Containment as the key to the 'heavy-vs-long' geminate debate

mfm 23

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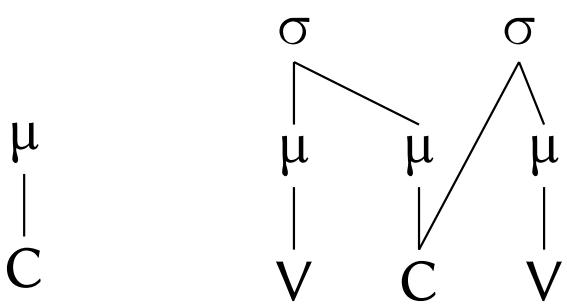
Introduction

Geminate representations (Ringen and Vago, 2011, 156)

(1) a. *The syllabic weight analysis of geminates*

Underlying *Intervocalic*



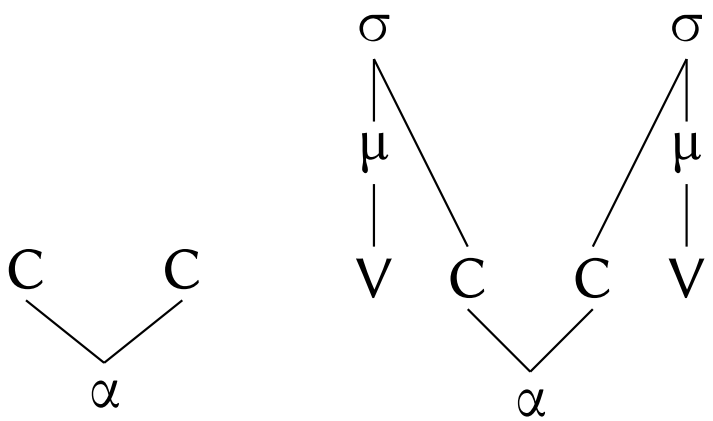
Syllable Tier

Mora Tier

Timing Tier

b. *The segmental length analysis of geminates*

Underlying *Intervocalic*



Syllable Tier

Mora Tier

Timing Tier

Melody Tier(s)

Weight for singleton (C) and geminate (G) codas

(2)

	CVC	CVG
I.	light	light
II.	heavy	heavy
III.	light	heavy
IV.	heavy	light

Weight for singleton and geminate codas: Predictions

Predicted under the 'length' theory:

(3)

	CVC	CVG
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- weight is a derived property of geminates
- geminates in coda position should always pattern uniformly alongside the singleton codas

➙ **Principle of Equal Weight for Codas** (Tranel, 1991)

Weight for singleton and geminate codas: Predictions

Predicted under the 'weight' theory:

(4)

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Weight for singleton and geminate codas: Predictions

Predicted under the 'weight' theory:

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	CVC	CVG
I.	light	light
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- geminates are inherently moraic
- weight is only a derived property of singleton codas

Weight for singleton and geminate codas: Empirical picture

	CVC	CVG	*Example*
I.	light	light	*Selkup (cf. Tranel, 1991)*
II.	heavy	heavy	*Latin (cf. Tranel, 1991)*
III.	light	heavy	*Hausa (cf. Davis, 2011)*
IV.	heavy	light	*Ngalakgan (cf. Baker, 2008)*

Main Claim

- **geminates are underlying moraic** but might not emerge as such on the surface (Davis, 2011)
- formalized through an extension of Containment Theory within OT (Prince and Smolensky, 1993/2004)

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→ all four language types in (4) can be predicted

→ also accounts for asymmetries found for edge geminates

→ **bridges the gap between between the segmental and prosodic** accounts of geminates without employing a Composite Model that simultaneously uses x-slots and moras (Curtis, 2003)

Theory: Geminates are moraic

Theoretical background

Assumption: Coloured Containment (van Oostendorp, 2006; Revithiadou, 2007; Trommer, 2011; Zimmermann, 2014; Trommer and Zimmermann, 2014)

(5) *Containment (Prince and Smolensky, 1993/2004)*
Every element of the phonological input representation is contained in the output.

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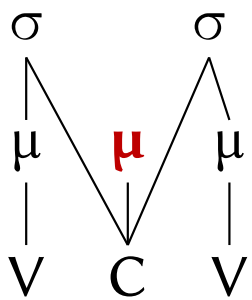
(5) *Containment (Prince and Smolensky, 1993/2004)*
Every element of the phonological input representation is contained in the output.

1. **No deletion**: unrealized elements are not integrated under the highest prosodic node (=Stray Erasure, McCarthy, 1979; Steriade, 1982; Itô, 1988)

(6) *Weightless consonant*



→ both syllables are light, the second μ remains phonetically uninterpreted

Assumption: Coloured Containment (van Oostendorp, 2006; Revithiadou, 2007; Trommer, 2011; Zimmermann, 2014; Trommer and Zimmermann, 2014)

2. **No deletion of association lines**: they can only be marked as 'phonetically invisible' (=not interpreted)

(7) *Marking conventions for different types of association lines*

Morphological association lines		Epenthetic association lines	
phonetically visible:	phonetically invisible:	phonetically visible:	phonetically invisible:
a.	b. 	c.	d. 

3. All morphemes have a 'colour' (=affiliation); epenthetic elements are colourless (=grey background)

Phonetic interpretation: geminates (to be revised)

(8) *The phonetic interpretation of geminates*
A consonant can be interpreted as phonetically long iff it is **linked to more than one syllable**.

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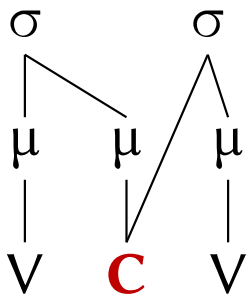
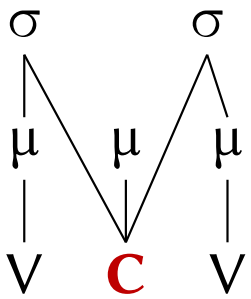
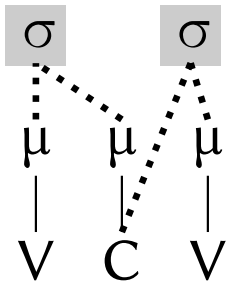
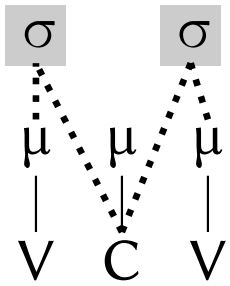
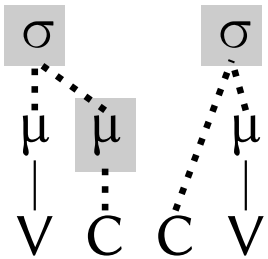
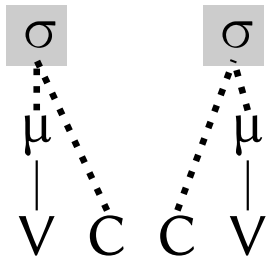
(9) *Possible geminates*

a. 

b. 

Underlyingly (non)moraic consonants and syllable weight

(10)

	…can contribute to syllable weight	**…can be irrelevant for syllable weight**
Geminate:	a. 	b. 
Non-geminate:	c. 	d. 

Choice: Contribution to syllable weight?

For geminates (=underlyingly moraic)

Is the underlying μ integrated under a σ node in a phonetically visible way?

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Is a μ assigned to the C and integrated under a σ node in a phonetically visible way?

→ the (non)moraicity of geminates is not bound to the (non)moraicity of singleton codas

Predicting the four language types

Constraints

(11)

a. ONSET! (=ONS!)

Assign * for every σ without a phonetically visible onset consonant.

b. WEIGHTBYPOSITION (=WBP)

Assign * for every coda consonant that is not phonetically dominated by a μ.

c. *C^{μ}

Assign * for every consonant that is phonetically dominated by a phonetically visible μ.

d. *$_{\sigma}[C^{\mu}$

Assign * for every consonant that is phonetically visibly dominated by a μ but not in coda position.

e. MAX-μ

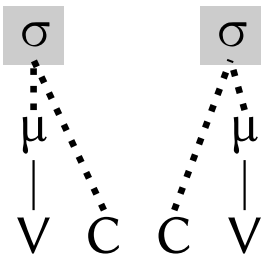
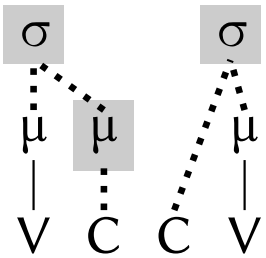
Assign * for every phonetically invisible μ.

f. DEP-μ

Assign * mark for every epenthetic μ.

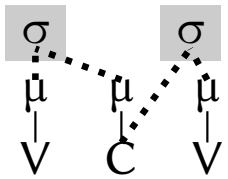
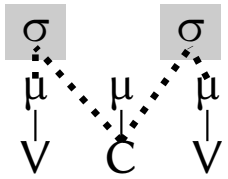
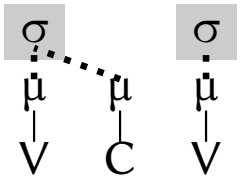
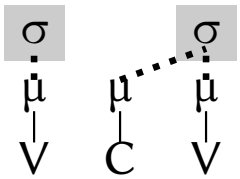
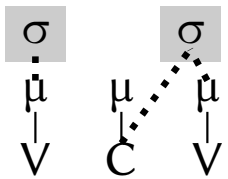
Type I: Selkup

(12) *CVC=light*

μ μ | | V C C V	*σ[C$^{\mu}$	Ons!	*C$^{\mu}$	Dep μ	WBP	Max μ
☞ a. 					*	
b. 			*!	*!		

Type I: Selkup – CVG=light

(13)

	μ μ μ V C V	*σ[C$^{\mu}$	Ons!	*C$^{\mu}$	Dep μ	Wbp	Max μ
a.				*!			
☞ b.							*
c.			*!	*!			
d.		*!		*!			
e.		*!					*

Type II: Latin

(14)

	*σ[Cμ	Ons!	WBP	Dep μ	Max μ	*Cμ
Vμ C C Vμ	i. CVC=heavy					
a. Vμ C.CVμ			*!			
☞ b. Vμ Cμ.CVμ				*		*
Vμ Cμ Vμ	ii. CVG=heavy					
☞ a. Vμ Cμ Vμ						*
b. Vμ C(μ) Vμ					*!	
c. Vμ Cμ.Vμ		*!				*
d. Vμ.Cμ Vμ	*!					*

Type III: Hausa

(15)

	*σ[Cμ	Ons!	Dep μ	WBP	Max μ	*Cμ
Vμ CCVμ	i. CVC=light					
☞ a. Vμ C.CVμ				*		
b. Vμ Cμ.CVμ			*!			*
Vμ Cμ Vμ	ii. CVG=heavy					
☞ a. Vμ Cμ Vμ						*
b. Vμ C(μ) Vμ					*!	
c. Vμ Cμ.Vμ		*!				*
d. Vμ.Cμ Vμ	*!					*

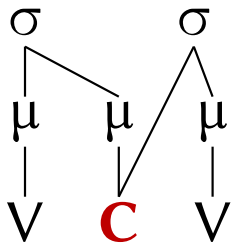
Type IV: Ngalakan

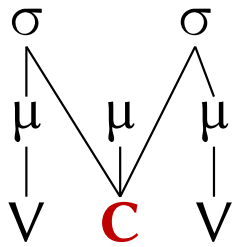
(16)

	*σ[Cμ	Ons!	WBP	*Cμ	Dep μ	Max μ
Vμ CCVμ	i. CVC=heavy					
a. Vμ C.CVμ			*!			
☞ b. Vμ Cμ.CVμ				*	*	
Vμ Cμ Vμ	ii. CVG=light					
a. Vμ Cμ Vμ				*!		
☞ b. Vμ C(μ) Vμ						*
c. Vμ Cμ.Vμ		*!		*		
d. Vμ.Cμ Vμ	*!			*		

Geminate vs. Non-geminate

- so far: underlying moraic consonants surface as weight-contributing (17-a) or as non-weight-contributing (17-b)

(17) a. 

b. 

Geminate vs. Non-geminate

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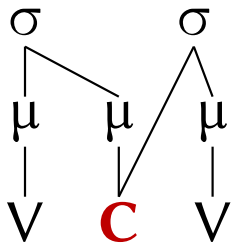
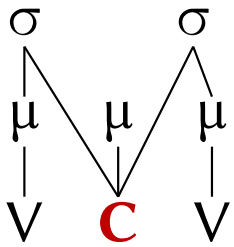


b.



- also possible: **neutralization of geminates to singletons**

Geminate vs. Non-geminate

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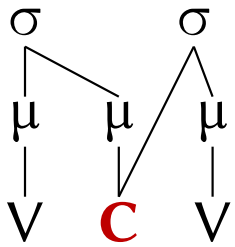
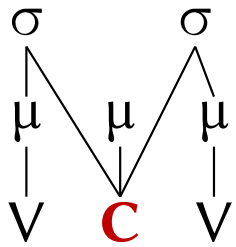
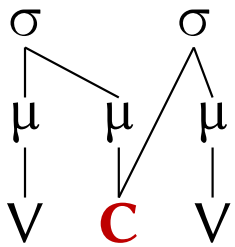
(17) a. 

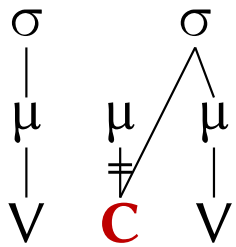
b. 

- also possible: **neutralization of geminates to singletons**

→ the underlying association line to the μ is marked as phonetically invisible (18-b): the C is not doubly linked anymore

(18) *Geminate* *Short consonant*

a. 

b. 

Neutralization of a geminate to a singleton: constraints

(19) a. MAX(μ—S)

Assign * for every phonetically invisible association line between a μ and a segment.

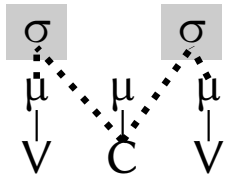
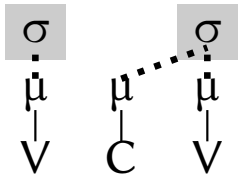
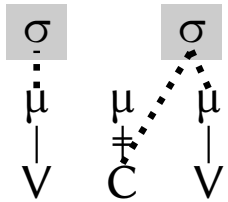
b. ONERT

Assign * for every segment phonetically visibly dominated by more than one root node.

(=prosodic nodes not dominated by another prosodic node)

Neutralization of a geminate to a singleton: tableau

(20)

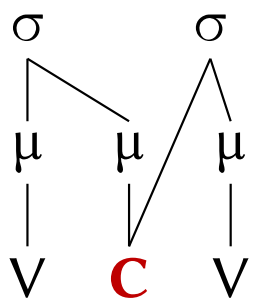
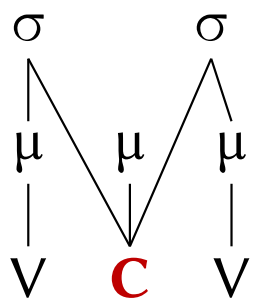
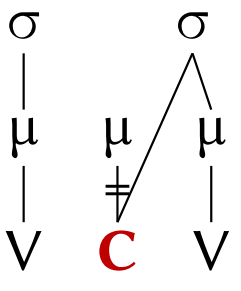
μ μ μ V C V	ONE RT	*σ[C$^{\mu}$	MAX μ—S
a.  [VC:V]	*!		
b.  [V.C:V]		*!	
☞ c.  [V.CV]			*

→ *$_{\sigma}$[C$^{\mu}$ does not enforce ambisyllabicity anymore:
a language without intervocalic geminates

(the structure (20-c) is abbreviated VC$^{((\mu))}$V in the following)

Underlying geminates: predicted surface forms

(21)

abbreviation:	 VC$^{\mu}$V	 VC$^{(\mu)}$V	 VC$^{((\mu))}$V
interpreted as:	C:	C:	C
contributes to σ weight:	yes	no	no
violates:	*C$^{\mu}$	OneRt, Max-μ	Max(μ—S), Max-μ

Initial geminates

Edge geminates

- so far: intervocalic geminates (=by far the most common crosslinguistically)
- geminates at word edges are far less frequent, but existent
  (Thurgood, 1993; Muller, 2001; Davis, 2011; Dimitrieva, 2012; Topintzi and Davis, to appear)

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  (Thurgood, 1993; Muller, 2001; Davis, 2011; Dimitrieva, 2012; Topintzi and Davis, to appear)

→ proposed model easily extends to cases where the question of whether geminates contribute to syllable weight depends on their position

Phonetic interpretation: geminates, revisited

(22) *The phonetic interpretation of geminates*
A consonant can be interpreted as phonetically long iff

a. it is **linked to more than one syllable** or
b. it is phonetically visibly linked to an **μ at the word-edge**.

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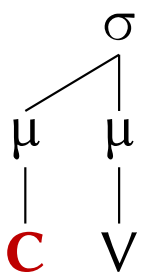
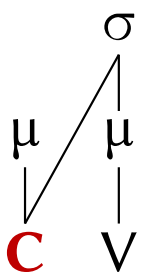
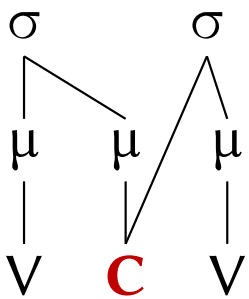
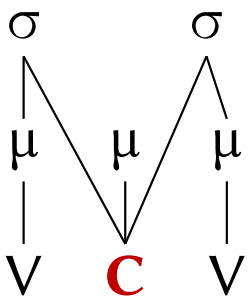
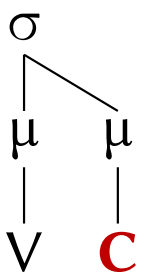
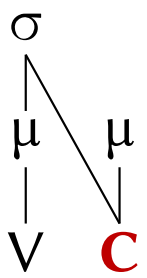
(23) *Possible geminates*

Initial geminates (cf. Kiparsky (2003))		Medial geminates		Final geminates	
a.	b.	c.	d.	e.	f.
					

Initial geminates: Possible outcomes

(24) $^{*}{}_{\omega}[C^{\mu}$

Assign * for every word-initial consonant that is phonetically dominated by a phonetically visible μ.

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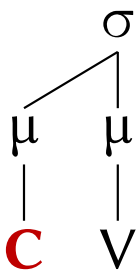
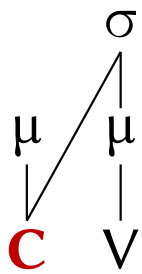
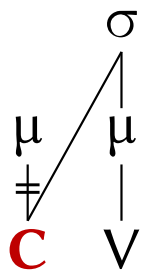
Assign * for every word-initial consonant that is phonetically dominated by a phonetically visible μ.

(25)

			
abbreviation:	$C^{\mu}V$	$C^{(\mu)}V$	$C^{((\mu))}V$
interpreted as:	C:	C:	C
contributes to σ weight:	yes	no	no
violates:	$^{*}C^{\mu}$ $^{*}{}_{\omega}[C^{\mu}$	OneRt, Max-μ	Max(μ—S), Max-μ

Trukese (Hart, 1991; Davis and Torretta, 1998; Davis, 1999*b*)

- all consonants in Trukese except the glides may surface as geminates
- geminates are possible initially and medially and contribute weight (Nouns must be C:V, CV:, or bisyllabic, but CV or CVC nouns are generally impossible)

→ **Initial and medial geminates contribute to syllable weight**

Trukese: tableaux

(26) *Trukese: Initial moraic geminates*

	Ons!	Max μ–s	Dep μ	Max μ	*σ[Cμ	*Cμ	WBP	One Rt
Vμ CCVμ	i. CVC=light							
☞ a. Vμ C.CVμ							*	
b. Vμ Cμ.CVμ			*!			*		
Vμ Cμ Vμ	ii. CVG=heavy							
☞ a. Vμ Cμ Vμ						*		
b. Vμ C(μ) Vμ				*!				*
c. Vμ Cμ.Vμ	*!					*		
d. Vμ.Cμ Vμ					*!	*		
Cμ V	iii. GV=heavy							
☞ a. Cμ V					*	*		
b. C(μ) V				*!	*			*
c. C((μ)) V		*!		*				

Thurgovian Swiss (Muller, 2001; Kraehenmann, 2001, 2003)

- geminates in all positions

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Thurgovian Swiss (Muller, 2001; Kraehenmann, 2001, 2003)

- geminates in all positions
- words must be bimoraic: vowel lengthening for CVC (27-a)
  (=final codas are extrametrical)
- no vowel lengthening for CVG (27-b) but for GVC (27-c)

→ **No weight-contribution for initial geminates but for medial and final ones**

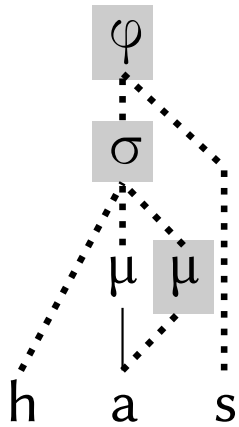
(27) *Word minimality in Thurgovian Swiss (Muller, 2001, 101)*

	Root	Singular	Plural	
a.	/has/	haːs	hase	'hare'
b.	/fɛtː/	fɛtː	fɛtːe	'fat'
c.	/tːak/	tːaːk	tːake	'day'

Word minimality and vowel lengthening in Thurgovian Swiss

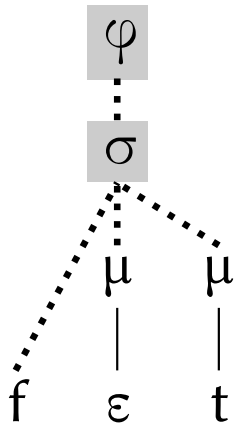
(28)

a. final singleton



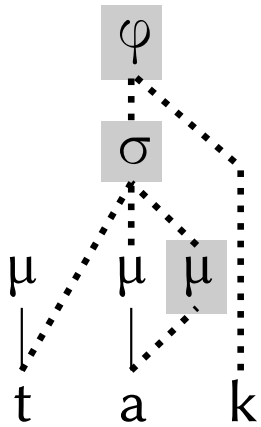
/has/ → [haːs]

b. final geminate



/fɛtː/ → [fɛtː]

c. initial geminate



/tːak/ → [tːaːk]

Thurgovian Swiss: tableaux

(29) *Thurgovian Swiss: Type II with non-moraic initial geminates*

	Ons!	Max μ–S	WBP	*ω[Cμ	*σ[Cμ	Dep μ	Max μ	One Rt	*Cμ
$V^{\mu}CCV^{\mu}$	i. CVC=heavy								
a. $V^{\mu}C.CV^{\mu}$			*!						
☞ b. $V^{\mu}C^{\mu}.CV^{\mu}$						*			*
$V^{\mu}C^{\mu}V^{\mu}$	ii. CVG=heavy								
☞ a. $V^{\mu}C^{\mu}V^{\mu}$									*
b. $V^{\mu}C^{(\mu)}V^{\mu}$							*!	*	
c. $V^{\mu}C^{\mu}.V^{\mu}$	*!								*
d. $V^{\mu}.C^{\mu}V^{\mu}$					*!				*
$C^{\mu}V$	iii. GV=light, geminate								
a. $C^{\mu}V$				*!	*				*
☞ b. $C^{(\mu)}V$					*		*	*	
c. $C^{((\mu))}V$		*!					*		

Hausa, revisited

- Hausa has intervocalic geminates but no initial geminates

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Hausa, revisited

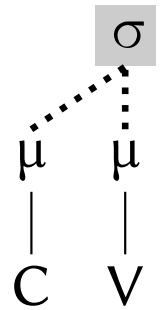
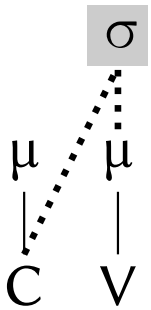
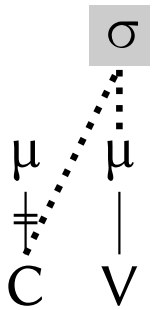
- Hausa has intervocalic geminates but no initial geminates
- intervocalic geminates contribute to σ weight: Max-μ ≫ *C^{μ}
- initial moraic consonants are neutralized to short consonants: *$_{\sigma}[C^{\mu}$ ≫ Max-μ, Max(μ—S)

(30) *Hausa: type III without initial geminates*

	*$_{\sigma}[C^{\mu}$	Ons!	Dep μ	*$_{\omega}[C^{\mu}$	One Rt	Max μ—S	WBP	Max μ	*C^{μ}
$C^{\mu}V^{\mu}$	iii. GV=light, no geminate								
a. $C^{\mu}V$	*!								*
b. $C^{(\mu)}V$	*!							*	
☞ c. $C^{((\mu))}$						*			

Summary: Initial moraic consonants

(31)

	Trukese	Th. Swiss	Hausa
	a. 	b. 	c. 
interpreted as:	[C:V]	[C:V]	[CV]
contributes to syllable weight:	yes	no	no

Summary

Factorial typology (run through OTHelp; cf.Staubs et al. (2010))

(32)

Input:		SinglC VCCV	InitG $C^{\mu}V$		MedG $VC^{\mu}V$		Example
Lgs:	1	W	G	W	G	W	
	2	nW	G	W	G	W	Trukese
	3	W	G	nW	G	W	Th. Swiss
	4	nW	G	nW	G	W	
	5	W	nG	nW	G	W	Latin
	6	nW	nG	nW	G	W	Hausa
	7	W	G	W	G	nW	
	8	nW	G	W	G	nW	
	9	W	G	nW	G	nW	
	10	nW	G	nW	G	nW	
	11	W	nG	nW	G	nW	Ngalakan
	12	nW	nG	nW	G	nW	Selkup
	13	W	G	W	nG	nW	
	14	nW	G	W	nG	nW	Pattani Malay
	15	W	nG	nW	nG	nW	Sentani
	16	nW	nG	nW	nG	nW	Pintupi

G =Geminate
nG =no Geminate
W =contributes weight
nW =no weight

Constraints: Ons!, WbP, $^{*}C^{\mu}$, $^{*}\sigma[C^{\mu}$, $^{*}\omega[C^{\mu}$, OneRt, Dep-μ, Max-μ, Max-μ_{Init}, Max(μ—S)

Summary

- what sets geminates apart from singletons is their **underlying moraicity** (Hayes, 1989; Davis, 1994, 1999*a*, 2003; Topintzi, 2008, 2010)

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  1. **long and weightful**
  2. **long and weightless**
  3. **short and weightless**

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  1. **long and weightful**
  2. **long and weightless**
  3. **short and weightless**
- positional asymmetries follow as well (e.g. geminates in all positions, but only medial and final ones are weightful; initial ones are not as in Th. Swiss)

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