

## Optimal Domains and Kikuyu Tonology: Spreading, Shifting, and Bidirectional Domains

Optimal Domains Theory (ODT) (Cassimjee and Kisseberth 1998) presents an efficient system for analyzing many Bantu tonal phenomena. ODT analyses thus far, however, have focused on languages in which tone moves only rightward or only leftward, and only shifts (away from the sponsor) or only spreads (adjacent morae express the same tone).

Kikuyu tone, in contrast, exhibits leftward movement, rightward movement, shifting *and* spreading. This paper expands ODT to account for Kikuyu and other Bantu languages with more complex tonology.

(1) shows that Kikuyu tone normally shifts one TBU (tone-bearing unit) rightwards. The first tone in the word, however, *spreads* rightwards to be expressed on the first two TBUs in the word. In (1), the final vowel's tone does not move.

(1)  $to_{L1}-ma_{H1}-rɔr_{L1}-ir-ε_{H1} \rightarrow t\grave{o}-m\grave{a}-r\acute{o}r-ir-\acute{e}$  'we looked at them'  
(root *rɔr*, stem extension *ir*)

Stem extensions in Kikuyu are toneless in the input. (2) shows that in verbs with multiple stem extensions, the tone of the stem shifts to the first extension, but the tone of the final vowel spreads leftward to cover the remaining stem extensions. (2) shows a Kikuyu word with rightward spreading, rightward shifting, and leftward spreading.

(2)  $to_{L1}-\gamma ar_{L2}-a\gamma-ar-i-\epsilon_{H1} \rightarrow t\grave{o}_{L1}-\gamma\grave{a}r_{L1}-\grave{a}\gamma_{L2}-\acute{a}r-i-\acute{e}$  'we rolled'  
(root *γar*, extensions *aγ*, *ar*, *i*)

(Data: Clements 1984)

Earlier ODT analyses use these constraints to determine direction of movement:

- (a) BASIC ALIGN LEFT/RIGHT (BAL/BAR) – Align a tone domain's left/right edge with the left/right edge of the TBU that sponsors the tone.
- (b) \*MONO(TD) – Prohibit tone domains containing only one TBU.

Languages ranking BAL>>\*MONO(TD)>>BAR have rightward tone movement; those ranking BAR>>\*MONO(TD)>>BAL have leftward.

I demonstrate that Kikuyu ranks \*MONO(TD)>>BAL>>BAR, meaning Kikuyu favors rightward movement, but leftward movement is preferred to a single-TBU domain. A newly-defined constraint explains why tones from final vowels continue spreading farther left:

- (c) ALIGN(TONE DOMAIN, L, STEM EXTENSIONS, L) (ALIGN SE L): Align the left edge of tone domains with the left edge of the series of stem extensions in a verb.

I argue that the relevant ranking for Kikuyu is \*MONO(TD)>>ALIGN SE L>> BAL>>BAR, allowing bidirectional movement of tones with leftward movement extending farther than rightward movement.

To explain the choice between tone shift and spread, earlier analyses use two constraints:

(d) EXPRESS(T) – Express the domain’s tone on every TBU in the domain.

(e) \*T, NONHEAD – Do not express the domain’s tone on TBUs other than the head.

The ranking EXPRESS(T)>>\*T, NONHEAD creates spreading languages, while the opposite creates shifting languages. I argue that neither of these applies to Kikuyu and that \*T, NONHEAD is unnecessary here. I propose adding this new constraint:

(f) EXPRESS HEAD(T) – Express the tone of a domain on the head of that domain

I show that ranking \*CONTOUR, EXPRESS HEAD(T)>>EXPRESS(T) yields the correct outcome for Kikuyu.

This paper extends Optimal Domains Theory to cover bidirectional tone movement and shifting and spreading within one language. The complexity added to the theory is motivated not only for the Kikuyu data above, but also for tonal phenomena of e.g. Makaa.