

## Unrecoverable Origins\*

### I. Background

It has generally been claimed that ranked constraint analyses can handle data as well as derivational analyses can, but without the use of rule ordering. However, there is data that remains intractable to analysis within an OT-type framework precisely because ordering is crucial in arriving at surface forms. Counterfeeding order is problematic in this regard.

(1) Chukchee (Krause 1979)

- a. /kC/ → [ɣC]<sup>1</sup>
- b. /ɣ Lab/ → [w Lab]
- c. /km/ → [ɣm] (\*wm)

Constraints: -No Preconsonantal *k* (No *kC*)  
 -No Sequence of a Velar Continuant before a Labial (No VelCont\_Lab)

(2)

km	No <i>kC</i>	No Velar Cont-Lab Sequence
km	*	
ɣm		*
☞ *wm		

In this kind of counterfeeding order, in which the underlying features must be distinguished from derived features, the problem can be dealt with by referring specifically to the underlying nature of the feature. Thus, if the constraint against a sequence consisting of a velar continuant before a labial is modified such that it is specifically a velar with an underlying continuant feature that cannot occur before a labial, then *ɣm* in the tableau no longer incurs a violation. However, this approach will not work when the counterfeeding involves derived features which must be distinguished according to which process they were derived by.

- a. **Suma:** Gbaya language of Adamawa-Ubangi subfamily of Niger-Congo family; spoken in Central African Republic.

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\* I'd like to thank Namgbei, Joel for information on the Suma language and Dave Odden for helpful comments and discussion.

<sup>1</sup> Forms like *ekak* 'son' make it clear that this is not a constraint against coda *k*.

**b. Tone System** (from Bradshaw, 1995)

(3)		H	M	L
	upper	+	+	-
	raised	+	-	-

- (4) Default Rules: [ ] → -raised  
 [ ] → -upper

**II. Associative Construction**

**a. Description:**

- consists of head noun and following complement in NP
- expresses the idea ‘X of Y’
- uses include: inalienable possession  
 ‘which X’ [gèé]

**b. Tone Alternation in toneless nouns**

- tone alternations affect head noun
- no alternations when final tone is M or H (underlining = nasalization)

(5)	nú	‘mouth’	nú Bōnàm	‘Bonam’s mouth’
	zí	‘fly’	zí gòrò	‘honey fly (ie. bee)’
	yéré	‘basket’	yéré gèdà	‘basket of manioc’
	sára	‘spine’	sára nú	‘whiskers (of mouth)’
	zàká	‘horn’	zàká sàdè	‘animal horn’
	běy	‘person’	běy àlà	‘person of suffering’

(6)	mbārā	‘money’	mbārā zòrò	‘price of fish’
	gūn	‘waist’	gūn bĕy	‘waist of person’
	kōy	‘remains’	kōy kām	‘leftover food’
	dōō	‘wine’	dōō mbúru	‘palm wine’
	mbōŋgō	‘top of head’	mbōŋgō tān bĕy	‘top of person’s head’

- Final L’s raise to M

(7)	rì	‘water’	rì bĕrè	‘breast milk’
	bĕrè	‘breast’	bĕrè bágàrà	‘cow’s teat’
	wò	‘hunger’	wò sàdè	‘hunger for meat’
	sàà	‘game’	sāā bĕm	‘children’s game’
	ḃàà	‘arm’	ḃāā bĕy	‘person’s arms’
	tàn	‘head’	tān Bōnàm	‘Bonam’s head’
	tĕn	‘thorn’	tĕn tē	‘tree thorn’
	nĭk	‘tendons’	nĭk gĕé	‘tendons of neck’

zàŋ	'insides'	zāŋ	Bōnàm	'Bonam's insides'
màrà	'tail'	mārā	sàdē	'animal's tail'
gbàrà	'hard part'	gbārā	kùrà	'arrow-head'

(8)	ó nē rì gèé	'which water is it?'	from rì	'water'
	ó nē wèn gèé	'which dispute is it?'	from wèn	'word, dispute'
	ó nē bēre gèé	'which breast is it?'	from bēre	'breast'
	ó nē dūwā gèé	'which goat is it?'	from dūwā	'goat'
	ó nē gōrō gèé	'which honey is it?'	from gōrō	'honey'

- Noninitial L raises to M in nouns of more than 2 moras

(9) LLL → LMM (\*MMM)

[yàwùndà]	yàwùndū gèé	which red peanut?
[sèrèŋgè]	sèrèŋgē gèé	which bee-feater bird?

(10) LLLL → LMMM (\*MMMM)

[yàmàndiyò]	yàmàndiyō gèé	which red peanut?
[dòkòdílè]	certain caterpillar	(Note: [dòk] 'caterpillar')
	dòkòdīlē gèé	which caterpillar
[àkàdèrè]	àkādērē gèé	which toad

**c. Tone alternation in nouns with an underlying H**

- Final L raises to H when preceded by H (HL → HH)

(11)	kpánà	'pot, jar'	kpáná rì	'water jar'
	kpárè	'seeds for sowing'	kpáré fón	'millet seeds'
	bólò	'pouch'	bóló nāŋá	'animal skin pouch'
	kúrì	'egg'	kúrí gǒk	'serpent's egg'
	ndìŋ	'dirt, filth'	ndìŋ wèn	'foul language'
	súbè	'stomach contents'	súbé ndārā	'contents of buffalo's stomach'

(12)	ó nē kpáná gèé	'Which pot is it?'
	ó nē kpáré gèé	'Which sowing seeds are they?'

- H fails to spread in nouns of more than 2 moras

(13) LHL → LHM (\*LHH)

[ŋgàálà]	'ctn. plant'	ŋgàálā gèé	which plant?
[sìlì]	'ctn. insectivore'	sìlì gèé	which insectivore?
[sùmáři]	'secret society' (from Banda)	sùmári gèé	which secret society?
[wárá zǒrò]	'fruit of zǒrò tree'	wárá zǒrō gèé	which fig?

- (14) HLL → HMM (\*HHH)
- |  |   |   |                              |
|--|---|---|------------------------------|
| [yá <sup>́</sup> kò <sup>̀</sup> bà <sup>̀</sup> ] | ‘ <i>Ascaris--the intestinal worm</i> ’ | yá <sup>́</sup> kò <sup>̀</sup> bā <sup>̀</sup> gèé | <i>which Ascaris?</i>        |
| [bá <sup>́</sup> gà <sup>̀</sup> rà <sup>̀</sup> ] | ‘ <i>cow</i> ’ (from Sango)             | bá <sup>́</sup> gā <sup>̀</sup> rā <sup>̀</sup> gèé | <i>which cow?</i>            |
| [ná <sup>́</sup> kà <sup>̀</sup> rà <sup>̀</sup> ] | ‘ <i>shoe</i> ’                         | ná <sup>́</sup> kā <sup>̀</sup> rā <sup>̀</sup> gèé | <i>which shoe?</i>           |
| [pá <sup>́</sup> pā <sup>̀</sup> nà <sup>̀</sup> ] | ‘ <i>amniotic fluid</i> ’               | pá <sup>́</sup> pā <sup>̀</sup> nā <sup>̀</sup> gèé | <i>which amniotic fluid?</i> |

- (15) HHL → HHM (\*HHH)
- |           |                     |             |                      |
|-----------|---------------------|-------------|----------------------|
| [kpédésè] | ‘ <i>squirrel</i> ’ | kpédésē zân | <i>bush squirrel</i> |
|-----------|---------------------|-------------|----------------------|

**d. Tone Alternations in the Associative Construction**

L → M	HL → HH
LL → MM	HLL → HMM
LLL → LMM	LHL → LHM
LLLL → LMMM	HHL → HHM

**III. Analysis of [+upper] Spreading**

- The associative morpheme is a floating [+upper] feature specification.

**a. Derivational Analysis**

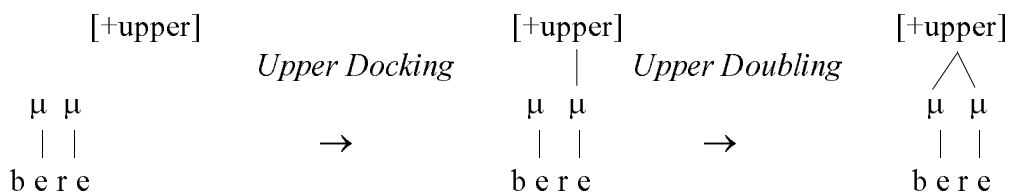
1. Upper Docking: Dock [+upper] to rightmost TBU

- (16) Upper Docking:
- $$\begin{array}{c} \mu ] \text{word} \\ \vdots \\ [+upper] \end{array}$$

2. Upper Doubling: Spread [+upper] leftwards once.

- (17) Upper Doubling:
- $$\begin{array}{c} \mu \quad \mu \\ \quad \swarrow \downarrow \\ [+upper] \end{array}$$

- (18) /bere+ASSOC géé/ ‘*which breast*’ → [bērē gèé]



3. Foot Construction: Construct a righthanded bimoraic foot at the left edge of the word.

- (19) word[( μ μ )



(23) Align[U]L: Align([+upper],L,word,L)  
Align [+upper] to the left edge of a word.

bere + [+upper]	ParseF	Align[U]R	Align[U]L
☞ bēre			
bēre		*!	
berē			*!
bere	*!		

dəkəɖɪle + [+upper]	ParseF	Align[U]R	Align[U]L
☞ dəkəɖɪlē			*
dəkəɖɪlē			**!
dəkəɖɪle	*!		
dəkəɖɪle		*!	*

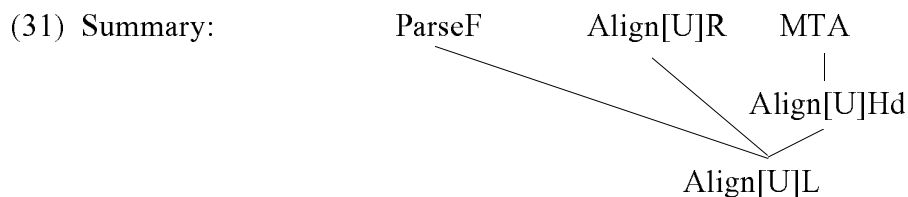
(26) Align[U]Hd: Align([+upper],L,head<sub>foot</sub>,L)  
Align the left edge of [+upper] to the left edge of the head mora of a foot.

dəkəɖɪle [+upper]	Align[U]Hd	Align[U]L
☞ (dəkə)ɖɪlē		*
(dəkə)ɖɪlē	*!	

(28) Minimal Tone Association (MTA): [+upper] must be linked to more than one TBU.  
(from Poletto 1995)

bere [+upper]	ParseF	MTA	Align[U]Hd	Align[U]L
☞ (bēre)			*	
(berē)		*!		*
(bēre)		*!	*	
(bere)	*!			

(30) Crucial Rankings:  
ParseF >> Align[U]L  
Align[U]Hd >> Align[U]L  
MTA >> Align[U]Hd  
Align[U]R >> Align[U]L



(32)

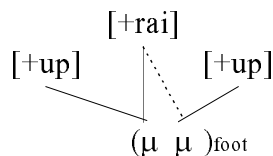
dɔkɔɖilɛ +M	ParseF	Align[U]R	MTA	Align[U]Hd	Align[U]L
☞ (dɔkɔ̄)ɖilɛ̄					*
(dɔkɔ)ɖilɛ̄				*!	**
(dɔ̄kɔ̄)ɖilɛ̄				*!	
(dɔkɔ)ɖilɛ̄			*!	*	***
(dɔkɔ̄)ɖilɛ		*!			*
(dɔ̄kɔ̄)ɖilɛ		*!		*	
(dɔ̄kɔ̄)ɖilɛ		*!*		*	
(dɔkɔ̄)ɖilɛ		*!*	*		*
(dɔkɔ)ɖilɛ		*!	*	*	**
(dɔ̄kɔ)ɖilɛ		*!***	*	*	
(dɔkɔ)ɖilɛ	*!				

(33) Gapped tone possibilities (ruled out by No Gapping constraint)  
 dɔkɔ̄ɖilɛ̄      dɔ̄kɔ̄ɖilɛ̄      dɔ̄kɔ̄ɖilɛ      dɔ̄kɔ̄ɖilɛ̄      dɔ̄kɔ̄ɖilɛ̄

#### IV. Analysis of [+raised] Spreading

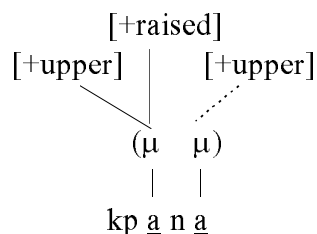
##### a. Derivational Analysis

(34) Raised Spread:

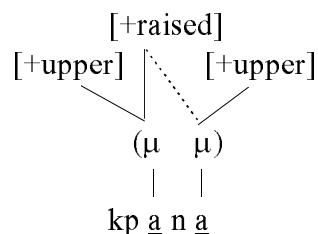


(35) /kpána + ASSOC geé/ ‘which jar’ → [kpána gèé]

*FOOT CONSTRUCTION  
& UPPER DOCKING*



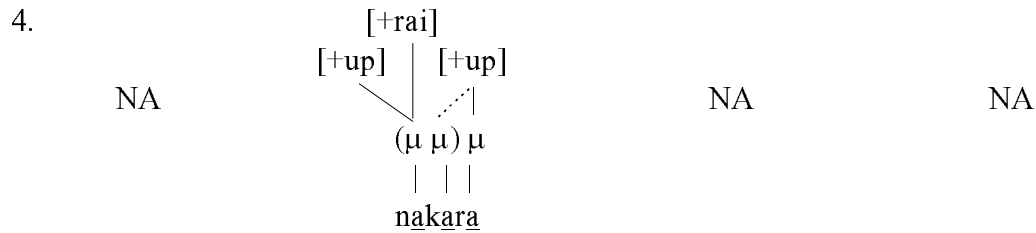
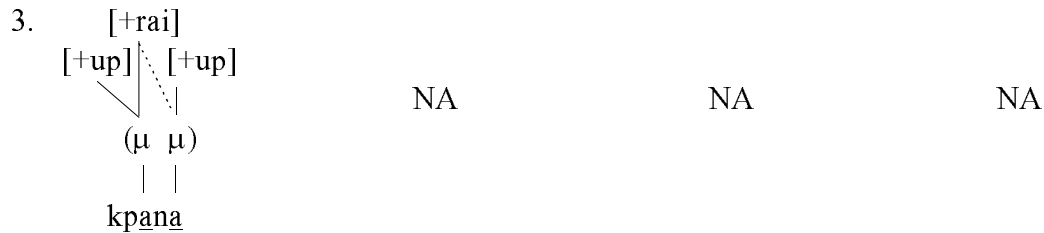
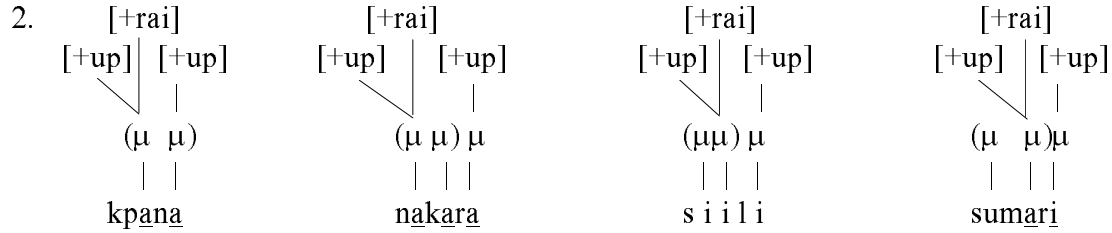
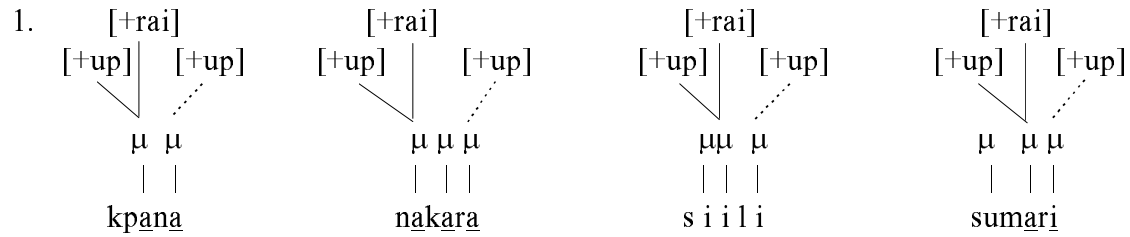
*RAISED SPREAD*



##### b. Steps in the Derivation

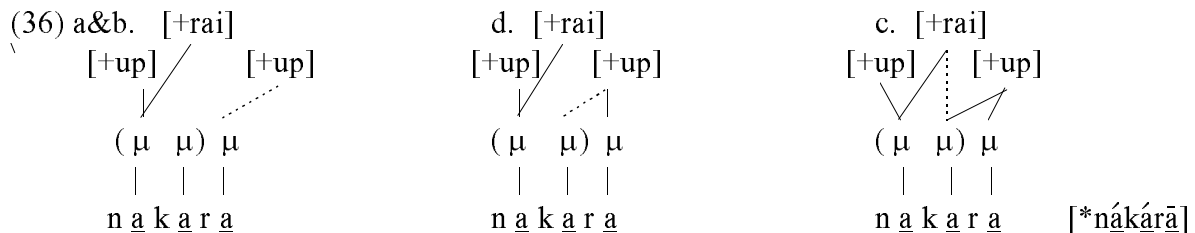
1. Docking of Associative Morpheme (16).
2. Construction of a righthanded binary foot on L edge (19).
3. Raised Spread (in (34)): Spread [+raised] rightwards if it's in the same foot.
4. Upper Doubling (17): Spread [+upper] leftwards once.

**c. Derivations:**



SR:    kpaná                      nákarā                      šiīfi                      sùmarī  
           pot                            shoe                            insectivore                      secret society

- Crucial Orderings: Upper Docking & Foot Construction precede Raised Spread. Raised Spread precedes Upper Doubling (**counterfeeding** order).
- If Upper Doubling precedes Raised Spread (ie **feeding** order), then outcome is incorrect form. (see 36)





The foot must be constructed on the left edge rather than the right edge. If it is constructed on the left edge, there is a difference between the tone patterns of the footed part of *kpánā* and *sumáṛī* before doubling and spreading occur. This difference is reflected in the surface patterns. If the foot is constructed on the right edge, there is no difference in the footed part of these words before doubling and spreading, and therefore no basis for the surface difference.

- (37) Left edge                    (kpánā)            (sumá)ṛī            (náka)rā  
 Right edge                    (kpánā)            su(má)ṛī            ná(karā)

**d. [+raised] Spreading: Ranked Constraint Analysis**

- (38) Align[R]R: Align([+raised], R, foot, R)  
 Align the right edge of the feature [+raised] to the right edge of a foot.

- (39) Violation of Align[R]R

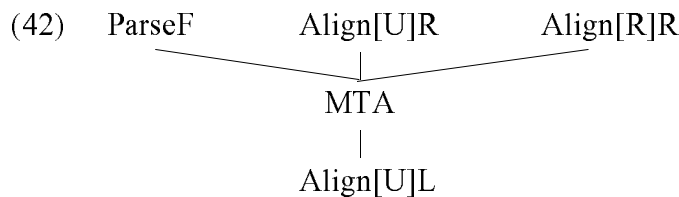
H   kpana + M	ParseF	Align[R]R
☞ (kpánā)		
(kpánā)		*!
(kpána)	*!	

- (40) ParseF, Align[U]R, Align[R]R >> MTA, Align[U]L

These crucial rankings are shown for LHL noun in the associative construction.

(41)

H   sumari + M	ParseF	Align[U]R	Align[R]R	MTA	Align[U]L
☞ (sumá)ṛī				*	**
(sumá)ṛí			*!	*	**
(sumá)ṛi	*!				
(sūmá)ṛi		*!*		*	



The same constraints and constraint ranking that select the optimal candidate for HL and LHL nouns in the associative construction will select the incorrect form for HLL nouns.

- (☞) indicates the actual surface form which should be selected but isn't.

(43)

H   <u>nakara</u> + M	ParseF	Align[U]R	Align[R]R	MTA	Align[U]L
(☞) ( <u>ná</u> kā)rā			*!		*
☞ ( <u>ná</u> ká)rā					*
( <u>ná</u> kā)rā			*!	*	**
( <u>ná</u> kā)rā		*!	*!	*	*
( <u>ná</u> ká)rā			*!		*
( <u>ná</u> ká)rā		*!		*	*
( <u>ná</u> kā)rā	*!		*		

(44) Align[R][U]: Align([+raised],R,[+upper],R)

Align the right edge of [+raised] with the right edge of some [+upper].

Align [R][U] can be satisfied by a failure to spread, since the underlying [+raised] is aligned to an underlying [+upper]. Failure to spread will result in a violation of Align[R]R.

(45) Tableau for /nákārā/ ‘shoe’

H   nākara + M	ParseF	Align[U]R	Align[R][U]	Align[R]R	MTA	Align[U]L
☞ (nákā)rā +up +up +rai				*		*
(nákā)rā +up +up +rai	*!		*	*		
(nákā)rā +up +up +rai			*!	*	*	**
(nákā)rā +up +up +rai			*!			*
(nákā)rā				*	*!	**
(nákā)ra		*!		*	*	*
** (nákā)rā				*		*
(nákā)ra		*!			*	*
(nākā)ra	*!			*		

The HHH candidate, marked \*\*, is eliminated by \*Struct.

(46)

H   kpana + M	ParseF	Align[U]R	Align[R][U]	Align[R]R	MTA	Align[U]L
☞ (kpáná) +up +up +rai					*	*
(kpánā)				*!	*	*
(kpána)	*!			*		

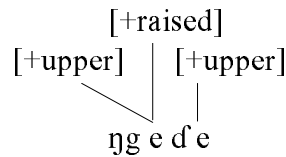


(51)

	ParseF	Align[U]R	Align[R][U]	Align[R]R	MTA	Align[U]L
() (ηgédē)			*!	*		
(ηgédé)						
(ηgēdé)						

- Alternative underlying structure satisfies Align[R][U], but not Align[R]R.

(52)



- Invoking levels doesn't help. HM words in the Associative Construction remain HM.

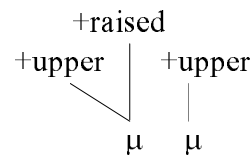
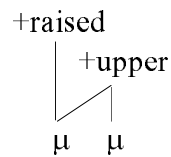
(53) ηgédē zāŋ zǔ 'turtledove of the bush'

In the derivational approach, differences in structure allow Raised Spread to operate in the Associative Construction, but not in the underlying HM noun.

(54)

Lexical HM

Raised Spread



## VI. Conclusions

1. Tone alternations in the associative construction of Suma are analyzed with counterfeeding processes in a derivational framework.
2. The counterfeeding order captures a distinction between a [+upper] derived by the process of Upper Docking and a [+upper] derived by the process of Upper Doubling.
3. A ranked constraint analysis cannot distinguish between [+upper]'s motivated by different constraints.
4. A ranked constraint analysis cannot provide a satisfactory analysis of tone alternations in the associative construction in Suma.
5. Data analyzed in terms of counterfeeding orders which make a distinction between properties derived by different processes in a derivational framework pose serious problems for ranked constraint analyses.

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