A stratal account of tonal interactions in Eton

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Tone provides an ideal testing ground for observing how process application can alter across domains. Notably, it has recently gained attention under Harmonic Layer Theory (Zimmermann & Trommer 2022, Zimmermann 2024), which makes a specific prediction about possible intra-stratal changes — that processes can only be monotonically switched on or off. In this context, Eton (Bantu A71, Cameroon) offers an intricate case of tonal processes applying over different locality domains, and their interaction. These include several spreading patterns, dissimilation and plateauing, with the outcome conditioned by the stratum in which they apply. I will show that the Eton phenomena, including the facts that might appear anticyclic, can be accounted for within Stratal OT (Kiparsky 2000, 2015, Bermúdez-Otero 2018) with Containment (Prince & Smolensky 1993, Van Oostendorp 2006, Trommer 2011).

Data: I use the data from the grammatical description (Van de Velde 2008). Eton has 2 underlying levels (H, L), which can surface on a syllable as L, H, LH, HL, or \downarrow H. Syllable prominence is relevant for tone assignment in that only a prominent (roughly stem-initial) syllable can host a contour unconditionally, in particular, underlyingly. The major tonal processes include iterative and non-iterative rightward H-Spreading, Polarity and Plateauing (which in multi-syllabic cases is accompanied by leftward H-Spreading). The result of H-Spreading is dependent on the stratum, as outlined in (1).

(1)	word		clitic		phrase	
	$H - \underline{L}^1$	\rightarrow H – <u>HL</u>	$H = \underline{L}$	\rightarrow H = <u>HL</u>	H # <u>L</u>	\rightarrow H # <u>HL</u>
	$\mathrm{H}-\mathrm{L}.\mathrm{\underline{L}}$	$ ightarrow H - H.\underline{HL}$	H = L.L	\rightarrow H = H. <u>L</u>	H # L. <u>L</u>	\rightarrow H # H. <u>L</u>
	$\mathrm{H}-\mathrm{L}.\mathrm{\underline{H}}$	$ ightarrow H - H.\underline{H}$	H = L.H	\rightarrow H = H. <u>H</u>	H # L. <u>H</u>	ightarrow H # H. [↓] <u>H</u>

As can be seen, iterative H-Spreading is confined to the word-level sequence of non-prominent– prominent L targets (H–L.<u>L</u> \rightarrow H–H.<u>HL</u>). When a non-prominent L-toned syllable is followed by a prominent H, the replaced L leaves no trace at the word and clitic levels, however, at the phrase level it persists and triggers downstep on the following H.

There are polarity effects in Eton. Van de Velde (2008) distinguishes a separate tone which he refers to as dissimilating H — it realizes as H at the beginning of a phrase or after a L, and as HL after a H (interpreted as a L which has undergone H-Spreading). I will treat it as absence of tone, whereby a tone with the value opposite to the left context is epenthesized. The epenthetic tone can either trigger or undergo H-Spreading. Another tonal process, Plateauing, affects L tones associated to a prominent position when both preceded and followed by Hs. The result is a sequence of 2 Hs, with the latter H being downstepped. The above processes interact with one another: Plateauing blocks application of H-Spreading; H-Spreading feeds into Plateauing at word level and counterfeeds it in higher domains, as does the attachment of floating tones; Polarity feeds other processes.

Analysis: In the proposed account, I adopt Snider's (1999) system of subtonal feature representations, where L and H tones are represented as $\{L,l\}$ and $\{H,h\}$ respectively, and downstep results from a l-register linked to the same root node as a H-melody $\{H,l\}$. For computation, I assume the Stratal OT architecture, which allows constraint reranking between strata. Other assumptions include Containment and Cloning hypothesis (markedness constraints exist in 2 versions: a phonetic, evaluating only the output, and a global one — underscored throughout).

¹Underlining here stands for syllable prominence.

I assume that the constraint triggering spreading is *H.L, which bans a H-toned syllable followed by a L-toned one. It belongs to the family of *[+F][-F] constraints employed, for instance, in vowel harmony analyses (see, e.g., Mahanta 2012). Stratal differences arise from reranking between a positional faithfulness constraint requiring the h-register linked to the prominent syllable in the input to remain linked to it in the output, a global version of NoCROSSING, and a constraint militating against floating l-registers. The reranking also helps account for the counterfeeding facts.

Dissimilation is captured by the constraint UNIQUE τ that requires every TBU to have a tone on its own: it is not sufficient to simply spread a tone onto a toneless TBU, thus, epenthesis takes place. Further evidence for postulating such constraint comes from sequences of polar elements: here every next element dissimilates to the preceding one, that is tone insertion occurs on every polar syllable. OCP ensures that the inserted tone is of the opposite value to the preceding context. In order to capture directionality of OCP and the feeding effect of polarity, I assume that polar elements incorporate within prosodic words.

Below, I provide sample evaluations for H-Spreading at word level and for polar tone insertion accompanied by H-Spreading.

Word-level H-Spreading								Polarity									
Input: =	a.	$\operatorname{Max}^h_{\underline{\sigma}}$	CNT-TO-PR	<u>*H.L</u>	NoCross	$1 \rightarrow 0$	MAX	DEP	Input: = a.	$\sigma \to \tau$	CNT-TO-PR	Unique $ au$	*Spr-LF	Dep τ	*H.L	<u>OCP</u>	DEP
a.	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			*!					a. $\overset{\text{H}}{\downarrow}^{h}$	*!							
b.	$ \begin{array}{c c} \mathbf{h} & \mathbf{l} & \mathbf{h} \\ \mathbf{H} & \mathbf{L} & \mathbf{H} \\ \mathbf{h} &$		*!			 		*	b. $\overset{H}{\downarrow}$			*!					*
ва с.	$\begin{array}{c} \mathbf{h} \bigoplus_{\substack{\mathbf{H} \\ \mathbf{h} \\ \mathbf{h}$					 	***	*	$\mathbf{c}. \overset{\mathbf{h}}{\overset{\mathbf{H}}{\underset{\sigma}{\underset{\sigma}{\overset{\mathbf{H}}{\underset{\sigma}{\underset{\sigma}{\overset{\mathbf{H}}{\underset{\sigma}{\underset{\sigma}{\overset{\mathbf{H}}{\underset{\sigma}{\underset{\sigma}{\overset{\mathbf{H}}{\underset{\sigma}{\underset{\sigma}{\overset{\mathbf{H}}{\underset{\sigma}{\underset{\sigma}{\atop\sigma}{\atop\sigma}{\atop\tau}{\atop\tau}{\atop\tau}{\atop\tau}{\atop\tau}{\atop\tau}{\atop\tau}{\atop\tau}{\atop\tau}{\atop\tau$					*	*!		
d.	$\begin{array}{c} h \\ H \\ \sigma \\ \sigma$	*!					 ****	**						*			*

Word level H Spreading

To summarize, under the proposed analysis, all major tonal processes and their interactions can be derived within Stratal OT with Containment. This account contributes to the typology of process application across locality domains of different size and to the discussion of potential triggers for spreading (see, e.g., Rolle 2023).

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