

# Tone, Minor Syllable, and Infixation in Kammu<sup>1</sup>

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## 1. The puzzle

a. [h.cóʔ] ‘thin’	[hm̀.čoʔ] ‘to make thin’
b. [k.rúk] ‘to fall’	[km̀.rúk] ‘to drop’
c. [c.ɲár] ‘green’	[cm̩.ɲàr] ‘to make green’
d. [s.ká:t] ‘rough’	[sm̩.ká:t] ‘to roughen’
e. [r̀.kèn] ‘stretched’	[rm̀.kèn] ‘to stretch’

- How are tones assigned to syllables?
- What does infixation tell us about the tonal representation?

## 2. Language information

- 2.1 Mon-Khmer spoken mainly in Laos, Thailand, Vietnam, and China.
- 2.2 Northern Kammu (Yuan dialect) described in Svantesson (1988)
- 2.3 Rich derivational morphology (prefix, infix, semi-infix<sup>2</sup>)



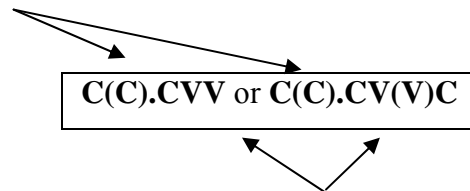
<sup>1</sup> I would like to thank Abby Cohn, Draga Zec, Marc Brunelle, Michael Wagner and the Ph2 Reading Group for their comments and suggestions on this paper. I also owe a special thank to Jan-Olof Svantesson and Yiya Chen for their correspondence and materials on Kammu.

<sup>2</sup> I use this term to refer to affixes that can be either prefixes or infixes depending on the environment.

**3. Basic phonotactics**

3.1 Roots are either monosyllabic or **sesquisyllabic** (syllable and a half) (Matisoff 1973).

- Minor syllable = the first (half-)syllable (maximally one mora)



- Major syllable = the stress second syllable (exactly two moras)

3.2 Constraints on word shapes

3.2.1 **Maximality:** A phonological word must be exactly an iambic foot.

(PWORD = FOOT; ALIGN(PHEAD, R; PWORD, R)

3.2.2 **Bimoraic requirement:** A stressed syllable must be bimoraic

(PHEAD = μμ)

3.2.3 **Obligatory onset:** A syllable must have an onset (ONSET)

**4. Typology of phonological word**

4.1 Syllabification of initial consonants

Initials	monosyllabic	sesquisyllabic
obstruent+obstruent	✗	✓
obstruent+nasal	✗	✓
obstruent+liquid	✓	✓
stop+h	✓	✗

4.1.1 Sonority plays a crucial role in syllabification.

4.1.2 Contrast between CR and C.R suggests that there might be some sort of vocalic specification in the lexical input, e.g.

a. [kló:k] ‘bamboo bowl’ vs. [k.ló:k] ‘slit drum’

b. [p.crá:p] ‘fix with a fork’ vs. [pc.rà:c] ‘pig mesentery’

4.2 Test for syllabicity (monosyllable with onset cluster vs. sesquisyllable)

- Placement of certain affixes: prefix vs infix
- Word-play “kàm p̄.ʔɛːn”: whether both Cs are copied
- Acoustic differences (Svantesson 2004)

**5. Tonology**

5.1 Two-way tonal contrast (H vs. L): Each syllable can bear at most one tone.

- a. [pá:t] ‘to slice’                      [pà:t] ‘to sharpen’
- b. [má:n] ‘to bury’                      [mà:n] ‘pregnant’
- c. [klú:p] ‘rainhat’                      [klù:p] ‘to fall down’

5.2 Tone and syllable structure

	minor syllable	major syllable
C(R)VC		tonal
C.CVC	toneless	tonal
R.CVC	tonal	tonal
CC.CVC	tonal	tonal

R = liquid

5.3 Tone on sesquisyllables

5.3.1 With toneless minor syllables

- Consists of only one obstruent = C
- Only the major syllable can have tone, either H or L.

- |                      |                               |
|----------------------|-------------------------------|
| H                    | L                             |
| a. [h.cóʔ] ‘thin’    | e. [c.mòl] ‘to sow’           |
| b. [c.ɲár] ‘green’   | f. [k.màʔ] ‘rain’             |
| c. [k.rúk] ‘to fall’ | g. [p.kù:n] ‘respect’         |
| d. [s.ká:t] ‘rough’  | h. [p.kòl] ‘(exp) get caught’ |

5.3.2 With tonal minor syllables

- Only if minor syllable consists of R or CC (affixation; coda copying)

	H H		H L
a.	[sɲ.lá:k] ‘curiosity’	c.	[km̌.nòh] ‘cutting-board’
b.	[sm̌.ʔjé:] ‘to look with one eye’	d.	[p̌ř.nòʔ] ‘broom’
	L H		L L
e.	[řč.hóc] ‘carving’	g.	[km̌.nòh] ‘weeding-period’
f.	[ǩť.mút] ‘to scent’	h.	[ř.kè:ŋ] ‘bamboo strip’

5.3 Tone is licensed by a mora-bearing nucleus (Sloan 1988).

5.3.1 Toneless minor syllables are weightless.

5.3.2 Tonal minor syllables are monomoraic.

5.4 Tonal dissimilation: H H → L H if the minor syllable onset is an unaspirated voiceless stop (Svantesson 1983:55-57)<sup>3</sup>.

H	H	→	L	H
/p,t,c,k/			/p,t,c,k/	

## 6. Causative affix

6.1 For earlier analyses, see Svantesson (1983) and Chen (1998).

6.2 Allomorphy (Svantesson 1983:107-110)

	monosyllabic		sesquisyllabic
	C-	CR-	
[p-]	✓		
[pn-]	✓	✓	
[-m-]			✓

6.2.1 [p-] and [pn-] are unpredictable allomorphs (specified in the lexicon)

6.2.2 [pn-] → [-m-] to satisfy PWORD = FOOT (see 3.2.1)

<sup>3</sup> This is true across the board, resulting in a lack of H H in words whose surface minor syllable is a stop.

## 6.3 /p-/

6.3.1 Only prefixes to monosyllables.

6.3.3 Specified for H underlyingly.

6.3.3 H of the prefix overrides tone of the base (only one slot for tone).

$$H_A + H \rightarrow H$$

- |                           |                           |
|---------------------------|---------------------------|
| a. [há:n] ‘to die’        | [phá:n] ‘to kill’         |
| b. [lúh] ‘to have a hole’ | [plúh] ‘to make a hole’   |
| c. [cá:k] ‘pole’          | [p.cá:k] ‘to plant poles’ |

$$H_A + L \rightarrow H$$

- |                             |                              |
|-----------------------------|------------------------------|
| d. [là:c] ‘to disappear’    | [plá:c] ‘to take away’       |
| e. [ŋò:m] ‘to fall on sth.’ | [p.ŋó:m] ‘to make sth. fall’ |
| f. [kù:t] ‘to go in’        | [p.kú:t] ‘to take in’        |

## 6.4 /pn-/

6.4.1 Either prefix or infix depending on the shape of the base

- Prefix as [pn-] if base is monosyllabic
- Infix as [-m-] if base is sesquisyllabic

6.4.2 C(R)VC bases

- Always prefixes as [pn-]
- Specified for H but does not override the tone of the base because it comes with its own moraic rime.

$$H_A + L \rightarrow H_A L$$

- |                     |                                 |
|---------------------|---------------------------------|
| a. [nà:m] ‘happy’   | [pń.nà:m] ‘happy’               |
| b. [tèʔ] ‘to get’   | [pń.tèʔ] ‘to cause to get’      |
| c. [krùal] ‘alive’  | [pń.krùal] ‘to spare sb’s life’ |
| d. [klèʔ] ‘husband’ | [pń.klèʔ] ‘to marry off’        |

$$H_A + H \rightarrow H_A H \rightarrow L_A H^4$$

- |                             |                             |
|-----------------------------|-----------------------------|
| e. [pó:l] ‘to roll (intr.)’ | [pń.pó:l] ‘to roll (tr.)’   |
| f. [téʔ] ‘to kick’          | [pń.téʔ] ‘to cause to kick’ |
| g. [krú:m] ‘awestruck’      | [pń.krú:m] ‘to be haughty’  |
| h. [kléʔ] ‘to appear’       | [pń.kléʔ] ‘to show’         |

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<sup>4</sup> Tonal dissimilation

## 6.4.2 C.CVC bases

- Always infixes as [-m-]
- In the derived form, the tone of the minor syllable in normal cases matches that of the base.
- In the derived form, the tone of the major syllable is not predictable from the surface form of the base. This suggests an underlying ‘floating tone’.

$$H_A + H \rightarrow H L$$

- |                               |                            |
|-------------------------------|----------------------------|
| a. [c.ŋá:r] ‘green’           | [cm̌.ŋà:r] ‘green’         |
| b. [s.kár] ‘straight’         | [sm̌.kàr] ‘to straighten’  |
| c. [t.lú:j] ‘to hang (intr.)’ | [tm̌.lù:j] ‘to hang (tr.)’ |

$$H_A + H \rightarrow H H$$

- |                     |                         |
|---------------------|-------------------------|
| d. [s.ká:t] ‘rough’ | [sm̌.ká:t] ‘to roughen’ |
|---------------------|-------------------------|

$$H_A + H \rightarrow L H$$

- |                      |                     |
|----------------------|---------------------|
| e. [k.rúk] ‘to fall’ | [km̌.rúk] ‘to drop’ |
|----------------------|---------------------|

$$H_A + L \rightarrow L L$$

- |                               |   |
|-------------------------------|---|
| f. [p.ʔù:ŋ] ‘to have roasted’ | [p̌ǰ.ʔù:ŋ] <sup>5</sup> ‘to give sth. a roasted smell’ |
|-------------------------------|---|

$$H_A + L L \rightarrow L L$$

- |                          |                       |
|--------------------------|-----------------------|
| g. [ř.kèŋ] ‘to stretch’ | [rm̌.kèŋ] ‘stretched’ |
|--------------------------|-----------------------|

## 6.4.3 CC.CVC bases

- Always infixes as [-m-]
- One of the minor-syllable consonants is dropped.
- One too many consonant: minor syllables are maximally CC.
- In the derived form, the tone changes only if the leftmost consonant is dropped to meet the word-shape constraints.

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<sup>5</sup> \*pm- is not allowed.

- a. [k̀r̀.ɬ̀ùaŋ] ‘to fall on sb’s back’      [k̀m̀.ɬ̀ùaŋ] ‘to lay on its back’
- b. [h̀r̀.ɬ̀a:k] ‘strange’                      [r̀m̀.ɬ̀a:k] ‘to make sth. strange’
- c. [h̀r̀.ɬ̀o:j] ‘to float’                        [r̀m̀.ɬ̀o:j] ‘to set a float’

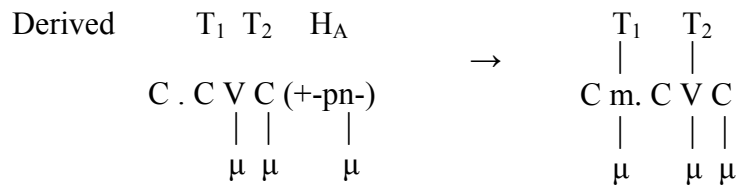
**7. Two accounts**

**7.1 Unlinked tone analysis**

- In the input, tone is unlinked but in the output it is linked to a mora-bearing nucleus.

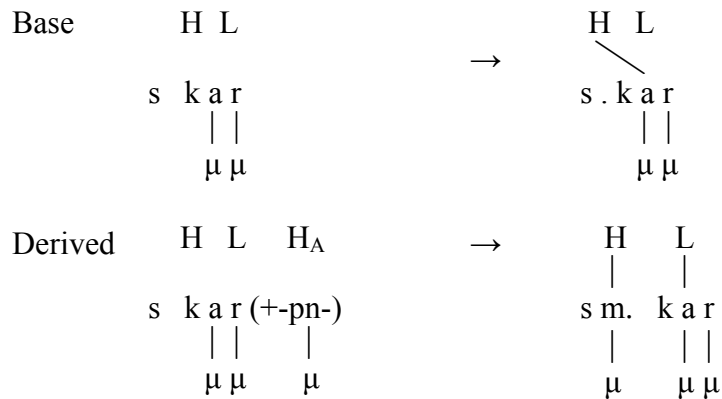


- Constraint(s) or rule(s) that preserve the leftmost tone.

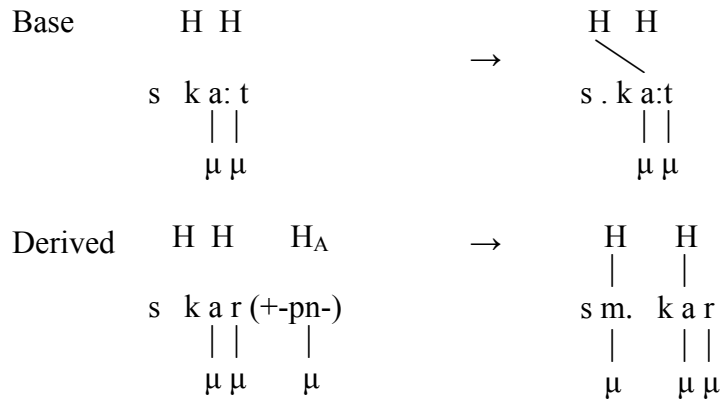


- H of /-pń-/ is lost when it becomes reduced to [-m-], and thus does not contribute to the computation of tone assignment.

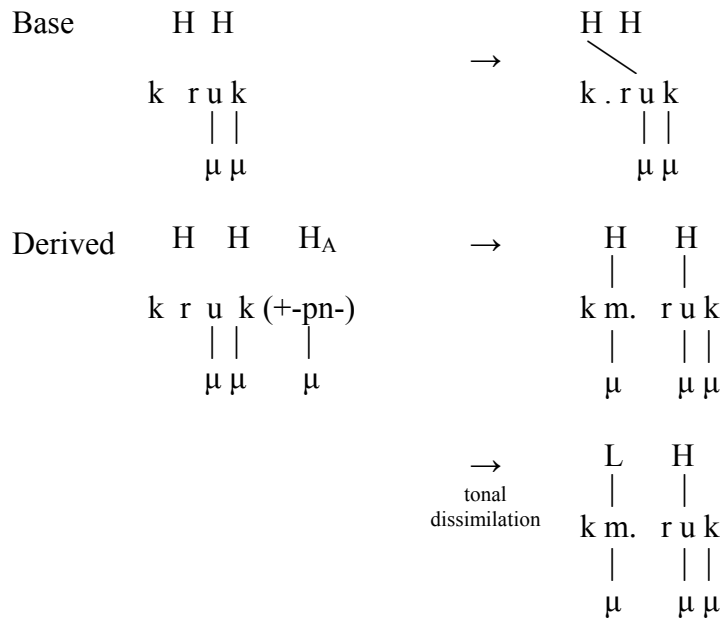
7.1.1 [s.kár] ‘straight’ → [sm̃.kàr] ‘to straighten’



7.1.2 [s.ká:t] ‘rough’ → [sm̩.ká:t] ‘to roughen’

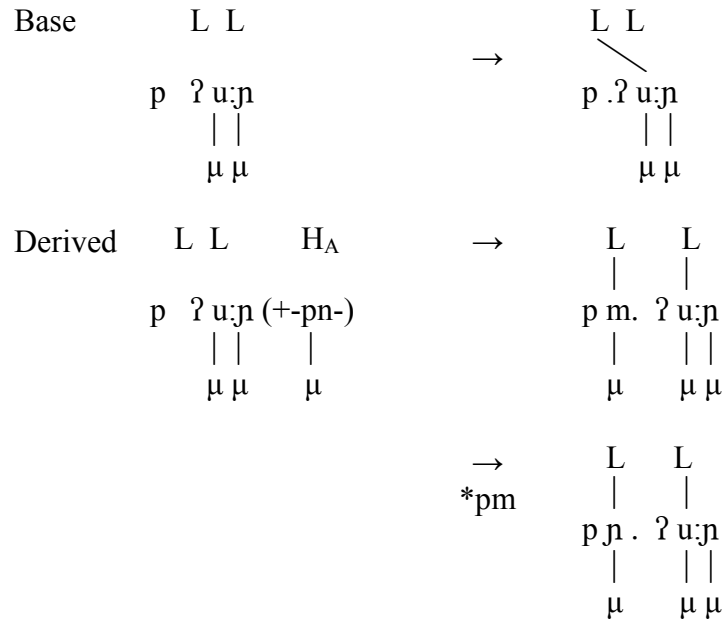


7.1.3 [k.rúk] ‘to fall’ → [km̩.rúk] ‘to drop’ (tonal dissimilation)

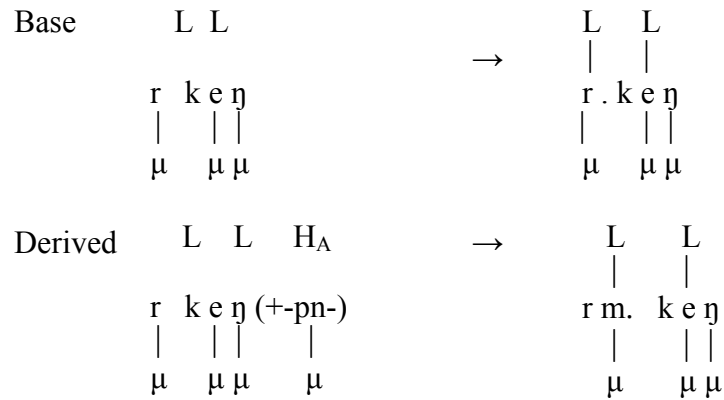




7.1.4 [p.ʔù:ɲ] ‘to have roasted’ → [pɲ.ʔù:ɲ]<sup>6</sup> ‘to give sth. a roasted smell’



7.1.5 [ṛ.kèŋ] ‘to stretch’ → [ṛm.kèŋ] ‘stretched’

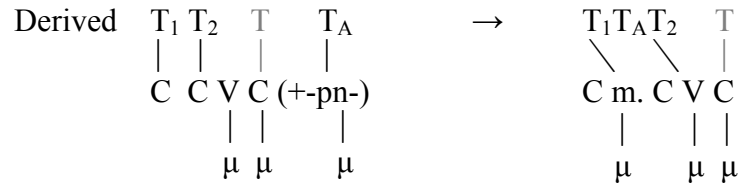


**7.2 Tonal-consonant analysis**

- In the input, every consonant has a tonal specification but in the output they are re-associated with a moraic nucleus.

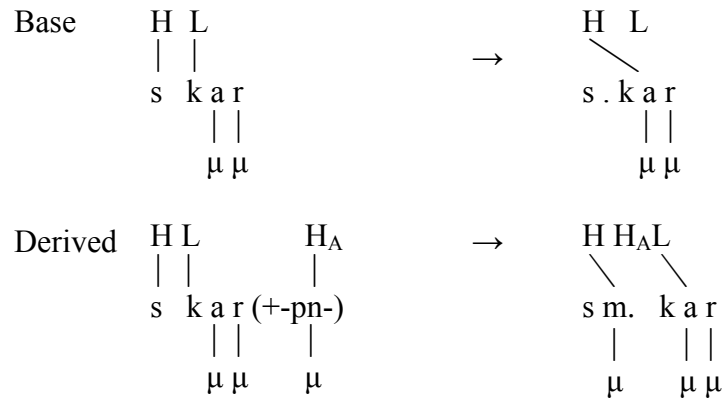


<sup>6</sup> \*pm- is not allowed (see Svantesson 1983:109).

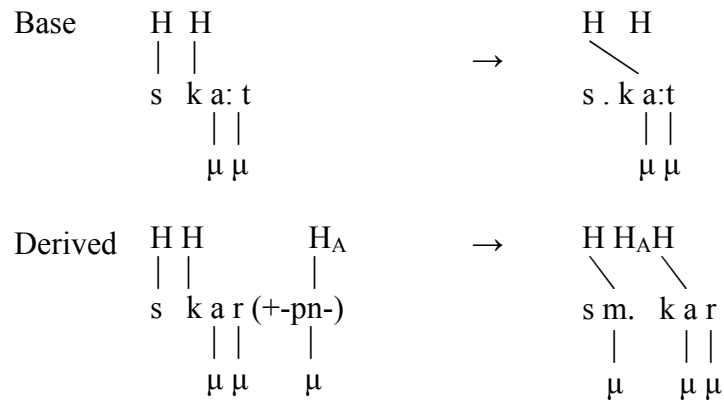


- Constraint(s) or rule(s) that link tone to the first mora-bearing nucleus following the consonant it is originally associated with.
- Tones of consonants that surface as coda are never realized.

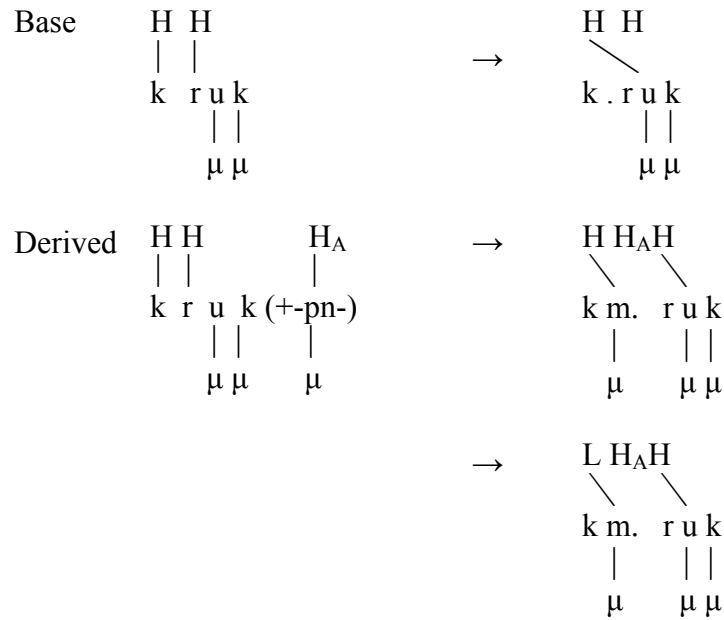
7.2.1 [s.kár] ‘straight’ → [sm̩.kàr] ‘to straighten’



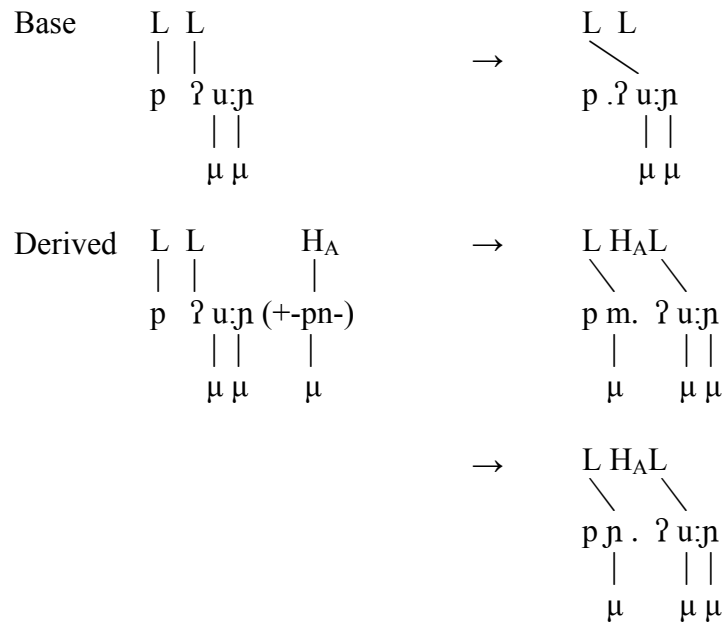
7.2.2 [s.ká:t] ‘rough’ → [sm̩.ká:t] ‘to roughen’



7.2.3 [k.rúk] ‘to fall’ → [km̀.ruk] ‘to drop’ (tonal dissimilation)



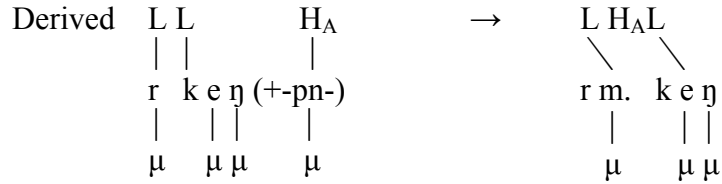
7.2.4 [p.ʔù:ɲ] ‘to have roasted’ → [pɲ̀.ʔù:ɲ]<sup>7</sup> ‘to give sth. a roasted smell’



7.2.5 [r̀. kèɲ] ‘to stretch’ → [r̀m. kèɲ] ‘stretched’



<sup>7</sup> \*pm- is not allowed (see Svantesson 1983:109).

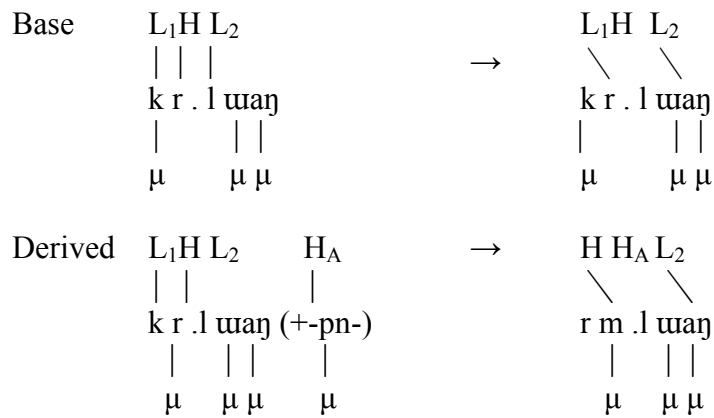


**8. Unlinked tone vs. tonal consonant**

8.1 Infixation to CC.CVC bases

Bases	$\rightarrow$	Causatives
a. [kr̥.lù:ɲ] ‘to fall on sb’s back’	$\rightarrow$	[km̥.lù:ɲ] ‘to lay on its back’
b. [hr̥.là:k] ‘strange’	$\rightarrow$	[rm̥.là:k] ‘to make sth. strange’
c. [hr̥.lò:j] ‘to float’	$\rightarrow$	[rm̥.lò:j] ‘to set a float’

- The unlinked-tone analysis predicts that tones in (b) and (c) do not change.
- The tonal-consonant predicts: \*[kr̥.lù:ɲ]  $\rightarrow$  \*[rm̥.lù:ɲ].

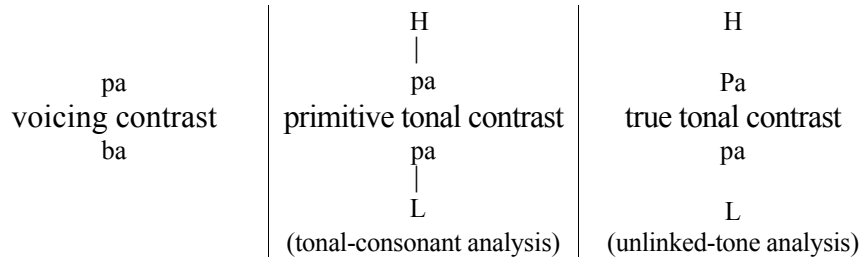


8.2 The unlinked-tone analysis has to stipulate that the infix version of /-pn-/ does not have an underlying tone.

8.3 The tonal-consonant analysis is typologically and theoretically marked.

- It posits tones that never surface.
- It is hard to see how learners would acquire such an opaque system

8.4 Both analyses are consistent with the diachrony of tonal development but the tonal-consonant account provides an intermediate stage.



**9. Conclusion**

- 9.1 In Northern Kammu, each sesquisyllabic root has two underlying tones but the number of mora-bearing nuclei determines the number of surface tones.
- 9.2 /-pn-/ provides an additional slot for tones to surface.
- 9.3 The unlinked-tone analysis is simpler must stipulate loss of infix tones and does not predict patterns of infixation of CC.CVC.
- 9.4 The tonal-consonant analysis is typologically and theoretically marked but makes a straight-forward prediction about the CC.CVC cases.
- 9.5 The deciding factors would be data on CC.CVC syllables and how these patterns of infixation fit into the picture.

### References

- Chen, Yiya. 1998. Causative Affix in Kammu. Paper presented at the 74th Annual Meeting of the Linguistic Society of America, Grand Hyatt Hotel, New York, NY.
- Gandour, Jack, Gårding, Eva, and Lindell, Christina. 1978. Tones in Northern Kammu: A perceptual investigation. *Acta Orientalia*, 39: 181-189.
- Matisoff, James A. 1973. Tonogenesis in Southeast Asia. *Consonant Types & Tones*, ed. by Larry M. Hyman. Los Angeles: The Linguistic Program, University of Southern California.
- Shaw, Patricia. 1994. The Prosodic Constituency of Minor Syllable. *Proceedings of West Coast Conference on Formal Linguistics 12*, ed. by Erin Duncan, Donka Farkas and Philip Spaelti. Stanford: Stanford Linguistics Association.
- Sloan, Kelly. 1988. Bare-Consonant Reduplication: Implications for a Prosodic Theory of Reduplication. *Proceedings of West Coast Conference on Formal Linguistics 7*, ed. by H. Borer. Stanford: Stanford Linguistics Association.
- Svantesson, Jan-Olof. 1983. *Kammu Phonology and Morphology*. Lund, Sweden: Liber Forlag.
- Svantesson, Jan-Olof. 2004. Syllable boundaries in Kammu. *Proceedings of FONETIK 2004*, Dept. of Linguistics, Stockholm University.