Anticyclic Tone Polarity in Asante Twi

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Introduction

Tone Polarity

A tone in a morphologically derived form

is systematically different

from an underlying tone of the base form

Standard/Cyclic Tone Polarity

An affix tone is systematically different

from the closest base tone

Standard/Cyclic Tone Polarity

"In some languages, certain affixes have tones that are fully predictable from the tone of the foot to which they attach, but instead of receiving their tone by spreading in the usual way they show a tone that is the opposite of the neighbouring tone. Words that end in L take H affixes, and words that end in H take L affixes. This is termed 'polarity"' (Yip, 2002:159)

(see also Pulleyblank 1986 on Margi, Kenstowicz et al. on Mooré, Antilla & Bodomo 2001 on Dagaare, Trommer 2005 on Kanuri)

Problems with Tone Polarity in Asante Twi

Tone Polarity is anticyclic:

- Polarity surfaces on stems and floating tones, not on affixes

- Polarity is triggered by tones originating in distinct morphosyntactic words

Tone Polarity in the Asante Twi Perfect (Paster 2010)

CV H

ésí á-tɔ̀ pɛ̀n	'Esi has bought a pen.'
wá-tɔ̀ pɛ̀n	'You have bought a pen.'
yàw à-tɔ́ pɛ̀n	'Yaw has bought a pen.'
wà-tɔ́ pɛ̀n	'He has bought a pen.'

CVOV LH

ésí é-ꜜbísá àsɛ̀m	'Esi has asked something.'
wé-ꜜbísá àsɛ̀m	'You have asked something.'
yàw è-bísá àsɛ̀m	'Yaw has asked something.'
yè-bísá àsɛ̀m	'We have asked something.'

Tone Polarity in the Asante Twi Perfect

	Underlying Tone (Habitual)	**Polar Tone** (Perfect)
Noun H/Verb H	**ɛ́sí tó**	**ɛ́sí á-tò**
Noun L/Verb H	**yàw tó**	**yàw à-tó**
Noun H/Verb LH	**ɛ́sí bìsá**	**ɛ́sí á-!bísá**
Noun L/Verb LH	**yàw bìsá**	**yàw à-bísá**

Proposal

- Polarity in Asante Twi is cyclic & of the Base $\rightarrow$ Affix type
- Several markers of sentence-level inflection in Asante attach morphologically to preceding subjects, not to following verbs
- The location of polar tones is opaque
  – generated at the Word Level on an affix
  and subsequently shifted across words at the Phrase Level

Paster's Morphosyntactic Bracketing

	Subject		Verb	
Perfect	a-			
Negative Habitual		n-		
Negative Past	a-	n-		
Negative Future	H-	n-		
Future			bɛ-	
Progressive			V̀-	
Past			L-	-V̀
Negative Perfect		n-	H-	

Proposed Morphosyntactic Bracketing

	Subject		Verb	
Perfect	-a			
Negative Habitual		-n		
Negative Past	-a	-n		
Negative Future	-H	-n		
Future			bɛ-	
Progressive			V̀-	
Past			L-	-V̀
Negative Perfect	-n		H-	

Theoretical Assumptions

Theoretical Assumptions (Trommer 2011)

- **Stratal OT:** (Bermúdez-Otero 2012)
  Root-Level Stem-Level, and Word-Level Evaluations feed each other serially.
  Different levels have potentially different optimality-theoretic constraint rankings

- **Colored Containment:** (van Oostendorp 2006)
  Underlying material (i.e. nodes and association lines)
  is never literally deleted, but retained in the output,
  and marked as phonetically invisible.

- **Doubling:** (cf. Doubling in Correspondence Theory, McCarthy & Prince 1995)
  All markedness constraints are assumed to exist in two versions,
  one referring only to phonetically visible material,
  and one to all material in a given structure.

Analytic Assumptions

- Tone Polarity is an OCP effect

- Opacity follows from derivational ordering and constraint reranking in Stratal OT

Syntagmatic Polarity and the OCP (Leben 1973, Myers 1997)

Obligatory Contour Principle: Avoid identical tones linked to adjacent syllables

	OCP
☞ Stem Affix | | **L** **H**	
Stem Affix | | **L** **L**	*!

	OCP
Stem Affix | | **H** **H**	*!
☞ Stem Affix | | **H** **L**	

Polarity and Opacity in Kɔnni

Tone Polarity in Kɔnni (Cahill 2004:14)

Root	**Plural**	**Stem Tone**	**Suffix Tone**	
t**à**n	t**à**n-**á**	L	H	‘stone(s)’
b**ì:**s	b**ì:**s-**á**	L	H	‘breast(s)’
s**í**	s**í**-**à**	H	L	‘fish(es)’
zùnz**ú**	zùnz**ú**-**à**	H	L	‘maggot(s)’

Failure of Polarity in more Complex Forms (Cahill 2004)

Noun Class	**Sg.**	**Sg.Def.**	**Pl.**	**Pl.Def.**	
1	bì:s-íŋ	bì:s-ìrí	bì:s-á	bì:s-á-há	'breast'
2	gbǎ:-ŋ	gbà:-kú	gbà:-tí	gbà:-tí-tí	'courtyard'
3	nánjú-ŋ	nánjú-ká	nánjú-sí	nánjú-sí-sí	'fly'
4	nɔ̌-ŋ	nɔ̀ m-bú	nɔ̀ n-tí	nɔ̀ n-tí-tí	'meat'

Analysis: Polarity = OCP-effects + Opacity

- Polar plural affixes are attached at the Stem Level, definite plural affixes at the Word Level
- At the Stem Level the OCP is high-ranked, at the Word Level the OCP is low-ranked
- The Stem Level doesn't integrate floating features, the Word Level does integrate them
- No OCP-effects for Word-Level affixes and underlyingly floating features

Constraints

$\begin{matrix}\tau \\ \uparrow \\ \sigma\end{matrix}$	Assign $*$ to every syllable which is not associated to a tone
$\begin{matrix}\tau \\ \downarrow \\ \sigma\end{matrix}$	Assign $*$ to every tone which is not associated to a syllable
OCP	Assign $*$ to every pair of identical tones which are phonetically associated to adjacent syllable edges
$\textsc{Dep}\ \vert$	Assign $*$ to every morphological tone-syllable pair which is not asscociated morphologically, but phonetically
$\textsc{Dep}\ \tau$	Assign $*$ to every tone which is phonetic, but not morphological

Anti-Tautomorphemicity Constraint (van Oostendorp 2007)

ALTERNATION: Assign $*$ to every phonetic association line between tautomorphemic nodes

(undominated - never violated in Kɔnni)

Plural (Definite): Stem Level

Input: = d.	$\tau \uparrow \sigma$	Dep |	OCP	Dep τ	$\tau \downarrow \sigma$
☞ a. L **H** / tan -a				*	
b. L **L** / tan -a			*!		
c. L (tan -a)		*!			
d. L / tan -a	*!				

Plural Definite: Word Level

Input: = b.	$\tau \uparrow \sigma$	$\tau \downarrow \sigma$	Dep τ	Dep |	OCP
a. L H H tan -a -ha				*!	
☞ b. L H H tan -a -ha					*

Pure H-Stems vs. H + Floating-H Stems (Cahill 2004:7)

Floating-H Stem: Stem Level

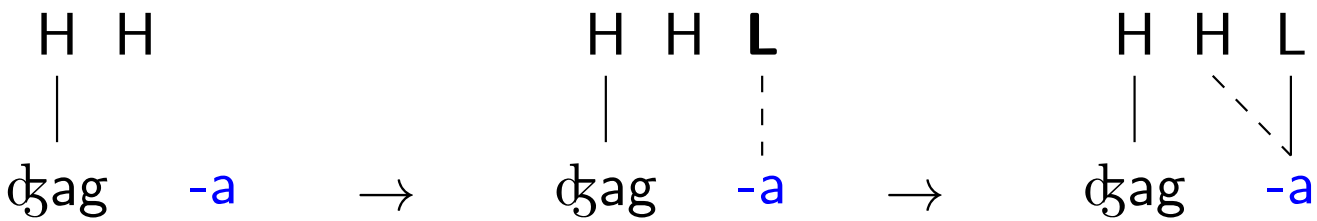
Input: = d.	$\tau \uparrow \sigma$	Dep |	OCP	Dep τ	$\tau \downarrow \sigma$
☞ a. H H **L** | ⋮ ʤag -a				*	
b. H H **H** | ⋮ ʤag -a			*!	*	
c. H H | ⟍ ʤag -a		*!	*		
d. H H | ʤag -a	*!				*

Floating-H Stem: Word Level

Input: = c.	τ ↑ σ	τ ↓ σ	Dep τ	Dep |	OCP
☞ a. H H L | ⟍ | ʤag -a				*	*
b. H **L** H L | ⟋ ⟍ | ʤag -a			*!	**	
c. H H L | | | ʤag -a		*!			

Crucial Counterbleeding Opacity in Kɔnni

The OCP triggers insertion of a L-tone
although this does not surface in a position
that would avoid an OCP-violation



Asante Twi

Asante Twi

- Major dialect of Akan, spoken by $\approx$ 2.8 million people in the South of Ghana
- Niger-Congo $>$ Atlantic Congo $>$ Kwa
- Complex and poorly understood two-tone system (see e.g. Dolphyne 1988, Marfo 2005, Kügler and Genzel 2012 for divergent views)
- All data in this talk are from Paster (2010)

Tone Polarity in Asante (Paster 2010)

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CVOV LH

ésí é-ꜜbísá àsɛ̀m	'Esi has asked something.'
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yè-bísá àsɛ̀m	'We have asked something.'

Tone Polarity in Asante

	Underlying Tone (Habitual)	**Polar Tone** (Perfect)
Noun H/Verb H	**ɛ́sí tó**	**ɛ́sí á-tò**
Noun L/Verb H	**yàw tó**	**yàw à-tó**
Noun H/Verb LH	**ɛ́sí bìsá**	**ɛ́sí á-!bísá**
Noun L/Verb LH	**yàw bìsá**	**yàw à-bísá**

Basic Analysis

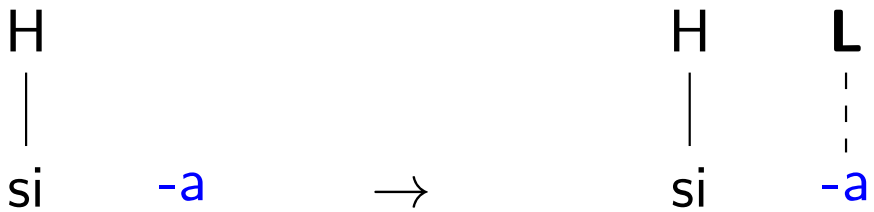
Basic Analysis

Perfect **a** . . .

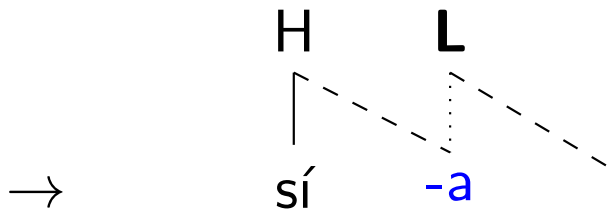
- . . . is a tonally underspecified suffix which attaches to the subject noun/pronoun **(Stem Level)**
- . . . becomes floating by a general process which spreads the tone of the root/stressed syllable to the right edge **(Word Level)**
- . . . attaches to the following verb root either overwriting its underlying tone or as downstep **(Phrase Level)**

Basic Analysis

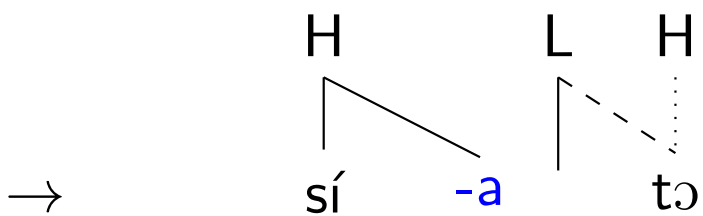
Stem Level



Word Level

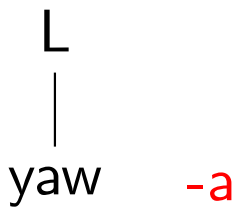


Phrase Level

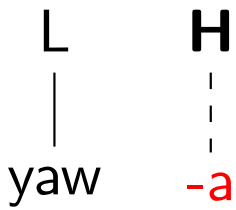


Basic Analysis

Stem Level

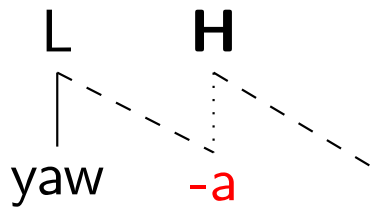


→



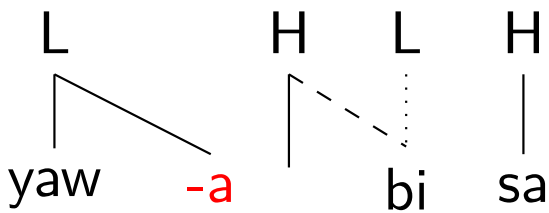
Word Level

→



Phrase Level

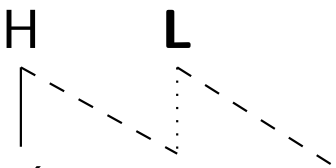
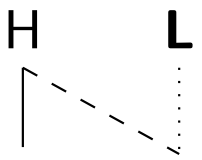
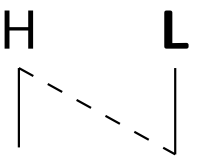
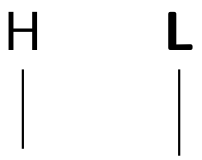
→



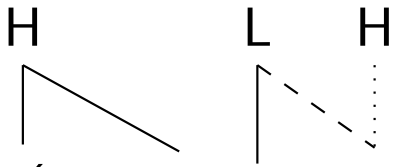
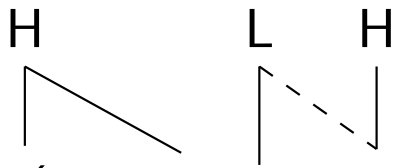
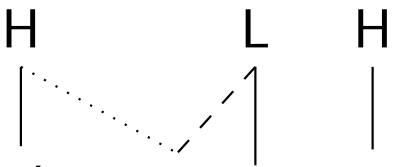
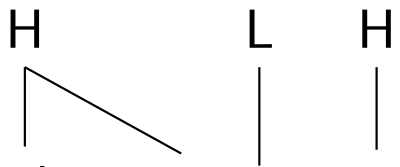
Perfect: Stem Level

Input: = d.	$\tau \uparrow \sigma$	Dep |	OCP	Dep τ	$\tau \downarrow \sigma$
☞ a. si -a (H, **L**)				*	
b. si -a (H, **H**)			*!		
c. si -a (H)		*!			
d. si -a (H)	*!				

Perfect: Word Level

Input: = d.	τ́ ↓ σ]	τ ⇓ π	Dep |	Max |
☞ a. 			**	*
b. 		*!	*	*
c. 	*!		*	
d. 	*!			

Perfect: Phrase Level

Input: = d.	τ ↓ σ	Alt	*Cont	Dep |	Max |
☞ a. 				*	*
b. 			*!	*	
c. 		*!		*	*
d. 	*!				

Floating L's and Plateauing

Plateauing (Phrase Level)

H L H → H !H H

Plateauing in Different Contexts

	H	**L**	**H**		**H**	**!H**	**H**	
Negative	Suffix	Verb	Verb					
Habitual	ési **ḿ**	**bì**	**sá**	→	ési **ḿ**	**!mí**	**sá**	'E doesn't ask'
Future	Prefix	Verb	Verb					
	ési **bé**	**bì**	**sá**	→	ési **bé**	**!bí**	**sá**	'E will ask'
Motional	Noun	Prefix	Verb					
	é**sí**	**kò**	**tó**-ó	→	é **sí**	**!kó**	**tó**-ó	'E goes asking'

Paster (2010)

Downstep is a floating L-tone:

H L H → H (L) H H

(cf. also Schuh 1978, Hyman 1979, Pulleyblank 1986)

3 Floating L-Tones

Past (consistent L on the initial verb-σ)

	H	(L)	...				
LH Verbs	ési	(L)	**bì**	**sá**	→	ési **bì sá**-à	'E didn't ask'
H Verbs	ési	(L)	**tó**-ò		→	ési **tò**-ò	'E didn't buy'

Negative Habitual (consistent downstep on the initial verb-σ)

	H	(L)	...				
LH Verbs	ési **ḿ**	(L)	**mì**	**sá**	→	ési **ḿ!mí sá**	'E doesn't ask'
H Verbs	ési **ń**	(L)	**tó**		→	ési **ḿ !tó**	'E doesn't buy'

Perfect (mixed)

	H	(L)	...				
LH Verbs	ési **á**	(L)	**bì**	**sá**	→	ési **é!bí sá**	'E has asked'
H Verbs	ési **á**	(L)	**tó**		→	ési **á tò**	'E has bought'

Overwriting in Colored Containment

$$\begin{matrix}\tau \\ \downarrow \\ \sigma\end{matrix}$$

Assign $*$ to every tone which is not dominated by a morphological syllable

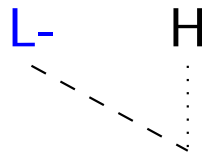
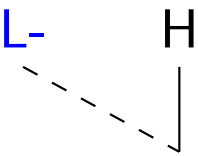
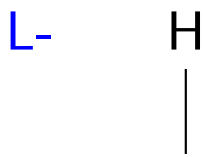
$$\begin{matrix}\tau \\ \Downarrow \\ \sigma\end{matrix}$$

Assign $*$ to every tone which is not **phonetically** dominated by a morphological syllable

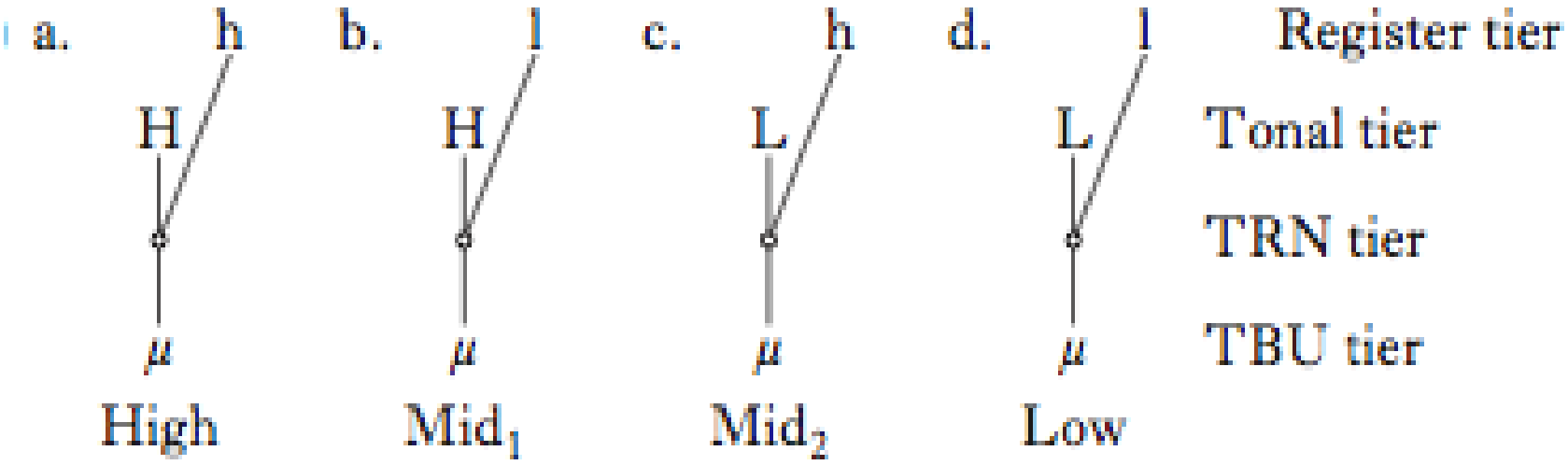
Overwriting in Colored Containment

- $\tau \Rightarrow \sigma$ requires realization of preassociated **and** floating tones
- $\tau \rightarrow \sigma$ favors phonetic realization of floating tones
  since they can only be associated by overt association
- $\tau \rightarrow \sigma$ is agnostic about overt association of preassociated tones
  because their underlying association cannot be completely removed
  (due to Containment)
- If a floating and a preassociated tone cannot cooccur
  due to phonotactics, the floating tone survives
  and the preassociated tone is overwritten

Overwriting in Colored Containment

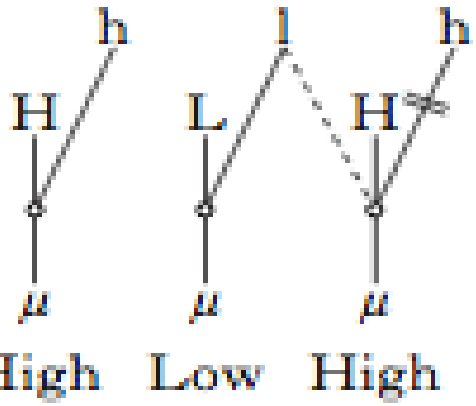
Input: = c.	$\tau \downarrow \sigma$	*Rise	Max τ	$\tau \Downarrow \sigma$
☞ a. 			*	*
b. 		*!		
c. 	*!			*

Representation of Tone and Downsteps in Snider (1999)

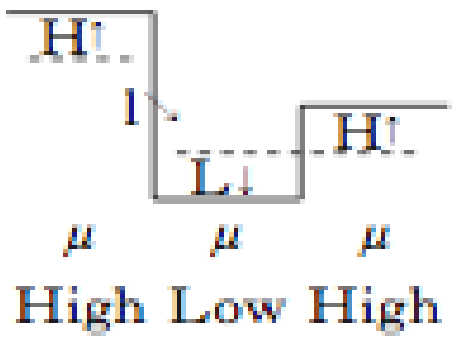


Downstepped High (automatic)

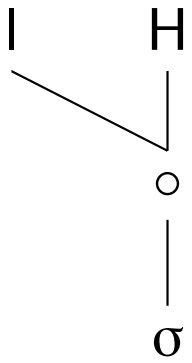
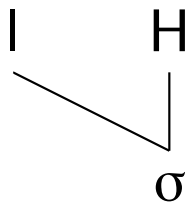
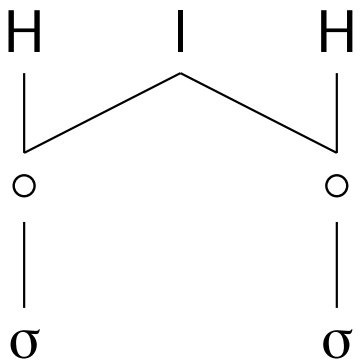
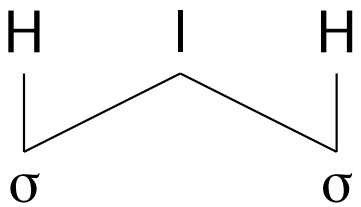
a. *structural representation*



b. *phonetic representation*

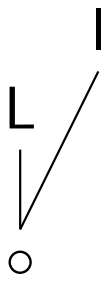


Representation of Tone and Downsteps in Snider (1999)

	Full Representation	**My Abbreviation**
Mid Tone:		
Downstepped H:		

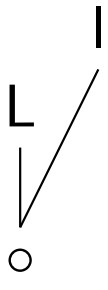
Underlying Representations

Perfect:



(Phrase-Level)

Past:



(Word Level)

Negative Habitual:

(Phrase-Level)

Plateauing in Different Contexts

	H	**L**	**H**		**H**	**!H**	**H**	
Negative Habitual	Suffix ési **ḿ**	Verb **bì**	Verb **sá**	→	ési **ḿ**	**!mí**	**sá**	'E doesn't ask'
Future	Prefix ési **bé**	Verb **bì**	Verb **sá**	→	ési **bé**	**!bí**	**sá**	'E will ask'
Motional	Noun ési	Prefix **kò**	Verb **tó**-ó	→	é **sí**	**!kó**	**tó**-ó	'E goes asking'

No Plateauing

Root-Root:

	H	L	H		H	L	H	
Habitual	Noun	Verb	Verb					
	ésí	**bì**	**sá**	→	ésí	**bì**	**sá**	'E asks'
Past	Noun	Verb	Verb					
	ésí	**bì**	**sá**-à	→	ésí	**bì**	**sá**-à	'E asked'

HLLH:

	H	L	L	H		H	L	L	H	
Progressive	Noun	Prefix	Verb	Verb						
	ésí	**ì**	**bì**	**sá**	→	ésí	**ì**	**bì**	**sá**	'E is asking'

Generalizations on Downstep

- Downstep only occurs between two H-tone syllables
- Downstep only occurs at morpheme boundaries

Generalizations on Plateauing

- Plateauing always spreads the right H-tone to the left
- H-tone spread in Plateauing is non-iterative
  (affects maximally one L-tone σ)
- Plateauing is blocked between a noun root and a verb root

Undominated Constraints on Register Tones

$_{\text{I}}\text{L}_{\text{I}}$	Assign $*$ to every L which is connected to two instances of I
$\text{H}\leftarrow\text{I}\rightarrow\text{H}$	Assign $*$ to every I-tone which is connected to one H, but not to two adjacent Hs.
$*\text{R}_{\text{I}}\text{R}$	A I-register may not be associated to two root morpheme syllables

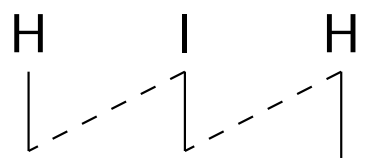
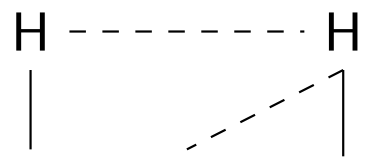
More Undominated Constraints on Plateauing

* $[\tau]_3$	A tone span should not involve more than two TBUs
*SPREAD-R	Assign $*$ to every epenthetic association line in a tone span S which is preceded by a colored association line in S.

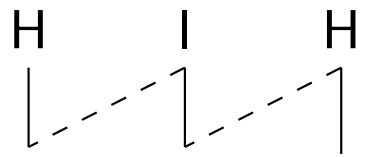
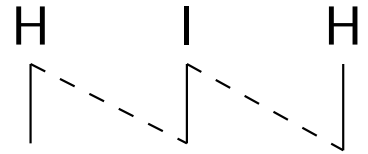
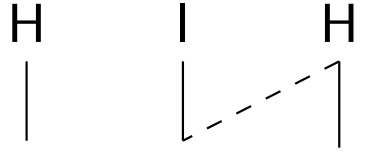
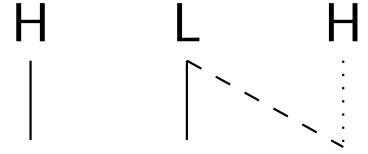
Lower Ranked Constraints Governing Plateauing

$\begin{matrix} \text{I} \\ \Downarrow \\ \circ \end{matrix}$	Assign $*$ to every I-register tone which isn't phonetically dominated by a $\circ$-node
* $\underline{\text{H}\leftrightarrow\text{H}}$	Two phonetic H-tones not separated by another phonetic H-tone should be connected
$\textsc{Max}$ L	Assign $*$ to every morphological L-tone which is not phonetic

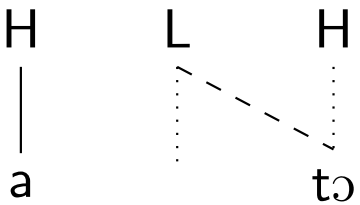
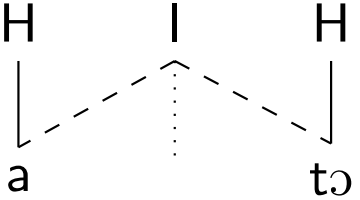
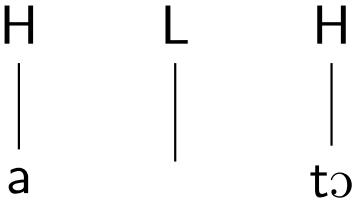
Plateauing without Floating Ⓛ (Future LH-Verb)

Input: = c.	*$\mathrm{R_L R}$	H←I→H	I ⇓ ○	H↔H	Max H	Max L
☞ a. 						*
b. 			*!			*
c. 				*!		

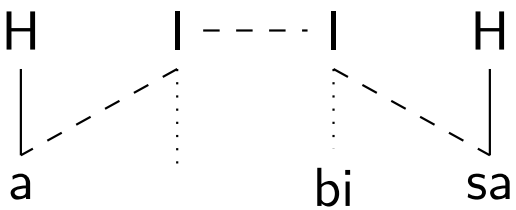
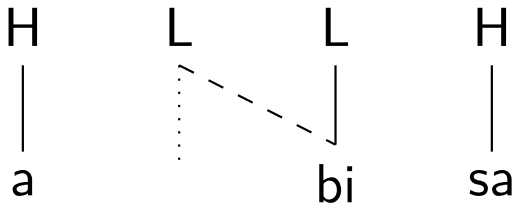
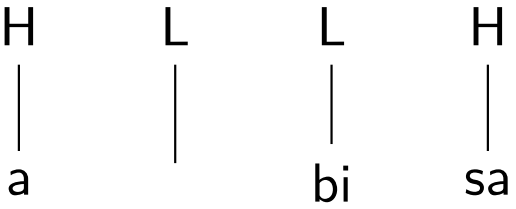
Plateauing without Floating Ⓛ (more options)

Input: = ←	*Sprd-R	H←I→H	⇓	H↔H	Max H	Max L
☞ a. 						*
b. 	*!					*
c. 		*!				*
d. 					*!	

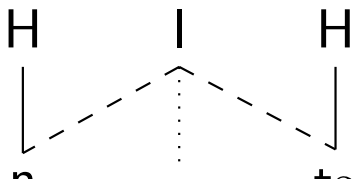
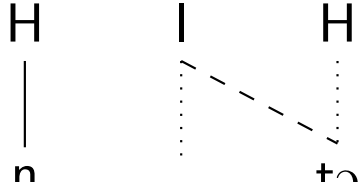
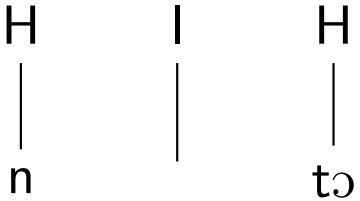
Perfect – H-Verb (floating Ⓛ at Phrase Level)

Input: = c.	H↔H	L ↓ σ	MAX H	MAX L
☞ a. 			*	
b. 		*!		
c. 	*!	*		

Perfect – LH-Verb (floating Ⓛ at Phrase Level)

Input: = c.	H↔H	L ↓ σ	MAX H	MAX L
☞ a. 			*	
b. 	*!			
c. 		*!		

Negative Habitual – H-Verb (floating Ⓘ at Phrase Level)

Input: = c.	I ⇓ ○	H←I→H	L ↓ σ	MAX H	MAX L
☞ a. 					
b. 		*!		*	
c. 	*!				

Negative Habitual – LH-Verb (floating (l) at Phrase Level)

Input: = c.	l ⇓ ○	$_{l}L_{l}$	H←l→H	MAX H	MAX L
☞ a. H l - - - - l H / m bi sa	*!				*
b. H l L H / m bi sa		*!	*!		
c. H l L H / m bi sa	*!				

Past – H-Verb (floating Ⓛ at Word Level)

Input: = c.	τ ↓ σ	*Rise	τ ⇓ π	Max H	...
☞ a. L H \ : tɔ			*	*	
b. L H \ | tɔ		*!			
c. L H | tɔ	*!				

Past – H-Verb (Phrase Level)

Input: = d.	H←I→H	*R$_{\text{I}}$R	I ⇓ ○	*HLH	MAX H
a. H L H | ⋮ ⟋ | si]$_{\text{R}}$ $_{\text{R}}$[bi sa			*!		
b. H I H | ⟋ ⟋ | si]$_{\text{R}}$ $_{\text{R}}$[bi sa		*!			
c. H I H | | si]$_{\text{R}}$ $_{\text{R}}$[bi sa	*!				
☞ d. H L H | | | si]$_{\text{R}}$ $_{\text{R}}$[bi sa				*	

Floating H's and Nasal Doubling

3 Floating H-Tones

Perfect (Consistent H on initial V-σ)

	L	(H)	...				
LH Verbs	yàw **à**	(**H**)	**bì**	sá	→	yàw **è bí**sá	'Y has asked'
H Verbs	yàw **à**	(**H**)	**tó**		→	yàw **à tó**	'Y has bought'

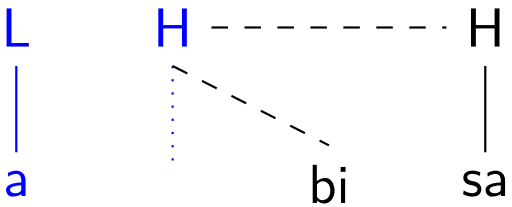
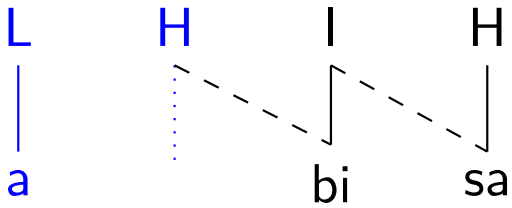
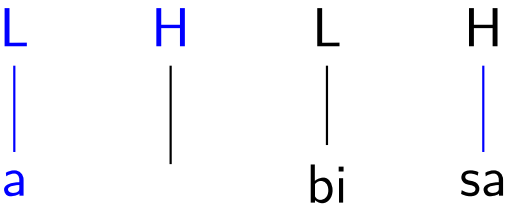
Negative Perfect (Consistent H on initial V-σ)

	H	(H)	...				
LH Verbs	yàw **ǹ**	(**H**)	**bì**	sá	→	yàw **m̀ mí**sá	'Y hasn't asked'
H Verbs	yàw **ǹ**	(**H**)	**tó**		→	yàw **ǹ tó**	'Y hasn't bought'

Negative Future (Consistent H on doubled negative -n)

	H	(H)	...				
LH Verbs	yàw	(**H**)	**ǹ bì**	sá	→	yàw **ḿḿ!mí**sá	'Y won't ask'
H Verbs	yàw	(**H**)	**ǹ tó**		→	yàw **ńń!tó**	'Y won't buy'

Perfect – LH-Verb (*R$_{|}$R blocks downstep)

Input: = c.	*R$_{|}$R	H←I→H	$\begin{matrix}\text{H}\\ \downarrow\\ \sigma\end{matrix}$	$\begin{matrix}\text{I}\\ \Downarrow\\ \circ\end{matrix}$	<u>H↔H</u>	Max L
☞ a. 				*		*
b. 	*!					*
c. 			*!		*	

Nasal Doubling in the Negative Future

CV H

ésí ń-ꜜtɔ́ pɛ̀n	'Esi will not buy a pen.'
wó ń-ꜜtɔ́ pɛ̀n	'You will not buy a pen.'
yàw ńń-ꜜtɔ́ pɛ̀n	'Yaw will not buy a pen.'
yɛ́ ń-ꜜtɔ́ pɛ̀n	'We will not buy a pen.'

CVOV LH

ésí ḿ-ꜜmísá àsɛ̀m	'Esi will not ask something.'
mó ḿ-ꜜmísá àsɛ̀m	'You pl. will not ask something.'
yàw ḿḿ-ꜜmísá àsɛ̀m	'Yaw will not ask something.'
ó ḿ-ꜜmísá àsɛ̀m	'He will not ask something.'

Nasal Doubling

- The future negative allomorph is (H)
- A (negative) nasal must share the tone with another segment
- If the preceding (pro)noun tone is H the H's fuse
  and are shared by (pro)noun + nasal
- if a preceding pronoun is L, future (H) overwrites the pronominal tone
- if a preceding noun is L, negative n is doubled

Additional Constraints for the Negative Future

$[_{\sigma}N_{\sigma}]_{\tau}$	A tone span covering a nasal should contain at least two syllables
MAX	Preserve morphological tones of lexical root morphemes
τ_{Lex}	
$*H_{l}$	Don't connect a l-register tone to a H-tone

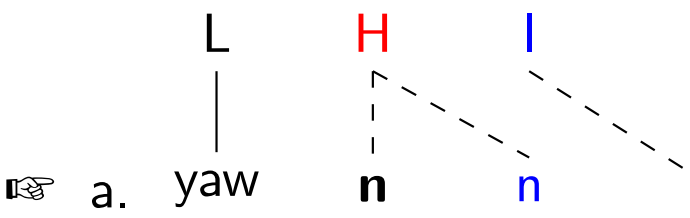
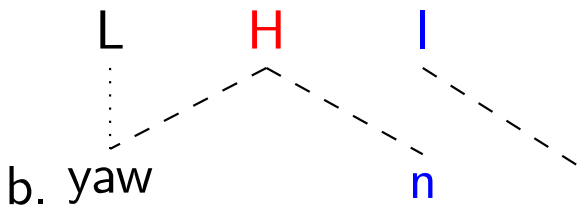
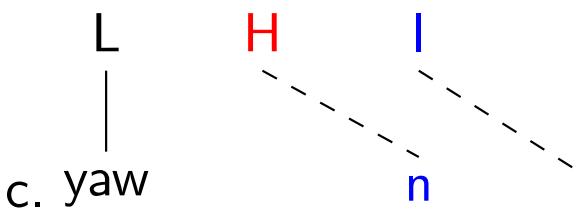
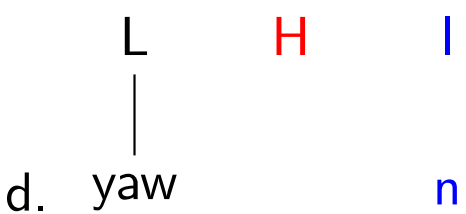
Negative Future – H-Noun (floating Ⓗ + Ⓘ at Word Level)

Input: = d.	$[_{\sigma}N_{\sigma}]_{\tau}$	H ↓ σ	MAX τ_{Lex}	MAX τ	DEP SEG	*H_I	I ⇓ π
☞ a. si n (H - - - H, I)							
b. si **n** n (H, H, I)					*!		
c. si n (H, H, I)	*!						
d. si n (H, H, I)	*!	*					

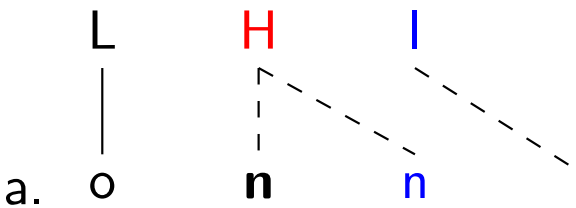
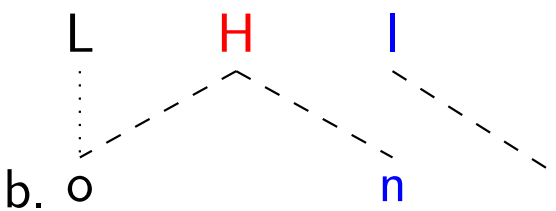
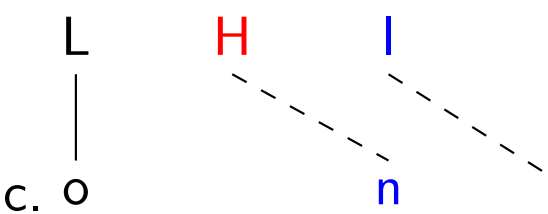
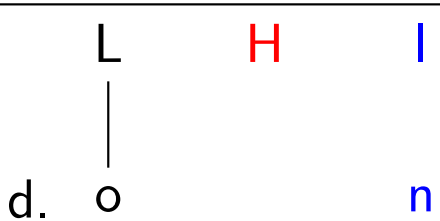
Negative Future – H-Noun (more options)

Input: = ←	$[_{\sigma}N_{\sigma}]_{\tau}$	H ↓ σ	Max τ_{Lex}	Max τ	Dep Seg	*$H_{|}$		⇓ π
☞ a. si n								
b. si n								*!
c. si n							*!	

Negative Future – L-Noun (floating Ⓗ + Ⓘ at Word Level)

Input: = c.	$[_{\sigma}N_{\sigma}]_{\tau}$	H ↓ σ	Max τ_{Lex}	Max τ	Dep Seg	*H_I	I ⇓ π
☞ a. 					*		
b. 			*!				
c. 	*!						
d. 	*!	*					

Negative Future – L-Pronoun (floating Ⓗ + Ⓘ at Word Level)

Input: = c.	$[_{\sigma}N_{\sigma}]_{\tau}$	H ↓ σ	Max τ_{Lex}	Max τ	Dep Seg	*H_I	I ⇓ π
a. 					*!		
☞ b. 							
c. 	*!						
d. 	*!	*					

Segmental Processes

Segmental Processes

- Vowel Spreading
- Vowel Harmony
- Nasal Place Assimilation

Vowel Spreading

CV H

ésí ꜜí-tɔ́ pɛ̀n	‘Esi is buying a pen.’
ɔ́mɔ́ ꜜɔ́-tɔ́ pɛ̀n	‘They are buying a pen.’
yàw ẁ-tɔ́ pɛ̀n	‘Yaw is buying a pen.’[6]
mì ì-tɔ́ pɛ̀n	‘I am buying a pen.’

CVOV LH

ésí ì-bìsá àsɛ̀m	‘Esi is asking something.’
wó ò-bìsá àsɛ̀m	‘You are asking something.’
yàw ẁ-bìsá àsɛ̀m	‘Yaw is asking something.’
mì ì-bìsá àsɛ̀m	‘I am asking something.’

[ATR]-Harmony

$$V[\text{-ATR}] \rightarrow [+\text{ATR}] \; /\_\_\_ V[+\text{high } +\text{ATR}]$$

- affects all functional elements to the left of V
- i.e., pronouns, but not nouns

[ATR]-Harmony

CV H

ésí bɛ́-tɔ́ pɛ̀n	‘Esi will buy a pen.’
wó bɛ́-tɔ́ pɛ̀n	‘You will buy a pen.’
yàw bɛ́-tɔ́ pɛ̀n	‘Yaw will buy a pen.’
ɔ̀ bɛ́-tɔ́ pɛ̀n	‘He will buy a pen.’

CVOV LH

ésí bé-!bísá àsɛ̀m	‘Esi will ask something.’
mó bé-!bísá àsɛ̀m	‘You pl. will ask something.’
yàw bé-!bísá àsɛ̀m	‘Yaw will ask something.’
ò bé-!bísá àsɛ̀m	‘He will ask something.’

Nasal Place Assimilation (Negative Habitual)

ésí ń-ꜜtɔ́ pɛ̀n	‘Esi doesn’t buy pens.’
wó ń-ꜜtɔ́ pɛ̀n	‘You don’t buy pens.’
ésí ḿ-ꜜmísá àsɛ̀m	‘Esi doesn’t ask something.’
wó ḿ-ꜜmísá àsɛ̀m	‘You don’t ask something.’
ésí ŋ́-ꜜkáé kòfi	‘Esi doesn’t remember Kofi.’
wó ŋ́-ꜜkáé kòfi	‘You don’t remember Kofi.’

Summary

Proposed Morphosyntactic Bracketing

	Subject		Verb	
Perfect	-a			
Negative Habitual		-n		
Negative Past	-a	-n		
Negative Future	-H	-n		
Future			bɛ-	
Progressive			V̀-	
Past			L-	-V̀
Negative Perfect	-n		H-	

Spreading Processes

Subject $\leftrightarrow$ Affix

- Tone spreading Subject $\rightarrow$ Affix
- Nasal Doubling Subject $\leftarrow$ Affix
- Vowel Spreading Subject $\rightarrow$ Affix

Affix $\leftrightarrow$ Verb

- Association of Floating-Tone affixes Affix $\rightarrow$ Verb
- Vowel harmony Affix $\leftarrow$ Verb
- Nasal Place Assimilation Affix $\leftarrow$ Verb

Subject $\leftrightarrow$ Affix $\leftrightarrow$ Verb

- Tone Polarity Subject $\rightarrow$ Affix $\rightarrow$ Verb
- Plateauing

Summary – Anticyclicity

- A speculative morphosyntactic structure allows for a coherent picture of stratal tonology:

- **Word Level:**
  - Polarity
  - Unconditional realization of floating tones

- **Phrase Level:**
  - Plateauing
  - Conditional realization of floating tones

- **More potential anticyclicity:** Phrase-level plateauing has access to properties of morphemes (root vs. affix, lexical vs. functional)

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Overview