstep and a right p-phrase edge. The faithfulness constraint LINEARITY-T (LIN-T) in (14) (based on McCarthy & Prince (1995)) bans tone metathesis. It is gradient and applies for both floating and associated tones. This means that a violation mark occurs whenever (L) undergoes metathesis with other tones. Crucially, if the tones which are crossed by the floating L tone are deleted, LIN-T is not violated because there are no tones to undergo metathesis with. The constraint REALIZE MORPHEME (RM) (Kurisu 2001) demands that distinct morphological forms should differ phonologically. RM will be violated if the phrasal (**L**) gets deleted, because as mentioned in section 2, (**L**) marks assertion. Deletion would therefore result in an assertive verb form having the same phonological form as a non-assertive verb form. The markedness constraint HAVE-TONE assigns a violation mark to toneless syllables on the surface. Finally, the three faithfulness constraints MAX|, MAX-L and MAX-H ban deletion of an association line, and deletion of H and L tones respectively which were in the input. The constraint rankings for both strata are shown in (16) and (17) .

(12) *H$^{\downarrow}$L
Assign a violation mark to the sequence H$^{\downarrow}$L.

(13) ALIGN(DS,R; p-phrase,R)
Align Downstep (DS) with the right edge of a p-phrase.

(14) LINEARITY-T (Akinlabi & Liberman 2006)
Preserve the underlying linear order of tones (i.e. Do not metathesize tones).

(15) HAVE-TONE (McCarthy et al. 2012)
Assign a violation mark for every tone that is not associated with a syllable.

(16) Eval of p-phrase
*H$^{\downarrow}$L<<RM<<HAVE(T)<< MAX-H<< ALIGN(DS,R; P,R)<<MAX|<<LIN-T<<MAX-L

(17) Eval of i-phrase
*H$^{\downarrow}$L<<RM<<HAVE(T)<<LIN-T<<MAX-H<<ALIGN(DS,R; P,R)<<MAX|<<MAX-L

The challenge for a parallel OT approach is that, on the one hand, there is evidence for the phrasal (**L**) moving to the p-phrase edge according to ALIGN(DS,R; P,R); on the other hand, if it moves to the configuration H)$_{\phi}$ L, the constraint *H$^{\downarrow}$L will force (**L**) to trigger downstep in a position that can violate ALIGN(DS,R; P,R). Thus, *H$^{\downarrow}$L must be ranked higher than ALIGN(DS,R; P,R). If this is the case, the crucial question is why (**L**) is not simply placed directly in a position which does not violate *H$^{\downarrow}$L to begin with. The main idea of the analysis is that in the first cycle, the position of the floating L tones is mainly determined by ALIGN(DS,R; P,R). The constraint ranking will generate a winner where the lexical (L) has been deleted if it occurs p-phrase-medially in the underlying form. The phrasal (**L**) can not be deleted because RM is high ranked. Thus, the winner will be the candidate where (**L**) has shifted to the right edge of the p-phrase in order to satisfy ALIGN(DS,R; P,R). This is tone metathesis but because LIN-T is low ranked, it will be the winning pattern. Having the ranking of MAX| <<LIN-T << MAX-T is necessary to generate the correct winner for the

lexical Ⓛ because deletion of associated tones is worse than deletion of a floating L tone. It is assumed that RM does not penalize deletion of the lexical floating L tone because nouns with and without this tone are part of the same morphosyntactic category.

In (18), the input has a phrasal **Ⓛ** positioned p-phrase-medially. If it remains in this position (triggering downstep), ALIGN(DP,R;P,R) is violated (candidate (a)). If it is deleted, the high-ranked constraint RM is violated (candidate (b)). The winner is candidate (e) where the floating L tone has undergone tonal metathesis in order to be a the right edge of the p-phrase. This violates LIN-T but it is low ranked in cycle one so the violation is not fatal. Deleting the H tones to avoid violating LIN-T as in candidate (c) and (d) will not help the outcome because this violates MAX-H and MAX| which are higher ranked than LIN-T. Candidate (c) also violates HAVE-T.

(18) *Cycle 1: Evaluation of the p-phrase (ϕ):* he-saw a.star (7a).

	*H↓L	RM	HAVE-T	MAX-H	A(DS,R; P,R)	MAX|	LIN-T	MAX-L
L LH**Ⓛ** H H (ndɔːnirɛ ɲʒata)$_\phi$								
a. L LH**Ⓛ** H H (ndɔːnirɛ ɲʒata)$_\phi$					*!			
b. L LH H H (ndɔːnirɛ ɲʒata)$_\phi$		*!						*
c. L LH **Ⓛ** (ndɔːnirɛ ɲʒata)$_\phi$			*!*	**		**		
d. L LH **Ⓛ** (ndɔːnirɛ ɲʒa ta)$_\phi$				*!*		**		
☞e. L LH H H**Ⓛ** (ndɔːnirɛ ɲʒata)$_\phi$							**	

In the second cycle, the winner of the first cycle is the input. The positioning of the floating L tone depends to a higher degree on the surrounding tones and LIN-T is high ranked. *H#↓L remains the undominated constraint. If the phrasal **Ⓛ** has shifted to the configuration H)ϕ L, it will be forced into the following p-phrase to avoid violating *H↓L. This violates LIN-T unless the tones that the floating L tone crosses are deleted. Deletion followed by HTS is therefore considered a repair mechanism to avoid violating LIN-T but still allowing **Ⓛ** to move away from a H)$_\phi$ L sequence. In tableau (19), the input is the winner

(e) from the first cycle where the phrasal (L) is positioned in the sequence H)$_\phi$L. If (L) stays here, *H$^{\downarrow}$L is violated (candidate (a)). If it is deleted, RM is violated (candidate (b)). If it shifts across the tones as in candidate (c) or (d), this violates LIN-T. Candidates (e-g) do not violate this constraint because (L) crosses tones which have been deleted. Candidate (f) is conform with A(DS,R; P,R) but violates the higher-ranked MAX-H by deleting H tones. The winner is (g) where only a L tone has been deleted. Contrary to candidate (e), this does not violate HAVE-T because HTS has applied. Note that the prefix is underlyingly toneless but is assumed to receive a default L tone in earlier strata at the lexical level.

(19) *Cycle 2 : Evaluation of the i-phrase* he-saw the.star this.morning (7a)

L L H H H (L) L H L H ((ndɔːnirɛ́ ɲʒata)$_\phi$ (roːsiːne)$_\phi$)$_\iota$	*H$^{\downarrow}$L	RM	Have-T	LIN-T	MAX-H	A(DS,R; P,R)	MAX|	MAX-L
a. L L H H H (L) L H L H ((ndɔːnirɛ́ ɲʒata)$_\phi$ (roːsiːne)$_\phi$)$_\iota$	*!							
b. L L H H H L H L H ((ndɔːnirɛ ɲʒata)$_\phi$ (roːsiːne)$_\phi$)$_\iota$		*!						*
c. L L H H H L H L H (L) ((ndɔːnirɛ ɲʒata)$_\phi$ (roːsiːne)$_\phi$)$_\iota$				**!**				
d. L L H H H L (L) H L H ((ndɔːnirɛ ɲʒata)$_\phi$ (roː siːne)$_\phi$)$_\iota$				*!		*		
e. L L H H H (L) H L H ((ndɔːnirɛ ɲʒata)$_\phi$ (roːsiːne)$_\phi$)$_\iota$			*!			*	*	*
f. L L H H H (L) ((ndɔːnirɛ ɲʒata)$_\phi$(roːsiː ne)$_\phi$)$_\iota$					*!*		****	**
☞g. L L H H H (L) H L H ((ndɔːnirɛ ɲʒata)$_\phi$ (roːsiːne)$_\phi$)$_\iota$						*	*	*

The same mechanism applies in tableau (20). The input has an all L-toned noun which forms a separate p-phrase. The phrasal (L) moves in order to avoid violating *H$^{\downarrow}$L. Candi-

date (e) is the winner where it has moved across deleted tones and HTS has applied to them. In this analysis, unbounded HTS is a consequence of (L) wanting to move away from the H)ϕ L configuration. The evidence of (L) being positioned in this i-phrase-final position is that it protects the H tones from being lowered thus preventing Flattening from applying.

(20) *Cycle 2: Evaluation of the i-phrase* he-gave a.star chillies

L L H H H (L) L L L L ((ndɔːnirɛ ɲʒata)$_\phi$ (βiri βi ri)$_\phi$)$_\iota$	*H'L	RM	Have-T	LIN-T	MAX-H	A(DS,R; P,R)	MAX/	MAX-L
a. L L H H H (L) L L L L ((ndɔːnirɛ ɲʒata)$_\phi$ (βiri βi ri)$_\phi$)$_\iota$	*!							
b. L L H H H L L L L ((ndɔːnirɛ ɲʒata)$_\phi$ (βiri βi ri)$_\phi$)$_\iota$		*!						*
c. L L H H H L L L L (L) ((ndɔːnirɛ ɲʒata)$_\phi$ (βiri βi ri)$_\phi$)$_\iota$				**!**				
d. L L H H H (L) ((ndɔːnirɛ ɲʒata)$_\phi$ (βiri βi ri)$_\phi$)$_\iota$			**!**				****	****
☞e. L L H H H (L) ((ndɔːnirɛ ɲʒata)$_\phi$ (βiri βi ri)$_\phi$)$_\iota$							****	****

5. Summary

This paper argued for the cyclic nature of floating L tones in Kikuyu. The proposal was a Stratal OT analysis with prosodic domains as strata. In Kikuyu, two post-lexical strata are needed. First, the domain-sensitivity of the floating L tones was derived in the p-phrase cycle. Second, the i-phrase cycle derived their tonal-motivated positioning. In this analysis, L tone deletion followed by unbounded HTS applies as a repair strategy which allows a floating L tone to move away from a banned tone sequence without undergoing metathesis.

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