μ-Prefixes and μ-Circumfixes in Dinka

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The Concatenativist Hypothesis

Morphological Exponence = Concatenation + Phonological Alternations

Additive Lengthening in the 3SG (Andersen 1995:16,28)

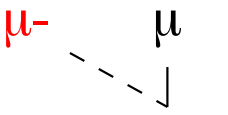
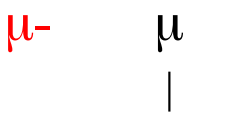
	V	⇒	**Vː**	
a.	wèc	⇒	wèːc	‘kick:3SG’
	tèŋ	⇒	tèːŋ	‘dust:3SG’

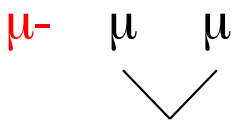
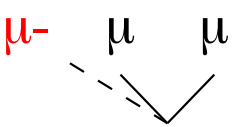
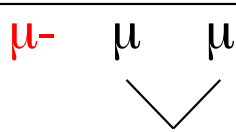
	Vː	⇒	**Vːː**	
b.	lèːr	⇒	lè̤ːːr	‘roll:3SG’
	mìːt	⇒	mì̤ːːt	‘pull:3SG’

Templatic Lengthening in the Benefactive (Andersen 1995:16,28)

	V	⇒	**Vː**		
a.	wéc	⇒	wé̤ːc		‘kick:BEN’
	tèŋ	⇒	tê̤ːŋ		‘dust:BEN’
	Vː	⇒	**Vː**		
b.	lèːr	⇒	lê̤ːr	*lê̤ːːr	‘roll:BEN’
	mìːt	⇒	mî̤ːt	*mî̤ːːt	‘pull:BEN’

Flack's (2007) Analysis of Additive Lengthening (μ = 3SG)

	*$V^{3\mu}_{BEN}$	MAX μ
a. **Input:** 		
☞ a. 		
b. 		*!

	*$V^{3\mu}_{BEN}$	MAX μ
b. **Input:** 		
☞ a. 		
b. 		*!

Flack's (2007) Analysis of Templatic Lengthening (μ = BEN)

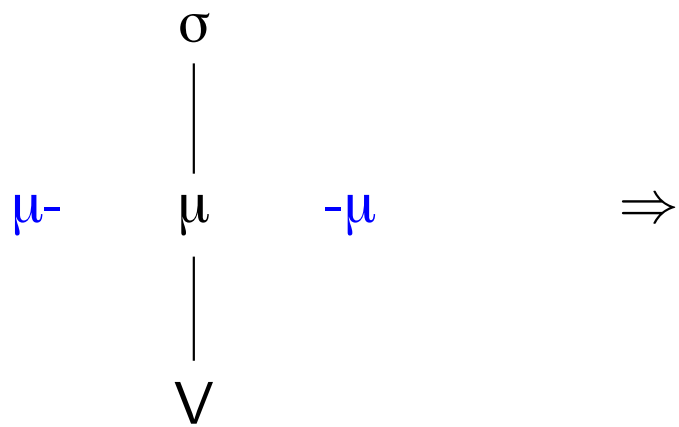
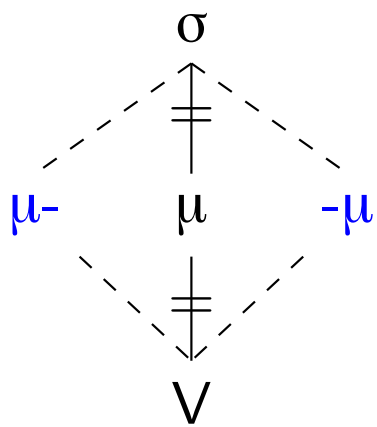
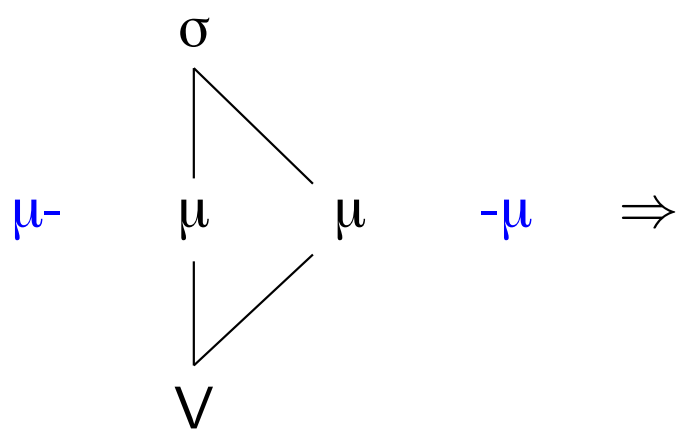
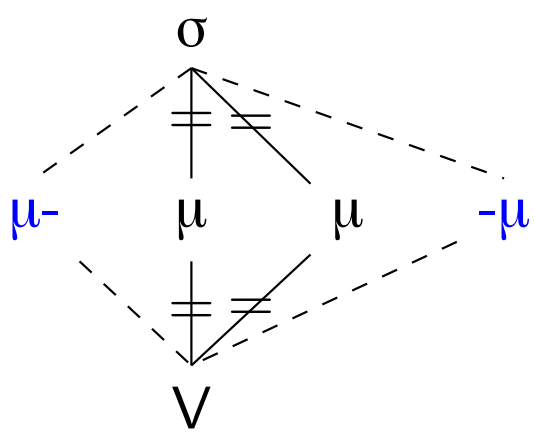
a. **Input:** μ- μ wec	$*V^{3\mu}_{BEN}$	MAX μ
☞ a. μ- μ weːc		
b. μ- μ wec		*!

b. **Input:** μ- μ μ leːr	$*V^{3\mu}_{BEN}$	MAX μ
a. μ- μ μ leːːr	*!	
☞ b. μ- μ μ leːr		*

Claims of this Talk

- Additive Lengthening results from μ-**prefixation**
- Templatic Lengthening results from μ-**circumfixation**
- **Morpheme-specific** directionality of affixation obviates **morpheme-specific** phonology (Flack 2007, Pater 2007)

Templatic Lengthening as Templatic Overwriting

	Input:	**Output:**
1μ-Base		
2μ-Base		

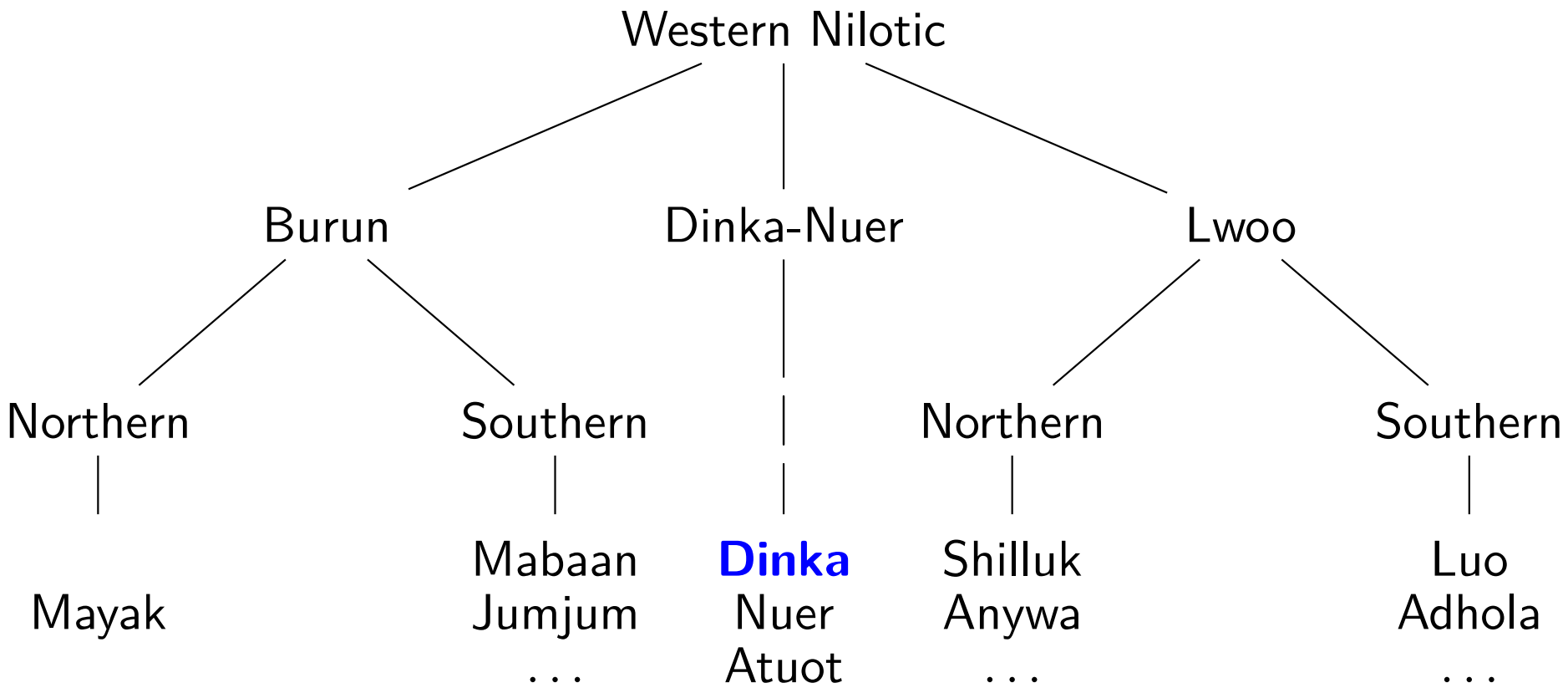
Background

Dinka

Dinka

- Western Nilotic language of the Dinka-Nuer sub-branch
- spoken by more than 2.00.000.000 speakers in Sothern Sudan
- Rich non-concatenative morphology crowded on monosyllabic stems (tone, vowel quality, segmental features of Cs, length)
- All data in this talk from the detailed paper by Anderson (1985)

Western Nilotic Languages



Dinka


Mediterranean Sea
Tunisia
Syria
Iraq
Morocco
Algeria
Libya
مصر
Egypt
Saudi Arabia
Mali
Niger
Chad
Sudan
Burkina Faso
Guinea
Ghana
Nigeria
Ethiopia
Gulf of Guinea
Somalia

Dinka Phonology

- Complex two-tone system (systematically neglected here)
- Three-way vowel-length contrast: V, Vː, Vːː
- Canonical shape of lexical roots: (C)VC
  Canonical shape of suffixes: -(C)V or subsegmental

Theoretical Assumptions

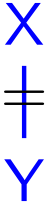
Theoretical Assumptions

- **Autosegmental Containment:** (Prine & Smolensky 1993)
  Underlying material
  is never literally deleted, but retained in the output,
  (but may be marked as phonetically invisible).

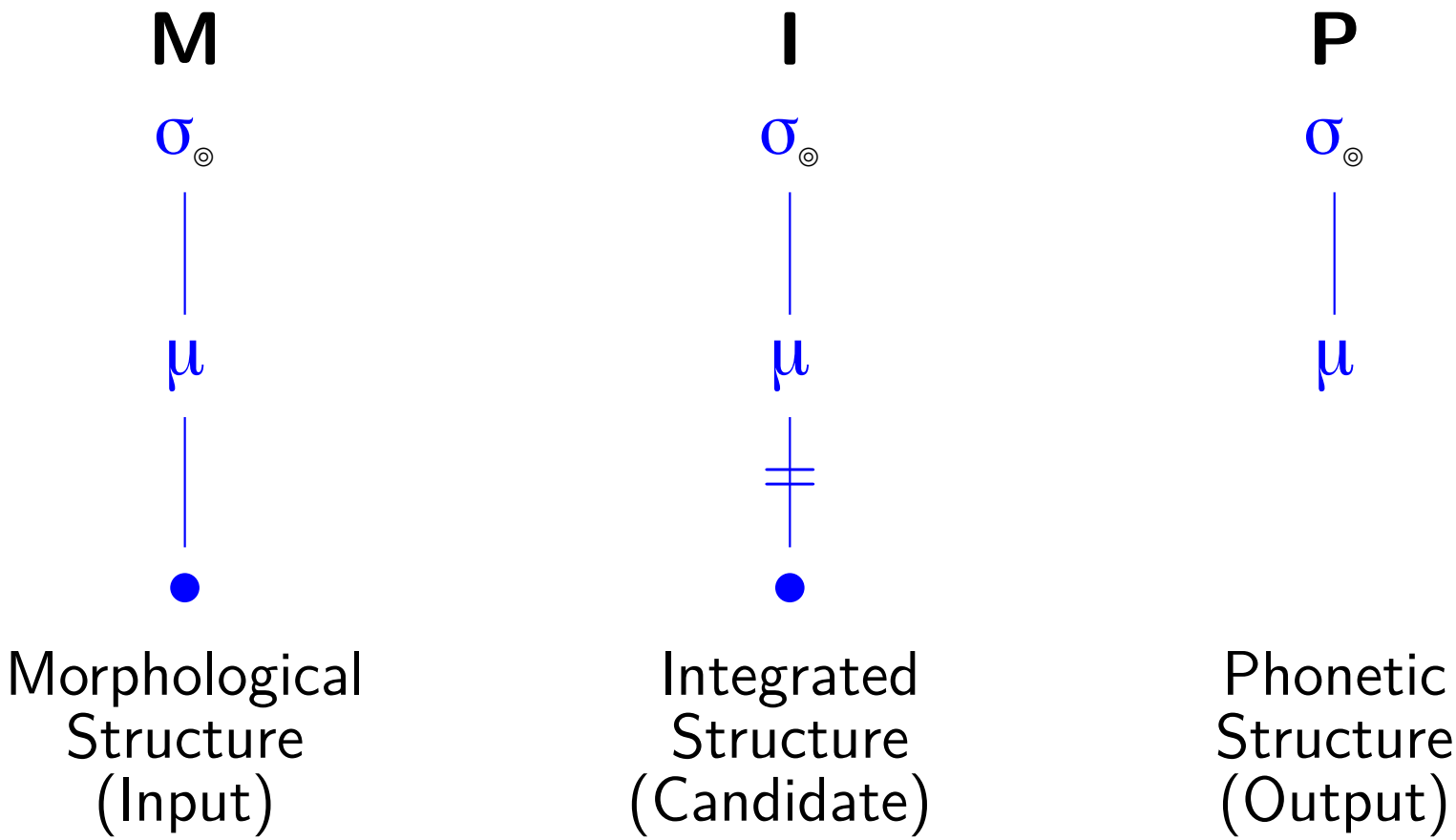
- **Morphological Colors as Phonological Objects:** (van Oostendorp 2006)
  Morphological colors are phonological objects
  on a par with nodes and association lines
  (Non-)Coloring allows to distinguish underlying/epenthetic material

- **Cloning:** (cf. Cloning 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.

Representation of Association Lines (Zimmermann & Trommer 2011)

Morphological association lines		Epenthetic association lines
phonetically visible:	phonetically invisible:	phonetically visible:
		

Deletion

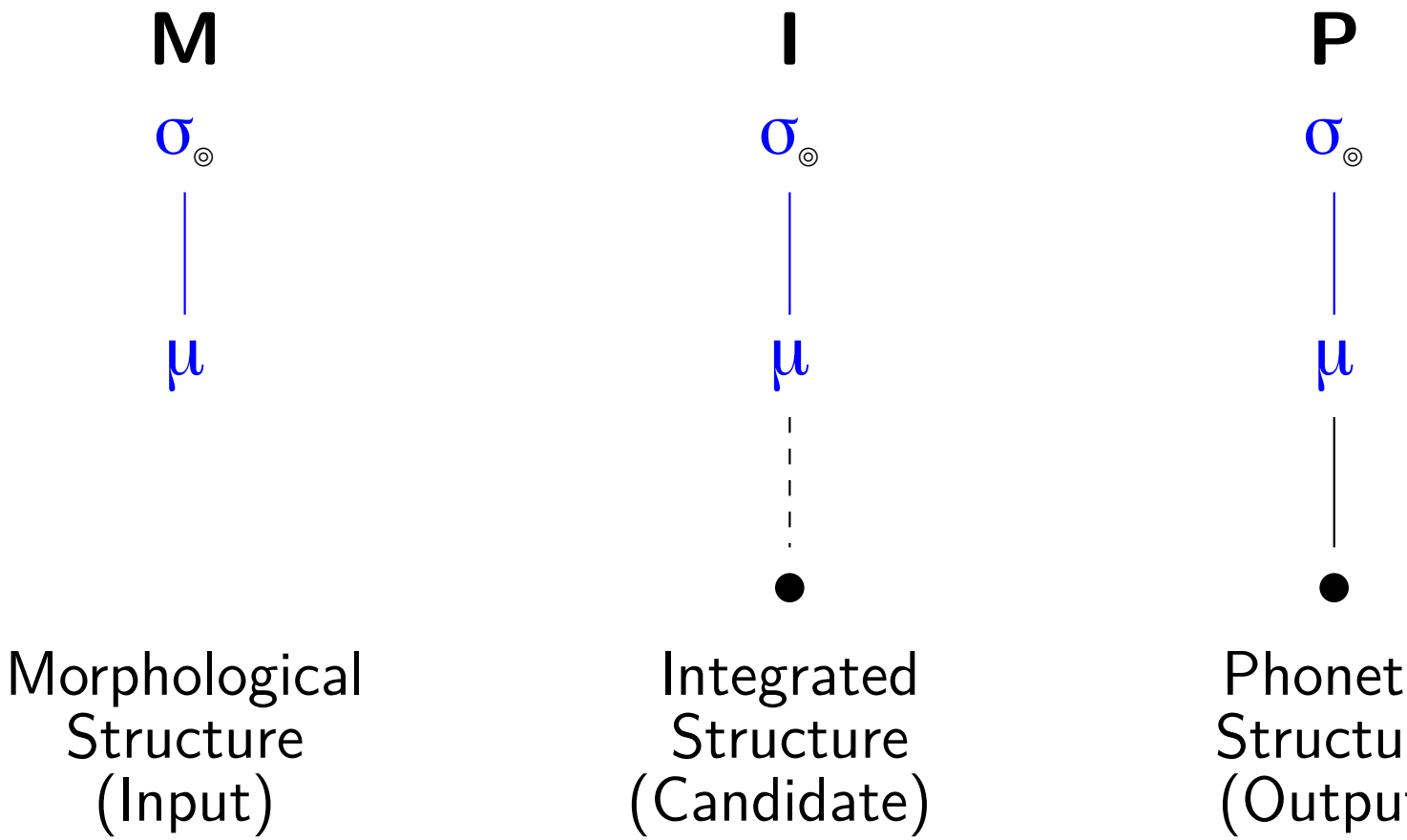


Morphological Structure (Input)

Integrated Structure (Candidate)

Phonetic Structure (Output)

Epenthesis



Morphological Structure (Input)

Integrated Structure (Candidate)

Phonetic Structure (Output)

The Cloning Hypothesis

Every markedness constraint exists in 2 incarnations:

The **general clone** refers to all structure in I

The **phonetic clone** refers only to structure in P

(cf. Cloning in Correspondence Theory, McCarthy & Prince 1995)

Additive Lengthening

Additive Lengthening in the 3SG (Andersen 1995:16,28)

	V	⇒	**Vː**	
a.	wèc	⇒	wèːc	‘kick:3SG’
	tèŋ	⇒	tèːŋ	‘dust:3SG’

	Vː	⇒	**Vːː**	
b.	lèːr	⇒	lè̤ːːr	‘roll:3SG’
	mìːt	⇒	mì̤ːːt	‘pull:3SG’

Additive Lengthening in the Centrifugal (Andersen 1995:16,28)

	V	⇒	**Vː**	
a.	wèc	⇒	wéːc	‘kick:CF’
	tèŋ	⇒	têːŋ	‘dust:CF’

	Vː	⇒	**Vːː**	
b.	lèːr	⇒	lə̂ːːr	‘roll:CF’
	mìːt	⇒	mə̂ːːt	‘pull:CF’

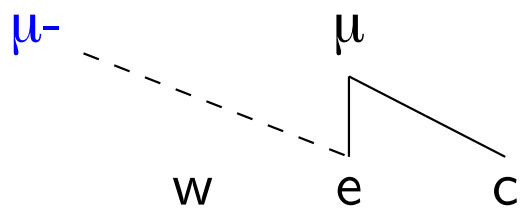
Morphological Exponents

a. 3SG $\leftrightarrow$ μ-

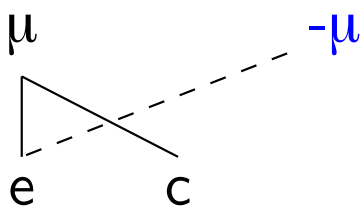
b. Centrifugal $\leftrightarrow$ μ-

Lengthening Exponents are Prefixes, not Suffixes

a.



b. *w



Primitive Constraints on Autosegmental Association

a. $\begin{matrix}\mu \\ \downarrow \\ \bullet\end{matrix}$ Assign $*$ to every mora which does not dominate at least 1 segmental root node in I

b. $\begin{matrix}\sigma \\ \uparrow \\ \mu\end{matrix}$ Assign $*$ to every mora which is not dominated by at least 1 σ-node in I

Faithfulness Constraints on Autosegmental Association

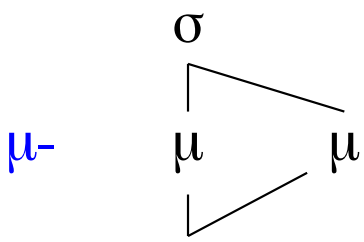
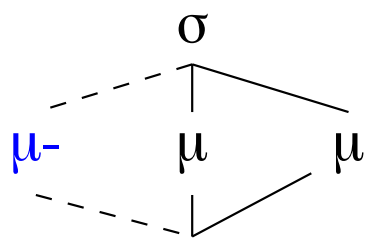
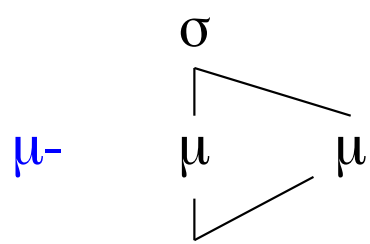
a. $\textsc{Max}^{\mu}_{\uparrow \bullet}$ Assign $*$ to every segment/μ pair which is associated in M but is not associated in P

b. $\textsc{Dep}^{\mu}_{\uparrow \bullet}$ Assign $*$ to every segment/μ pair which is associated in P but is not associated in M

1μ-Prefixation to 1μ-Base (Centrifugal)

		σ↑μ	μ↓●	DEP$^{\sigma}_{\uparrow\mu}$	DEP$^{\mu}_{\uparrow\bullet}$
Input: μ- σ μ V					
☞ a. μ- σ μ V				*	*
b. μ- σ μ V		*!	*!		

1μ-Prefixation to 2μ-Base (Centrifugal)

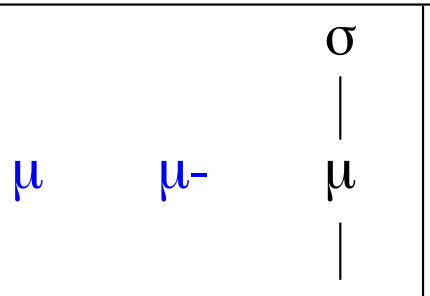
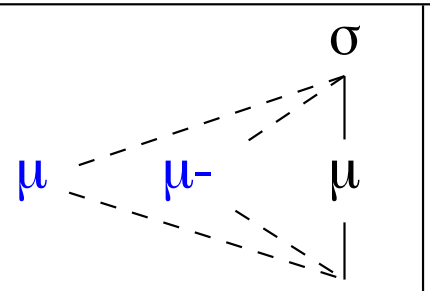
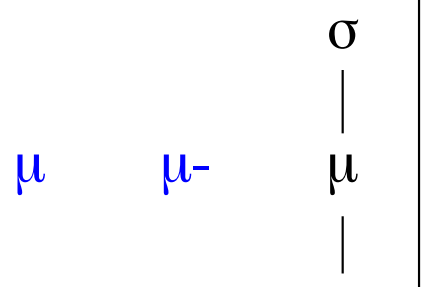
		σ ↑ μ	μ ↓ ●	DEP$^{\sigma}_{\uparrow\ \mu}$	DEP$^{\mu}_{\uparrow\ \bullet}$
Input:					
☞ a.				*	*
b.		*!	*!		

Additive 2-μ-Lengthening in the Causative/Frequentative

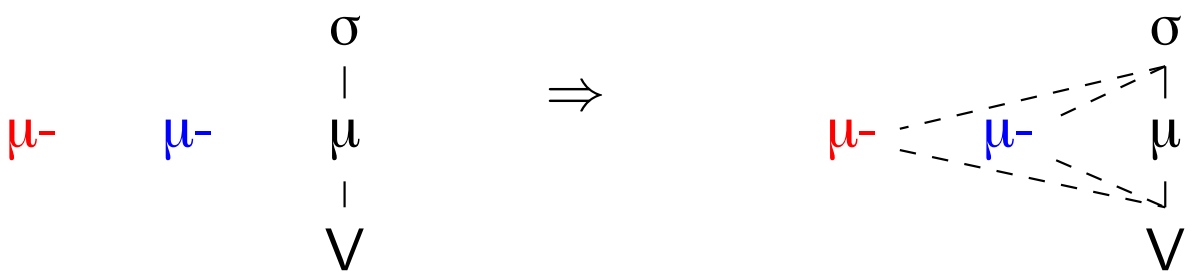
(Andersen 1995:37-38)

	V	⇒	**V꞉꞉**	
a.	bò̩k	⇒	bó̩꞉꞉k	‘throw:FQ’
b.	dɛ̀k	⇒	dɛ̩̂꞉꞉k	‘drink:CAUS’

2μ-Prefixation to 1μ-Base (Causative)

Input: 	σ ↑ μ	μ ↓ •	DEP$^{\sigma}_{\uparrow\ \mu}$	DEP$^{\mu}_{\uparrow\ \bullet}$
☞ a. 			**	**
b. 	*!*	*!*		

Prediction: Cumulative Lengthening under Cumulative Prefixation



Blocking of Cumulative Lengthening in Centrifugal 3SG Forms (Andersen 1995:16,28)

	V			⇒	**Vː**	(**Vːː**)		
a.	wèc	+ μ CF	+ μ 3SG	⇒	wéːc	(*wéːːc)		‘kick:3SG:CF’
	tèŋ	+ μ CF	+ μ 3SG	⇒	têːŋ	(*têːːŋ)		‘dust:3SG:CF’
	Vː			⇒	**Vːː**	(**Vːːː**)		
b.	lèːr	+ μ CF	+ μ 3SG	⇒	lə̂ːːr	(*lə̂ːːːr)		‘roll:3SG:CF’
	mìːt	+ μ CF	+ μ 3SG	⇒	mə̂ːːt	(*mə̂ːːːt)		‘pull:3SG:CF’

Constraints on Moraic Binarity

a. $*V^{3\mu}$ Assign $*$ to every V-node which is dominated by more than two moras in I

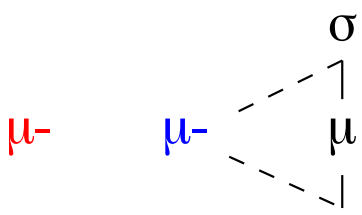
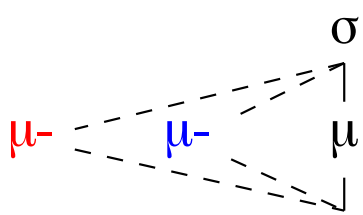
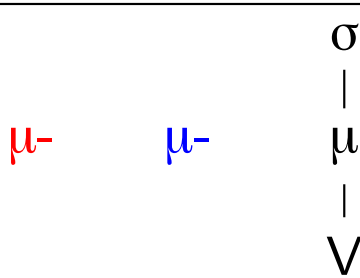
b. $*\sigma_{3\mu}$ Assign $*$ to every σ-node which dominates more than two moras in I

Constraints on Chromatic Binarity

a. $*V^{3\square}$ Assign $*$ to every V which is dominated by (moras of) more than two colors in I

b. $*\sigma_{3\square}$ Assign $*$ to every σ-node which dominates (moras of) more than two colors in I

Blocking of Cumulative Lengthening (Centrifugal + 3SG)

Input: 	$*V^{3\square}$	$*\sigma_{3\square}$	$\sigma \uparrow \mu$	$\mu \downarrow \bullet$	$\text{DEP}^{\sigma}_{\uparrow\mu}$	$\text{DEP}^{\mu}_{\uparrow\bullet}$
☞ a. 					*	*
b. 	*!	*!		*	*	*
c. 			**!	**		

Templatic Lengthening

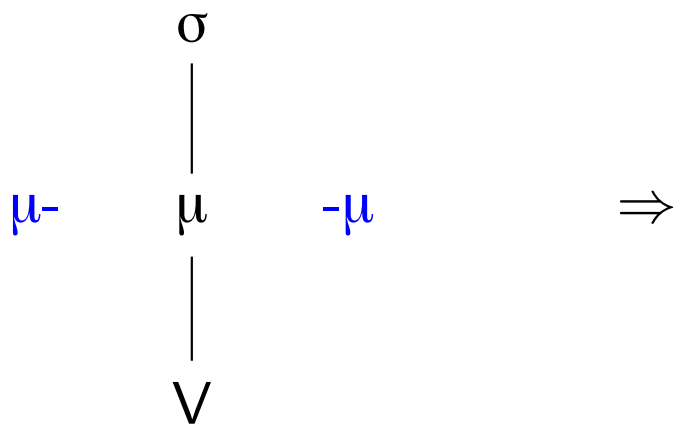
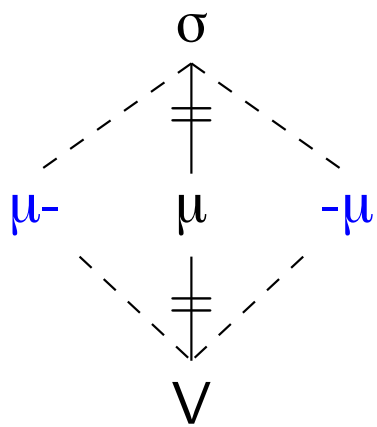
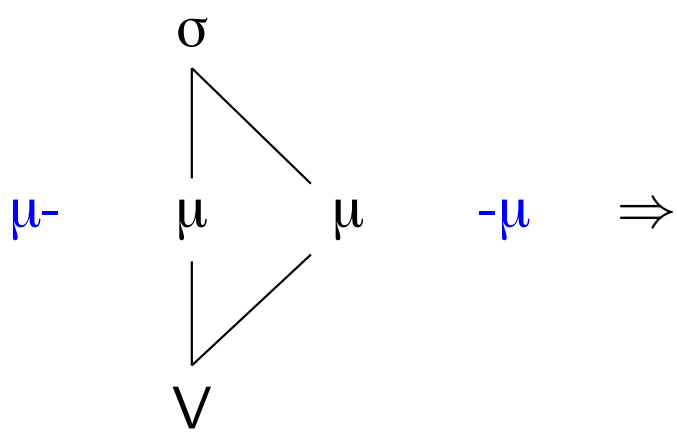
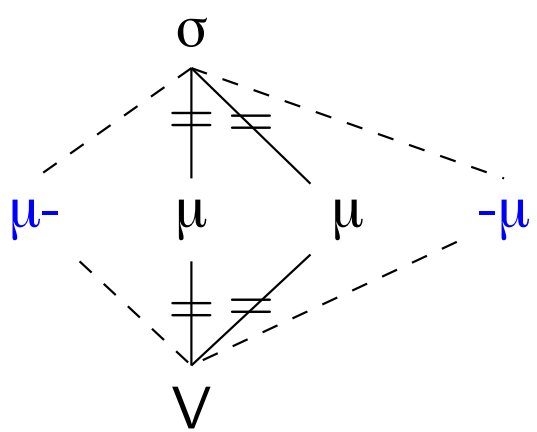
Templatic Lengthening in the Benefactive (Andersen 1995:16,28)

	V	⇒	**V꞉**		
a.	wéc	⇒	wé̤꞉c		‘kick:BEN’
	tèŋ	⇒	tê̤꞉ŋ		‘dust:BEN’
	V꞉	⇒	**V꞉**		
b.	lè꞉r	⇒	lê̤꞉r	*lê̤꞉꞉r	‘roll:BEN’
	mì꞉t	⇒	mî̤꞉t	*mî̤꞉꞉t	‘pull:BEN’

Representation of the Benefactive Exponent

BEN $\leftrightarrow$ μ- -μ

Templatic Lengthening as Templatic Overwriting

	Input:	**Output:**
1μ-Base		
2μ-Base		

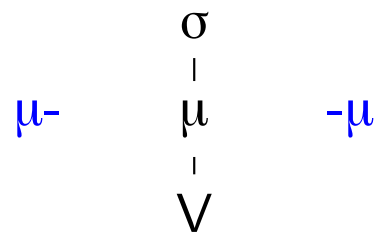
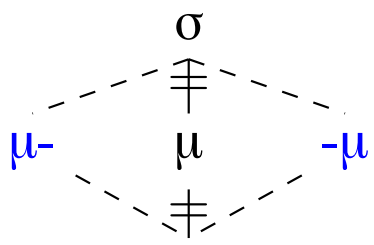
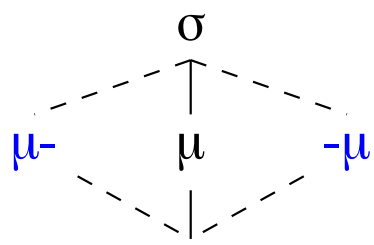
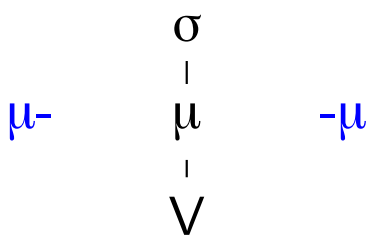
Chromatic μ-Contiguity

□$\underline{\text{CONTIGUITY}_{\mu}}$:

Assign $*$ to every triple of μ-nodes (M_1, M_2, M_3) such that:
(i) $M_1 \prec M_2 \prec M_3$ and
(ii) $\text{Color}(M_1) = \text{Color}(M_3) \neq \text{Color}(M_2)$ in P

(cf. Landman 2003 on Chromatic Contiguity for Segments)

Overwriting by Circumfixation (Benefactive)

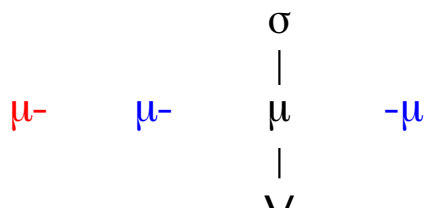
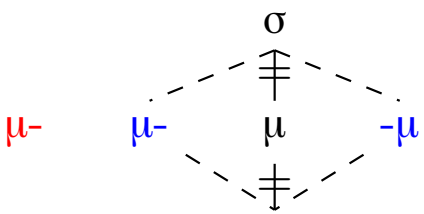
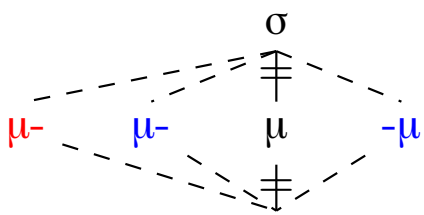
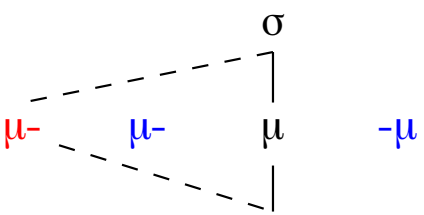
Input: 	□CONT$_{\mu}$	$\sigma \uparrow \mu$	$\mu \downarrow \bullet$	DEP$^{\sigma}_{\uparrow\mu}$	DEP$^{\mu}_{\uparrow\bullet}$	MAX$^{\sigma}_{\uparrow\mu}$	MAX$^{\mu}_{\downarrow\bullet}$
☞ a. 			*	**	**	*	*
b. 	*!			**	**		
c. 		*!*	**				

Templatic Lengthening Blocks Additive Lengthening: Benefactive 3SG Forms (Andersen 1995:16,28)

a.	lèːr	⇒	lə̂ːr		‘roll:BEN’
	lèːr	⇒	lə̀ːːr		‘roll:3SG’
	lèːr	⇒	lə̂ːr	*lə̂ːːr	‘roll:BEN:3SG’
b.	mìːt	⇒	mɪ̂ːt		‘pull:BEN’
	mìːt	⇒	mɪ́ːːt		‘pull:3SG’
	mìːt	⇒	mɪ̂ːt	*mɪ̂ːːt	‘pull:BEN:3SG’

Templatic Lengthening Blocks Additive Lengthening

(3SG = μ-) (Benefactive = μ- -μ)

	*V$^{3\square}$	*$\sigma_{3\square}$	$\square\underline{\text{CONT}}_{\mu}$	σ ↑ μ	μ ↓ •	DEP↑	MAX↑
Input: 							
☞ a. 				*	*	** **	**
b. 	*!	*!				** **	**
c. 				**!	**	* *	

Summary and Prospects

- **The Phonology-Morphology Interface:**
  Phonology needs to distinguish morphemes, not to identify them
  (Flack 2007, Pater 2007)

- **Directionality of Affixation:**
  accounts for crucial differences in otherwise identical
  patterns of non-segmental morphology
  (cf. Anywa vowel shortening/length polarity, Zimmermann & Trommer 2011)

- **Templatic Overwriting:**
  results from circumfixation + CONTGUITY
  (cf. tonal overwriting in Dinka and Hausa, Inkelas & Zoll 2007)

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Overview

1. Background
   - Dinka
   - Theoretical Assumptions
2. Additive Lengthening
   - Additive 1μ-Lengthening
   - Additive 2μ-Lengthening
   - Blocking of Cumulative Lengthening
3. Templatic Lengthening
   - Simple Templatic Lengthening
   - Blocking of Cumulative Lengthening
4. Summary