

## EXEMPLARS VERSUS MENTAL CATEGORIES IN THE TONAL PHONOLOGY OF YORUBA

Keywords: Phonology, Tones, Yoruba, Downstep, Reset

In Yoruba as in other tone languages, the fundamental frequency (f0) of a High (H) tone falls sharply when preceded by a Low (L) tone, a phenomenon known as DOWNSTEP. In some languages including Yoruba, however, after several Downsteps, the H tone is reset to a higher f0 value. In general, resets occur when the H tone begins to encroach into the Mid (M) tone band. While this fact is not particularly surprising, a more interesting and perplexing fact is that the level of reset is never as high as the f0 value of the initial H tone, and yet seems to be governed by specific criteria. As shown in Fig.1 below, successive resets tend to be progressively lower. In addition, however, speakers that produce ‘hard-landing’ patterns of Downstep (sharp drops at first, smaller drops later) as in Fig.2 below, produce relatively lower first resets, that can in that case be even lower than later ones. To solve this puzzle, and based on the detailed study of Yoruba in Laniran and Clements (2003), I advance the claim that speakers compute tonal patterns from abstract mental categories whose values are updated by successive exemplars as represented as gentle sloping lines in Figs. 1 and 2.

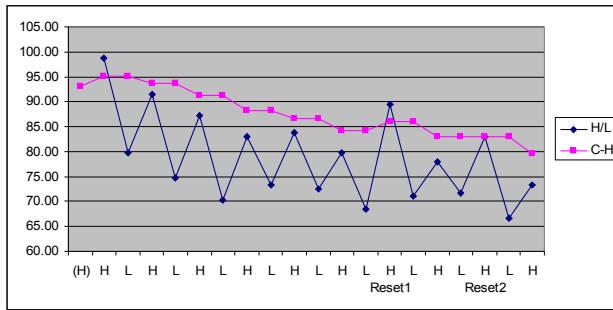


Fig. 1 Successive resets with a soft-landing pattern of Downstep

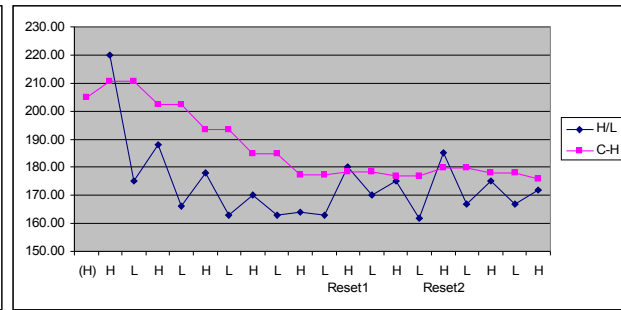


Fig. 2 Successive resets with a hard-landing pattern of Downstep

The updating function yielding each new value of the H tone Category (C-H) is taken to be a simple weighted average of the old value of C-H and the value of the new H exemplar at each point. Speakers are found to employ weights ranging around 2, the category having roughly twice the weight of the exemplar. The initial or canonical C-H shown in the figures (denoted as (H)) are surmised from other data in Laniran and Clements (2003) in which H tones are unaffected by Downstep or other variations. The reason why the first H is higher than this initial C-H is an additional effect named ‘High-Tone Raising’ (HTR). When followed by an L, an H tone is raised, a phenomenon intuitively understandable as preparation for a possible Downstep. As the figures suggest, the C-H is a good predictor of reset values, once one factors in the expected effect of HTR on the resets, as well as other smaller-scale factors that I will discuss.

In addition to the Reset, I will show further that the Downstep itself is computed from the C-H and *not* from a preceding H token as is commonly assumed, leading to the welcome conclusion that ‘resets’ are nothing but failed downsteps, amenable to the simple OT characterization in (1)

- (1)     Reset:             Maintain H/M-contrast >> Downstep

Under the ranking in (1), Downstep will fail when H tones approach the M range. As a result, the next H will simply be a manifestation of C-H, aside from HTR.

### References:

Laniran, Y.O, Clements, G.N (2003) ‘Downstep and High Raising: Interacting Factors in Yoruba Tone’, *Journal of Phonetics*, 2003, 31, 203-250.