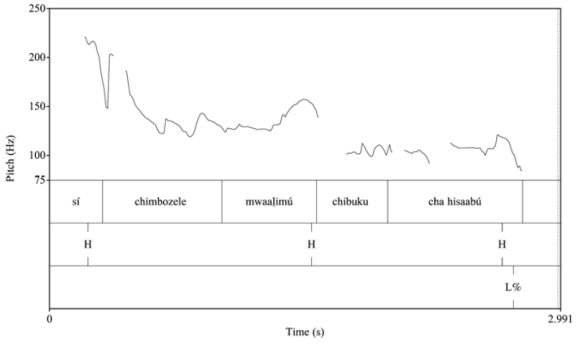
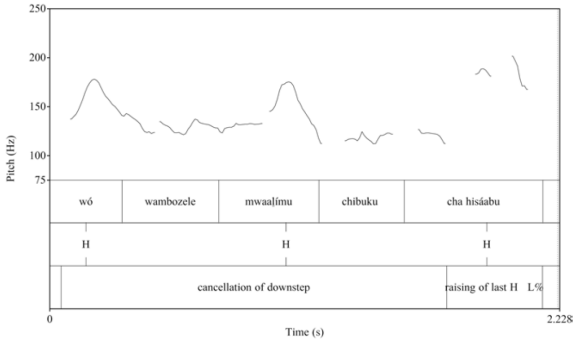
Downstep Blocking by Register Circumfixes

Main Claim: Downstep Blocking in interrogative utterances can be modelled as circumfixation of h-register features. **Downstep Blocking Data**: Global phonological processes, such as phrasal accent, have been a problem for generative phonology with a strict concatenative view. Q-Raising/Downstep Suppression in Hausa (Chadic) and Chimwiini (Bantu, Somalia) is one such process. In Hausa, automatic downstep occurs, i.e. high tones following low tones are usually downstepped in all contexts. However, downstep is blocked in the last phonological phrase of a polar question. In Chimwiini, non-automatic downstep is supressed in the whole utterance of polar questions. Otherwise, consecutive high tones are downstepped.

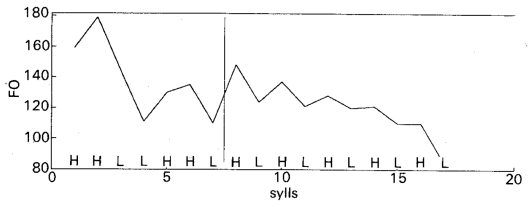
(1) Chimwiini: Declarative downstep (Kisseberth 2017)



(2) Chimwiini: No polar question downstep (Kisseberth 2017)

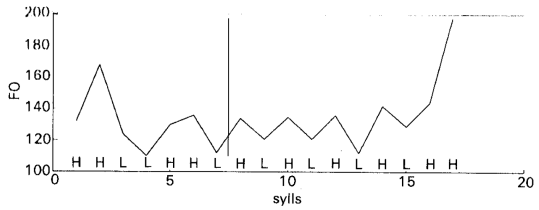


(3) Hausa: Declarative downstep (Inkelas & Leben 1990)



Yaa aikà wà Manii)$_\varphi$ làabaarìn wannàn yaaròn alàrammà

(4) Hausa: No polar question downstep (Inkelas & Leben 1990)



Yaa aikà wà Manii)$_\varphi$ làabaarìn wannàn yaaròn alàrammà

Register Circumfix Analysis: A high register circumfix attaches to the domain of downstep supression in questions. A CONTIGUITY constraint forces these registers to overwrite intervening high registers. Since the tonal root nodes are occupied, docking/spreading of low register is blocked. Therefore, downstep is blocked in questions. For this analysis to work, three assumptions are needed: (i) Colored Containment (van Oostendorp 2007; Revithiadou 2007): Constraints can make reference to the surface (visible) structure and/or complete structure. Phonology can only make reference to the identity or non-identity of morphological affiliation (ii) Register Tier Theory (Snider 1990): There is an autosegmental division between tones and registers. Register features h and l on one tier lower/raise pitch globally, whereas tone features H and L on another tier Tonal features lower/raise pitch locally. Both are linked to tonal root nodes (∘). (iii) Pivot Theory of Affixation (Yu 2007): Affixes are specified for the prosodic constituent and the position they attach to. I extend this notion, assuming that affixes can also take large hosts like intonational phrases and phonological phrases. In this case, one part of the circumfix is prefixed to the left edge of the phrase and the other part is suffixed to the right edge of the same phrase. **The Erasure Problem**: Affixed registers behave different from underlying ones. They spread through a whole domain whereas underlying

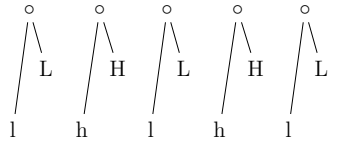
register features do not. As a solution, I propose a CONTIGUITY constraint (cf. Trommer 2011) that makes reference to both underlying and to surface structure.

(5) CONTIGUITY(register): Count one violation for every tonal root node $\circ_1$, such that
   a. $\circ_1$ is visibly associated to a register r_1 of color c_1 and
   b. r_1 intervenes between some registers of the same color c_2.

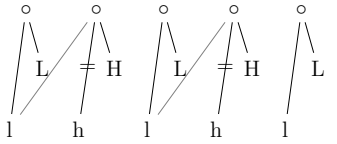
Hausa: Automatic downstep is triggered by a SHARE(low) constraint. This requires all pairs of adjacent tones to share a low register, thereby allowing register lowering of all high tones that are preceded by a low tone. Therefore, the structure in (6-b) with downstep is preferred over the structure in (6-a) without downstep in declarative sentences, i.e. if no high register circumfix is present. In questions however, I assume that a high register attaches to the last phonological phrase in the utterance. Since these encounter a large number of intervening register features, the candidate with downstep — where the register affixes remain floating (6d) incurs fatal violations of CONT(r). The winning candidate without downstep (6c) minimizes the number of CONT(r) violations by docking the high register circumfixes and vacuously overwriting all high registers. An independently high ranked MAX(l) constraint blocks further overwriting. This blocks the application of downstep in questions. The space needed for downstep is already taken up by the docked register circumfix. In **Chimwiini**: downstep (as low register insertion) is triggered by by an OCP(h) constraint against adjacent high registers. Similarly, however, a register circumfix around the whole utterance in polar questions overwrites all intervening high tones, again due to high ranked CONT(r). Since insertion of low registers would incur additional violations of CONT(r), downstep is blocked in questions. **Discussion**: Alternative approaches to overwriting face difficulties with these data. Cophonology Theory (Orgun 1996) easily derives global downstep deletion. Deletion of downstep only in the last phonological phrase would require a constraint explicitly refering to this domain. Alternative representations of downstep are similarly challenged by the data. Downstep is often represented as a floating low tone (i.a. Paster & Kim 2011). This would either require a process of floating tone insertion in statements or a floating tone deletion rule in questions. Both are difficult to model. **Selected References**: Inkelas, Sharon & William Leben. 1990. Where phonology and phonetics intersect: the case of Hausa intonation. In *Papers in laboratory phonology I: Between the grammar and physics of speech.* •Kisseberth, Charles. 2017. Chimwiini intonation. *Intonation in African tone languages.* •Snider, Keith L. 1990. Tonal upstep in Krachi: Evidence for a register tier. *Language* 66. •Trommer, Jochen. 2011. *Phonological aspects of Western Nilotic mutation morphology*: University of Leipzig dissertation. •Yu, Alan. 2007. *A natural history of infixation.*

(6) Downstep Blocking by Register Circumfixes in Hausa

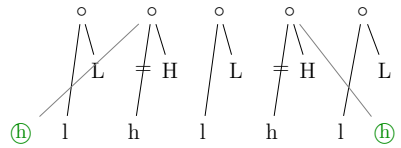
a. No downstep
CONT(r) ✔ ≫ SHARE(l) ✘



b. ☞ Downstep
CONT(r) ✔ ≫ SHARE(l) ✔



c. ☞ Downstep Supression
CONT(r) ✔ ≫ SHARE(l) ✘



d. Downstep
CONT(r) ✘ ≫ SHARE(l) ✔