

# How to linearize weight?

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Phorum

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# Major Theories of Affix Linearization

## Phonological Dislocation

Affixes are prefixes or suffixes to the base, but may infix under the pressure of phonological constraints

(Moravcsik 1977, Prince&Smolensky 1993/2002, Halle 2003, Horwood 2002, Klein 2005)

## Morphological pivot affixation

Affixes are prefixes or suffixes to specific (possibly internal) base positions ('pivots') and cannot be dislocated by phonological processes

(Yu 2002, Yu 2007)

# Tagalog *um*-Infixation

(Bloomfield 1933, McCarthy&Prince 1993, Zoll 1996)

	BASE	ACTOR FOCUS	
(1)	abot	<b>um</b> abot	‘reach for, pf.’
	tawag	<b>tum</b> awag	‘call, pf.’

# Infixation as Affixation+Phonological Dislocation

(Horwood 2002)

(2)  $um \leftrightarrow \text{--- Base}$

(3) *V-initial Base*

um-abot	NoCODA	LIN
☞ a. <b>u.ma</b> .bot	*	
b. a. <b>um</b> .bot	**!	*
c. a. <b>bu</b> .mot	*	*!*

(4) *C-initial Base*

um-tawag	NoCODA	LIN
a. <b>um.ta</b> .wag	**!	
☞ b. <b>tu.ma</b> .wag	*	*
c. ta. <b>um</b> .wag	**!	**

# Infixation as Pivot Affixation

(Yu 2007)

(5) um  $\leftrightarrow$  Base[ ... — V

# Infixation as Pivot Affixation

(Yu 2007)

(5) um ↔ Base [ . . . — V

(6) *Possible pivots for affixation*

a. **Initial pivot**

- (i) First consonant/onset
- (ii) First vowel/nucleus
- (iii) First syllable

b. **Final pivot**

- (i) Final vowel/nucleus
- (ii) Final syllable

c. **Prominence pivot**

- (i) Stressed syllable
- (ii) Stressed vowel/nucleus

## Mora affixation

(7) *Emphatic adjectives in Shizuoka Japanese*

(Davis&amp;Ueda 2006)

	ADJECTIVE	EMPHATIC FORM			
a.	katai	kat <b>a</b> :ai	‘hard’		
	osoi	os <b>o</b> :oi	‘slow’	CV.C̣...	⇒ CV.C̣̄:...
	takai	tak <b>a</b> :ai	‘high’		
b.	hade	hand <b>e</b>	‘showy’		
	ozoi	onz <b>o</b> i	‘terrible’	CV.C̣...	⇒ CVN.C̣...
	nagai	na <b>ng</b> ai	‘long’		
c.	zonzai	zo <b>n</b> :nzai	‘impolite’		
	sup:ai	su <b>u</b> :p:ai	‘sour’	CVC.C...	⇒ CV̄:C.C...
	ok:anai	o <b>k</b> :anai	‘scary’		

# Central Question of this Talk

**How are  $\mu$ -affixes linearized?**



# Linearization of mora affixes

## Phonological Dislocation

The  $\mu$  strives to be a prefix/suffix (morpheme-specific ALIGN/EDGEMOST) but may infix under the pressure of phonological constraints

(SamekLodovici 1992, Grimes 2002, Davis&Ueda 2002)

# Linearization of mora affixes

## Phonological Dislocation

The  $\mu$  strives to be a prefix/suffix (morpheme-specific ALIGN/EDGEMOST) but may infix under the pressure of phonological constraints

(SamekLodovici 1992, Grimes 2002, Davis&Ueda 2002)

## Prosodic Circumscription

Bases can be (recursively) delimited to certain prosodically defined portions and the outparsed portion or the extraprosodic remainder can then be targetted by further operations like prefixation/suffixation.

(Lombardi&McCarthy 1991)

# Our claim

- **$\mu$ -affixation is pivot affixation and any phonological dislocation is excluded**

## 1. Introduction

## 2. A typology of mora affixation

## 3. Against phonological $\mu$ -dislocation

### 3.1 Lack of non-local infixation

### 3.2 Lack of Variable Infixation

### 3.3 Cases of Fixed Infixation: Shizuoka Japanese

### 3.4 Morphologically contrastive $\mu$ -affixes

## 4. Conclusion

# A typology of mora affixation

# Morphological $\mu$ 's

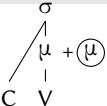
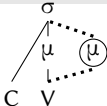
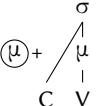
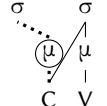
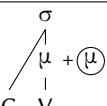
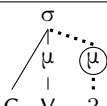
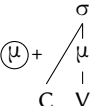
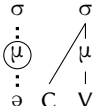
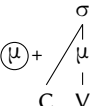
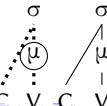
## I. A $\mu$ as morpheme

- (8) *Gidabal* (Geytenbeek&Geytenbeek 1971, Kenstowicz&Kisseberth 1977)
- | BASE |           | IMPERATIVE |
|------|-----------|------------|
| gida | 'to tell' | gida:      |
| ma   | 'to put'  | ma:        |

## II. A $\mu$ is part of a morpheme

- (9) *Plural suffix /-we?/ in Zuni* (Newman 1965, Saba Kirchner 2007)
- | BASE   |                | PLURAL     |
|--------|----------------|------------|
| lupa   | 'box of ashes' | lupa:we?   |
| homata | 'juniper tree' | homata:we? |

Realization of a  $\mu$ -affix

a. <b>Vowel lengthening</b>		
b. <b>Gemination</b>		
c. <b>C-Epenthesis</b>		
d. <b>V-Epenthesis</b>		
e. <b>Reduplication</b>		

# Empirical survey on $\mu$ -affixes: selection criteria

- (10) The set of phonologically predictable allomorphs  $A$  expresses a morphological category  $M$
- a.  **$\mu$ -affixation**  
 Either (i) or (ii) holds:
    - (i) a ‘strictly  $\mu$ -induced’ operation (gemination, vowel lengthening) is one operation in  $A$
    - (ii) at least two different ‘potentially  $\mu$ -induced’ operations (C- or V-epenthesis,  $\mu$ -sized reduplication) are part of  $A$
  - b. **Exclusion of templatic morphology**  
 Not all forms expressing  $M$  through  $A$  conform to a prosodic shape.
  - c. **Relevance for linearization**  
 At least some bases to which  $A$  apply are polysyllabic.



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 Not all forms expressing  $M$  through  $A$  conform to a prosodic shape.
  - c. **Relevance for linearization**  
 At least some bases to which  $A$  apply are polysyllabic.
- 26  $\mu$ -affixation patterns in 24 languages distributed over 19 families

(classification according to AUTOTYP)

<b>Language</b>	<b>Stock</b>	<b>Area</b>	<b>Continent</b>
Shizuoka Japanese	Japanese	N Coast Asia	N-C Asia
Alabama	Muskogean	E North America	EN America
Zuni	Zuni	Basin and Plains	EN America
Lardil	Tangkic	N Australia	Australia
Gidabal	Pama-Nyungan	S Australia	Australia
Arbizu Basque	Basque	Europe	W and SW Eurasia
Slovak	Slavic	Europe	W and SW Eurasia
Hausa	Chadic	African Savannah	Africa
Asante Twi	Kwa	African Savannah	Africa
Luganda	Benue-Congo	S Africa	Africa
Aymara	Jaqui	Andean	S America
Quechua	Quechuan	Andean	S America
Guajiro	Arawakan	NE South America	S America
Southern Sierra Miwok	Yokuts-Utian	California	WN America
Nootka	Wakashan	Alaska-Oregon	WN America
Diegueño	Yuman	California	C America
Saanich	Salishan	Alaska-Oregon	WN America
Upriver Halkomelem	Salishan	Alaska-Oregon	WN America
Hiaki	Uto-Aztecan	Mesoamerica	C America
Shoshone	Uto-Aztecan	Mesoamerica	C America
Tepecano	Uto-Aztecan	Mesoamerica	C America
Tawala	Austronesian	Oceania	NG and Oceania
Keley-i	Austronesian	Oceania	S/SE Asia
Marshallese	Austronesian	Oceania	S/SE Asia

# Where (in their base) are morphological $\mu$ 's realized?

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**doch lieber shoshone?** → on the consonant following the first vowel,  
after the first vowel, or on the first vowel.

(11) *Emphatic adjectives in Shizuoka Japanese*

(Davis&Ueda 2006)

	ADJECTIVE	EMPHATIC FORM	
a.	katai	kat $\mu$ :ai	'hard'
	takai	tak $\mu$ :ai	'high'
b.	hade	han $\mu$ de	'showy'
	nagai	nan $\mu$ gai	'long'
c.	zonzai	zon $\mu$ :nzai	'impolite'
	ok:anai	ok $\mu$ :anai	'scary'

# Where (in their base) are morphological $\mu$ 's realized?

→ on the final vowel.

(12) *Gidabal* (Geytenbeek&Geytenbeek 1971, Kenstowicz&Kisseberth 1977)

BASE		IMPERATIVE
gida	'to tell'	gida:
ma	'to put'	ma:
jaga	'to fix'	jaga:
ga:da-li-wa	'keep on chasing'	ga:daliwa:

	Language	#(C)	V	C	...	C	V	(C)#
1.	Saanich	■	■	■				
2.	Tawala	■	■					
3.	U. Halkomelem	■	■					
4.	Luganda	■						
5.	Marshallese	■						
6.	Keley-i I	■						
7.	Hiaki I		■					
8.	Sh. Japanese		■	■	■			
9.	Tepecano			■				
10.	Keley-i II			■				
11.	Shoshone			■				
12.	Hiaki II			■				
13.	Alabama					■	■	
14.	Arbizu Basque						■	
15.	Gidabal						■	
16.	Zuni						■	
17.	Hausa						■	
18.	Diegeño						■	
19.	Slovak						■	
20.	Nootka						■	
21.	Asante Twi						■	■
22.	Guajiro						■	■
23.	Quechua						■	■
24.	Lardil						■	■
25.	S. Sierra Miwok						■	■
26.	Aymara						■	■

Language(s)	Pivot	Examples
Saanich	#μ__	$\mu(\mu)$ s ə q $\mu(\mu)$ μ μ w e ɾ q ə s $\mu(\mu)$ μ q e q ə n
Tawala	#__μ	$(\mu)\mu$ μ μ t a: t a w a $(\mu)$ μ μ g e g a e
Hiaki I	#__μ	$(\mu)\mu$ μ μ i: v a k t a
U. Halkomelem	#μ__	$(\mu)\mu$ h i l t $(\mu)$ μ μ q i q ə s ə t $(\mu)$ μ h ə m q ə t
Lug., Marsh., Keley-i I	#__μ	$(\mu)\mu$ μ k u b o
Sh. Japanese	#μ__	$\mu(\mu)$ μ h a n d e $\mu(\mu)\mu$ k a t: a i $\mu(\mu)$ μ z o n z a i
Tepecano	#σ__	$\mu(\mu)\mu$ i: p: u r $\mu(\mu)$ μ μ g o ɾ g o c
Shosh., Hiaki II, Keley-i II	#__μ	$\mu(\mu)$ μ j i k: w i
Alabama	__μ#	$\mu(\mu)\mu$ b a l a: $\mu(\mu)\mu$ c o b: a
Gid., Zuni, Hausa, Dieg., Slovak, Nootka	μ__#	$\mu(\mu)$ j a g a:
Asante Twi	μ__#	$\mu(\mu)$ μ μ o b i s a: $\mu(\mu)$ n o m:
Quech., Lard., S.S.Miwok, Aym.	μ__#	$\mu(\mu)$ μ μ j o h k a: $\mu(\mu)$ μ μ μ h a: j a ŋ k i

# $\mu$ -affixation as Pivot Affixation

## Pivots for $\mu$ -affixation

- first/last  $\mu$
- first  $\sigma$

→ they describe all and only the possible landing sites for  $\mu$ -affixes



# Against phonological $\mu$ -dislocation

# Arguments against Phonological $\mu$ -Dislocation

- **Lack of non-local infixation**
- **Lack of Variable Infixation**
- **Cases of Fixed Infixation**
- **Morphologically contrastive  $\mu$ -affixes**

# The general logic of $\mu$ -dislocation approaches

(13) *Long vowels in Gidabal*

gida, $\mu$	*C:	ALIGN( $\mu$ <sub>IMP</sub> , R)	*V:
☞ a. gida $\mu$ [gida:]		*	*
b. gid $\mu$ a [gid:a]	*!	**	

# The general logic of $\mu$ -dislocation approaches

## (13) Long vowels in *Gidabal*

		*C:	ALIGN( $\mu_{IMP}, R$ )	*V:
	gida, $\mu$			
☞ a.	gida $\mu$ [gida:]		*	*
b.	gid $\mu$ a [gid:a]	*!	**	

## (14) Geminate in *Shoshone*

		*#C:	*V:	ALIGN( $\mu_{DUR}, R$ )	*C:
	maka, $\mu$				
a.	m $\mu$ aka [m:aka]	*!			*
b.	ma $\mu$ ka [ma:ka]		*!	*	
☞ c.	mak $\mu$ a [mak:a]			**	*

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# Lack of non-local infixation

- the pivots first/last  $\mu$  and first  $\sigma$  are sufficient to predict all attested cases of  $\mu$ -affixation

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- the pivots first/last  $\mu$  and first  $\sigma$  are sufficient to predict all attested cases of  $\mu$ -affixation
- phonological dislocation accounts inherently predict non-local infixation

(15) *Non-local gemination in unattested Shoshone'*

BASE	$\mu$ -AFFIXED FORM
gadali	gada <i>l</i> :i
pukalimbu	puka <i>l</i> :imbu
sanagumkil	sana <i>g</i> :umkil

# Serious misprediction: non-local infixation

(16) \**Shoshone*'

sanagumkil, $\mu$	*V:	DEPLINK <sub>#<math>\sigma</math></sub>	ALIGN( $\mu$ ,L)	*C:
a. sa $\mu$ nagumkil [sa:nagumkil]	*!	*	*	
b. san $\mu$ agumkil [san:agumkil]		*!	**	*
c. sana $\mu$ gumkil [sana:gumkil]	*!		***	
 d. sanag $\mu$ umkil [sanag:umkil]			****	*



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# A serious misprediction: Shoshone”

- only CV, CVC- syllables are licit
- the leftmost C that can be geminated (not followed by another C), is lengthened

(17) \**Shoshone*”

BASE	$\mu$ -AFFIXED FORM
mataku	mat:aku
mantaku	mantak:u
malkuftika	malkuftik:a

# A serious misprediction: Shoshone”

## (18) Derivation of Shoshone”

			*COMPL	*V:	ALIGN( $\mu$ ,L)	*C:
I.	mataku, $\mu$					
	a.	ma $\mu$ ta.ku	[mat:aku]		*!	*
	☞ b.	mat $\mu$ a.ku	[mat:aku]			**
						*
II.	mantaku, $\mu$					
	a.	ma $\mu$ n.tan.ku	[ma:ntaku]		*!	*
	b.	man $\mu$ ta.ku	[man:taku]	*!		**
	☞ c.	mantak $\mu$ u	[mantak:u]			*****
						*
III.	malkuftika, $\mu$					
	a.	ma $\mu$ l.kuf.ti.ka	[ma:lkuftika]		*!	*
	b.	mal $\mu$ kuf.ti.ka	[mal:kuftika]	*!		**
	c.	mal.kuf $\mu$ ti.ka	[malkuf:tika]	*!		*****
	☞ d.	mal.kuf.tik $\mu$ a	[malkuftik:a]			*****
						*

## ...but isn't Keley-i such a language?

### Samek-Lodovici (1992):

'Gemination is caused by random affixation of a moraic morpheme. A very simple set of independently motivated constraints determines its eventual location and what segment is involved.' (p.8)

# Gemination in Keley-i

Hohulin (1971), Hohulin&Kenstowicz (1979), Archangeli (1987), Lombardi&McCarthy (1991)

- three tenses (Prs, Pst, Fut) and five foci

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gemination of the leftmost consonant that can be geminated in the Prs+Fut (=non-perfect)

(19) *Non-perfect gemination*

(Hohulin&Kenstowicz 1979)

ACCESS.FOCUS	BEN.FOC		
$\text{ʔi-p:ili}$	$\text{ʔi-p:ili-ʔan}$		
$\text{ʔi-d:ujag}$	$\text{ʔi-d:ujag-an}$		
SUBJ.FOCUS	OBJ.FOCUS	REF.FOC	
$\text{um-pil:i}$	$\text{pil:i-ʔen}$	$\text{pil:i-ʔan}$	
$\text{um-duj:ag}$	$\text{duj:ag-en}$	$\text{duj:ag-an}$	

# Analysis for Keley-i in Samek-Lodovici (1992)

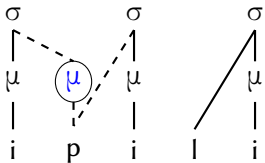
- left-edge proximity for the affix
- syllabic wellformedness: only CV/CVC are licit



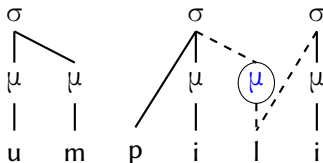
# Analysis for Keley-i in Samek-Lodovici (1992)

- left-edge proximity for the affix
- syllabic wellformedness: only CV/CVC are licit

## *i. Initial gemination*



## *ii. Medial gemination*



# Gemination in Keley-i I

(20) *Non-perfect root-initial gemination*

(Hohulin&Kenstowicz 1979)

	ACCESS.FOCUS	BEN.FOC	
FUT	ʔi- <b>p</b> :ili	ʔi- <b>p</b> :ili-ʔan	
PAST	ʔim-pili	ʔim-pili-ʔan	‘to choose’
PRES	ke-ʔi- <b>p</b> :ili	ke-ʔi- <b>p</b> :ili-ʔi	
FUT	ʔi- <b>d</b> :ujag	ʔi- <b>d</b> :ujag-an	
PAST	ʔin-dujag	ʔin-dujag-an	‘to pour’
PRES	ke-ʔi- <b>d</b> :ujag	ke-ʔi- <b>d</b> :ujag-i	

# Gemination in Keley-i II

(21) *Non-perfect root-medial gemination*

(Hohulin&Kenstowicz 1979)

	SUBJ.FOCUS	OBJ.FOCUS	REF.FOC	
FUT	um-pi <i>l</i> :i	pi <i>l</i> :i-ʔen	pi <i>l</i> :i-ʔan	
PAST	p-imɜ:ili	p-in-ili	p-in-ili-ʔan	‘to choose’
PRES	ka-ʔum-pi <i>l</i> :i	ke-pi <i>l</i> :i-ʔa	ke-pi <i>l</i> :i-ʔi	
FUT	um-du <i>j</i> :ag	du <i>j</i> :ag-en	du <i>j</i> :ag-an	
PAST	d-imɜ:ujag	d-in-ujag	d-in-ujag-an	‘to pour’
PRES	ka-ʔum-du <i>j</i> :ag	ka-du <i>j</i> :ag	ka-du <i>j</i> :ag-i	

# Morphological analysis for Keley-i

	Focus				
	Access.	Ben.	Sbj.	Obj.	Ref.
<b>Pst</b>					
<b>Prs</b>	$\text{?i-}$	$\text{?i-}$	$\text{?um-}$	$\text{ke-}$	$\text{ke-}$
<b>Fut</b>	$\text{?i-}$	$\text{?i-}$	$\text{?um-}$		

**initial G.**   **medial G.**

→ partially complementary distribution of initial/medial  $\mu$ -affixation

# Morphological analysis for Keley-i

	Focus					stative
	Access.	Ben.	Sbj.	Obj.	Ref.	
<b>Pst</b>						$\text{?i-}$
<b>Prs</b>	$\text{?i-}$	$\text{?i-}$	$\text{?um-}$	$\text{ke-}$	$\text{ke-}$	$\text{?i-}$
<b>Fut</b>	$\text{?i-}$	$\text{?i-}$	$\text{?um-}$			$\text{?i-}$

initial G.    medial G.

- partially complementary distribution of initial/medial  $\mu$ -affixation
- **but:** both gemination patterns cooccur in the stative paradigm

# Morphological analysis for Keley-i

	Focus					stative
	Access.	Ben.	Sbj.	Obj.	Ref.	
<b>Pst</b>						ʔi-
<b>Prs</b>	ʔi-	ʔi-	ʔum-	ke-	ke-	ʔi-
<b>Fut</b>	ʔi-	ʔi-	ʔum-			ʔi-

initial G.

medial G.

- partially complementary distribution of initial/medial  $\mu$ -affixation
- **but**: both gemination patterns cooccur in the stative paradigm

(22) *Initial and medial gemination in Keley-i* (Hohulin&Kenstowicz 1979)

	<b>Pst</b>		<b>Prs</b>		<b>Fut</b>
bitu	'to put'	ne-ʔi-bitw-an	ke-ʔi- <b>bit</b> :u-ʔan		me-ʔi- <b>bit</b> :u-ʔan

# Morphological analysis for Keley-i

**There are two  $\mu$ -affixes!**

# Morphological analysis for Keley-i

## There are two $\mu$ -affixes!

I.  $\mu / [\_ \mu \leftrightarrow [-\text{pst}, \text{Access} \vee \text{Ben} \vee \text{Stat}]$

II.  $\mu / [\sigma \_ \_ \leftrightarrow [-\text{pst}, \text{Sbj} \vee \text{Obj} \vee \text{Ref} \vee \text{Stat}]$



# Arguments against Phonological $\mu$ -Dislocation

- **Lack of non-local infixation**
- **Lack of Variable Infixation**
- **Cases of Fixed Infixation**
- **Morphologically contrastive  $\mu$ -affixes**

## Shizuoka Japanese

(23) *Emphatic adjectives in Shizuoka Japanese*

(Davis&amp;Ueda 2006)

	ADJECTIVE	EMPHATIC FORM			
a.	katai	kat <b>ɪ</b> :ai	‘hard’		
	osoi	o <b>s</b> :oi	‘slow’	CV.C̣...	⇒ CV.C̣:...
	takai	tak <b>ɪ</b> :ai	‘high’		
b.	hade	hand <b>e</b>	‘showy’		
	ozoi	o <b>n</b> zoi	‘terrible’	CV.C̣...	⇒ CVN.C̣...
	nagai	na <b>ŋ</b> gai	‘long’		
c.	zonzai	zo <b>n</b> :nzai	‘impolite’		
	sup:ai	su <b>ɸ</b> :p:ai	‘sour’	CVC.C...	⇒ CV:C.C...
	ok:anai	o <b>k</b> :anai	‘scary’		

## Shizuoka Japanese in Davis &amp; Ueda (2006)

(24) *CVQV*


katai, $\mu$	$\sigma$ -COND	*V:	DEP n	*C:
☞ a. kat $\mu$ ai [kat:ai]				*
b. ka n $\mu$ tai [kantai]			*!	
c. ka $\mu$ tai [ka:tai]		*!		

(25) *CVQV*

hade, $\mu$	$\sigma$ -COND	*V:	DEP n	*C:
a. had $\mu$ e [had:e]		*C:	*	*
☞ b. ha n $\mu$ de [hande]			*	
c. ha $\mu$ de [ha:de]		*!		

## Shizuoka Japanese in Davis &amp; Ueda (2006)

(26) CVN.OV

zonzai, $\mu$		$\sigma$ -COND	*V:	DEP n	*C:
a. zonz $\mu$ ai [zon.z:ai]		* $_{\sigma}$ [C $\mu$ !]	*		*
b. zon n $\mu$ zai [zon:zai]		*CC] $_{\sigma}$ !		*	
 c. zo $\mu$ nzai [zo:n.zai]			*		

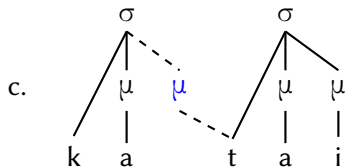
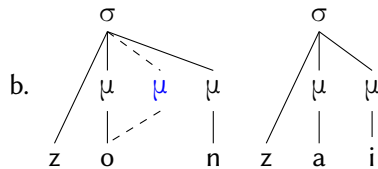
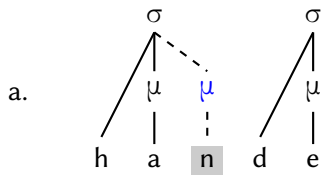
# Sh. Japanese Linearization by Pivot Affixation

(27)  $\mu \leftrightarrow \text{Base}[\mu \text{ —}]$

## Sh. Japanese Linearization by Pivot Affixation

(27)  $\mu \leftrightarrow \text{Base}[\mu \text{ —}]$ 



(28)




# Shizuoka Japanese as a Problem for Dislocation

ALIGN( $\mu$ ,L) must be ranked below \*V: to allow  $\mu$ -metathesis in n-epenthesis

(29) *Wrong ranking for CVQV*

hade, $\mu$	$\sigma$ -COND	ALIGN( $\mu$ ,L)	*V:	DEP n	*C:
a. had $\mu$ e (had:e)	* $\underline{C}$ :	**	*		*
 b. ha n $\mu$ de (hande)		*!*		*	
 c. ha $\mu$ de (ha:de)		*	*		

(30) *Correct ranking for CVQV*

hade, $\mu$	$\sigma$ -COND	*V:	ALIGN( $\mu$ ,L)	DEP n	*C:
a. had $\mu$ e [had:e]	* $\underline{C}$ :	*	**		*
 b. ha n $\mu$ de [hande]			**	*	
c. ha $\mu$ de [ha:de]		*!	*		

# Shizuoka Japanese as a Problem for Dislocation

ALIGN( $\mu$ ,L) must be ranked above \*V: to block gemination beyond the first  $\sigma$

(31) *Wrong ranking for CVN.OV*

kata, $\mu$		$\sigma$ -COND	*V:	ALIGN( $\mu$ ,L)	DEP n	*C:
a. onz $\mu$ okutai	[on.z:okutai]	* $\sigma$ [C $\mu$ !]		**		*
☛ a'. onzok $\mu$ utai	[on.zok:utai]			****		*
b. on n $\mu$ zai	[on:zokutai]	*CC] $\sigma$ !		*	**	
☞ c. o $\mu$ nzokutai	[o:n.zokutai]		*			

(32) *Correct ranking for CVN.OV*

kata, $\mu$		$\sigma$ -COND	ALIGN( $\mu$ ,L)	*V:	DEP n	*C:
a. onz $\mu$ okutai	[on.z:okutai]	* $\sigma$ [C $\mu$ !]	**	*		*
a'. onzok $\mu$ utai	[on.zok:utai]		*!****			*
b. on n $\mu$ zai	[on:zokutai]	*CC] $\sigma$ !	**		*	
☞ c. o $\mu$ nzokutai	[o:n.zokutai]			*		



## $\mu$ -Alignment in Davis & Ueda (2006:4)

(33) ALIGN-L( $\mu_e$ , Wd)

Align the emphatic mora with the beginning (left edge) of the word.

“In our analysis, the evaluation of the alignment constraint in (5) is with respect to the syllable so that if the emphatic mora ( $\mu_e$ ) is realized in the first syllable of the word then the constraint is satisfied; it is violated if it is realized beyond the first syllable.”

# Arguments against Phonological $\mu$ -Dislocation

- Lack of non-local infixation
- Lack of Variable Infixation
- Cases of Fixed Infixation
- **Morphologically contrastive  $\mu$ -affixes**

# Moraic Distinctiveness

- different  $\mu$ -affixes in the same language result in different outputs  
(Guerssel&Lowenstamm 1990, Lowenstamm 2003)

(34) *Binyanim in Classical Arabic* (McCarthy 1979, McCarthy&Prince 1990)

	'write'	'do'
BINYAN I	katab	faʔal
BINYAN II	kat:ab	faʔ:al
BINYAN III	ka:tab	fa:ʔal

# Problem for the Dislocation Approach

If both Binyanim are  $\mu$ -prefixes

they should infix in exactly the same way

# Classical Arabic under pivot-affixation

(35) *Two  $\mu$ -affixes in Classical Arabic*

Binyan II  $\leftrightarrow \mu / [\mu \_ \_$  (Gemination)

Binyan III  $\leftrightarrow \mu / [\_ \_ \mu$  (Vowel lengthening)

(36) *Binyan II: Gemination*

Input: = a.	* $\times$	$\sigma$ $\uparrow$ $\mu$	$\mu$ $\rightarrow$ $\bullet$	*V:																				
a. <table style="margin-left: 40px; border-collapse: collapse;"> <tr> <td></td> <td style="text-align: center;"><math>\sigma</math></td> <td></td> <td style="text-align: center;"><math>\sigma</math></td> </tr> <tr> <td></td> <td style="text-align: center;"> </td> <td></td> <td style="text-align: center;"> </td> </tr> <tr> <td></td> <td style="text-align: center;"><math>\mu</math></td> <td style="text-align: center;"><math>-\mu</math></td> <td style="text-align: center;"><math>\mu</math></td> </tr> <tr> <td></td> <td style="text-align: center;"> </td> <td></td> <td style="text-align: center;"> </td> </tr> <tr> <td style="text-align: right;">k</td> <td style="text-align: center;">a</td> <td style="text-align: center;">t</td> <td style="text-align: center;">a</td> </tr> </table>		$\sigma$		$\sigma$						$\mu$	$-\mu$	$\mu$					k	a	t	a		*!	*	
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(37) *Binyan III: Vowel Lengthening*

Input: = a.	* $\times$	$\sigma$ $\uparrow$ $\mu$	$\mu$ $\leftarrow$ $\bullet$	* $V:$																				
a. $\mu^-$ <table style="display: inline-table; vertical-align: middle; margin-left: 20px;"> <tr><td></td><td><math>\sigma</math></td><td></td><td><math>\sigma</math></td></tr> <tr><td></td><td> </td><td></td><td> </td></tr> <tr><td></td><td><math>\mu</math></td><td></td><td><math>\mu</math></td></tr> <tr><td></td><td> </td><td></td><td> </td></tr> <tr><td></td><td>k a</td><td>t</td><td>a</td></tr> </table>		$\sigma$		$\sigma$						$\mu$		$\mu$						k a	t	a		*!	*	
	$\sigma$		$\sigma$																					
	$\mu$		$\mu$																					
	k a	t	a																					
b. $\mu^-$ <table style="display: inline-table; vertical-align: middle; margin-left: 20px;"> <tr><td></td><td><math>\sigma</math></td><td></td><td><math>\sigma</math></td></tr> <tr><td></td><td> </td><td></td><td> </td></tr> <tr><td></td><td><math>\mu</math></td><td></td><td><math>\mu</math></td></tr> <tr><td></td><td> </td><td></td><td> </td></tr> <tr><td></td><td>k a</td><td>t</td><td>a</td></tr> </table>		$\sigma$		$\sigma$						$\mu$		$\mu$						k a	t	a				*
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# Conclusion

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  - fail to predict instances of Fixed Infixation without additional (stipulated) machinery

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- $\mu$ -affixation is pivot-affixation
- phonological dislocation theories:
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  - predict unattested instances of variable  $\mu$ -infixation
  - fail to predict instances of Fixed Infixation without additional (stipulated) machinery
  - fail to predict morphologically contrastive  $\mu$ -affixes in one language

## 1. Introduction

## 2. A typology of mora affixation

## 3. Against phonological $\mu$ -dislocation

### 3.1 Lack of non-local infixation

### 3.2 Lack of Variable Infixation

### 3.3 Cases of Fixed Infixation: Shizuoka Japanese

### 3.4 Morphologically contrastive $\mu$ -affixes

## 4. Conclusion

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