

Compensatory lengthening is not specific to segments¹

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1. Preamble - Dialects of the group Yue (Cantonese, Bobai, Xinyi, etc.)
 - ✓ Compared with Mandarin Chinese where occlusive codas disappeared during historical evolution, the dialects of the group Yue conserve well occlusive codas;
 - ✓ The tonal system of ancient Chinese is well conserved in Yue, whereas there are only four lexical tones in Mandarin, due to the contact with non tonal languages such as Mongol and Manchu.
 - ✓ There are six lexical tones in open syllable in Cantonese, 33, 22, 35, 23, 53 (55), and 21 ; three entering tones are observed in closed syllable, 5, 3, 2.
2. Phenomenon
 - ✓ Yue dialects have a process whereby a rising tone replaces the lexical tone of the head noun to derive, among others, diminutive forms, referred to as *Pinjam* (changed tones) in the literature.

(1) Derivation of diminutives

t ^h oi21	“terrace”	t ^h oi35	“table”
k ^{wh} ɛn21	“skirt”	wɛi21 k ^{wh} ɛn35	“apron”
kɛŋ33	“mirror”	ŋan23 kɛŋ35	“eyeglasses”
t ^h ɔŋ21	“sugar”	t ^h ɔŋ35	“candy”
nøɣ23	“female”	nøɣ35	“girl”

ɔp3	“duck”	~	ɔp35
kɔt2 tsɔt2	“cockroach”	~	kɔt2 tsɔt 35
kɔp3	“pigeon”	~	kɔp35

(2) Verb nominalization

Level tone		Rising tone	
sou33	“to sweep”	sou35	“a broom”
pɔŋ22	“to weigh”	pɔŋ35	“a scale”
wa22	“to listen”	wa35	“an utterance”
tan22	“to plunk”	tan35	“a missile”

(2) Omission of perfective marker and potential marker

a.	paŋ22 tsɔ35	→	paŋ35	“to weigh (PERFECTIVE)”
	fan22 tsɔ35	→	fan35	“to transgress (PERFECTIVE)”
	ki:n33 tsɔ35	→	ki:n35	“to meet (PERFECTIVE)”
b.	pɔŋ22 tɛk55	→	pɔŋ35	“to weigh (POTENTIAL)”
	fan22 tɛk55	→	fan35	“to transgress (POTENTIAL)”
	ki:n33 tɛk55	→	ki:n35	“to meet (POTENTIAL)”

2.1 Traditional representations of rising contour derived from *Pinjam*

✓ Yip (1980) et Chen (2000)

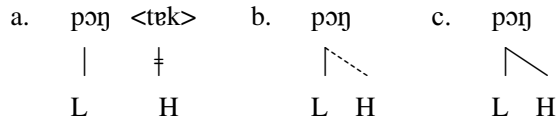
(5)	sou	“to sweep”	sou	“a broom”
			\	
	M H		M H	

(6) paŋ22 tsɔ35 → paŋ35 “to weigh (PERFECTIVE)”

a.	paŋ	< tsɔ >	b.	paŋ	c.	paŋ
		‡		\		
	L	LH		L LH		LH

¹ My cordial thanks are due to Joaquim Brandão de Carvalho, Jean-Marc Beltzung and Naomi Yamaguchi for helpful discussions.

(7) pɔŋ22 tək55 → pɔŋ35 “to weigh (POTENTIAL)”



✓ Problems :

- a. Previous phonological treatments posit a floating high tone attaching to the end of the relevant syllable, creating a new 35 tone. However, when the perfective marker has already a rising contour tone, this hypothetical high floating tone disappears from the representation. If the *Pinjam* always carries the same rising contour tone, why to explain it with two different conjectures?
- b. The above account predicts that the derived rising tone has the same duration as the lexical rising tone. However, Chao (1947) and Benedict (1942) noticed that, in Cantonese, the derived rising tone has a slightly longer duration than the lexical rising tone.
- c. The same phenomenon is observed in Bobai and Xinyi, where the derived rising tones are longer than the lexical rising tone (Wang 1932, Yu & Shen 1987).

2.2 Phonetic experiment:

- ✓ A Cantonese native speaker born in the province of Guangdong participated in the study here. He read the word list, each word with five repetitions.

(8)

	Mean duration of lexical rising tone		Mean duration of derived rising tone
sister [ze]	0.29	girl [nøɣ]	0.51

bitter [fu]	0.21	candy [t ^h ɔŋ]	0.54
to write [se]	0.25	apron [wəi k ^w hɛn]	0.4
to speak [koŋ]	0.29	call girl[mu nøɣ]	0.6
cause [saj]	0.24	table [t ^h oi]	0.54
Mean duration	0.256	Mean duration	0.518
Standard deviation	0.03	Standard deviation	0.08
Ratio lexical : derived	1 : 2.02		

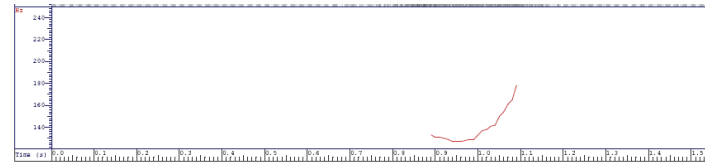


Figure 1 : [fu 35] "bitter"

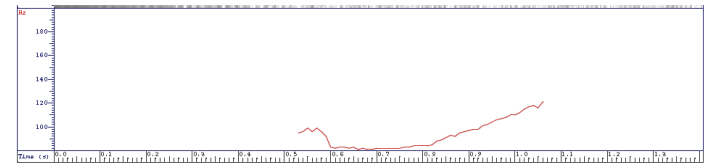


Figure 2 : [t^hɔŋ 35] "candy"

- ✓ Even the longest lexical rising tone averages shorter in duration than the shortest derived rising tone.

2.3 Establishing a correspondence between the Mandarin diminutive suffix [-ɿ] and the Cantonese high rising *Pinjam*, Chao used *mora* to describe this

additional length, suggesting that the Cantonese suffix is a mora taking the form of a high tone rather than sound segments.

⇒ This conjecture, capable of explaining the additional length associated with the *Pinjam*, is contrary to current theories according to which tones, being suprasegmental objects, have no temporal basis of their own. How to solve this paradox?

2.4 Origin of *Pinjam*

- ✓ Chao (1947) & Wong (1982): Cantonese *Pinjam* result from the elision of certain morphemes which are no more productive synchronically.
- ✓ Whitaker (1956) drew a more explicit connection between the Cantonese *Pinjam* and the Mandarin suffix [-ŋ], suggesting that the latter is the ultimate source of the Cantonese *Pinjam*. At a later stage, the suffix disappeared but left a trace in the form of *Pinjam*.
- ✓ Whitaker's theory is based on the distribution of this suffix in the Yue dialects of Bobai. She proposed that the Bobai dialect's use of the suffix had preserved an earlier historical stage in the development of Yue and thus shed light on its development in Cantonese.

2.5 Wang Li (1931) : Bobai (dialect of the group Yue)

- (9) a. kae32 jin25 "chick"
 iaŋ21 jin25 "little sheep"
 ma21 jin25 "little horse"
- b. æk54 "house" → oŋ25 "little house"
 mat32 "thing" → man25 "little thing"
 hɔp4 "box" → hɔm25 "little box"
 pak1 "uncle" → a33-paŋ25 "my little uncle"

- ✓ After suffixation with [jin25] and homorganic nasalization of final stop consonants, diminutivization in Bobai involved change of the original tone to the long rising *Pinjam* without suffixation, a pattern which closely resembles the Cantonese *Pinjam*.
- ✓ Whitaker (1956) interpreted these three synchronic processes of suffixation as three diachronic stages in the development of the long rising tone: in the first stage the suffix [jin] with a rising tone is used; by the second stage the suffix has been lost but left tonal (long rising tone) and segmental (nasalization of the final occlusive) traces; in the third stage, the nasalization has disappeared, leaving only the long rising *Pinjam*.

3. Compensatory lengthening is not specific to segments

- ✓ O'Melia (1939) and Whitaker (1956) had the intuition that the additional length of *Pinjam* was to compensate the loss of the elided syllable.
- ✓ A question arises as to the nature of this compensatory lengthening: how do we know if it is the vowel or the tone that lengthens?

✓ Two possibilities :

3.1 Tone lengthens because of vowel lengthening

- ✓ Since Goldsmith (1976), only syllabic constituents and/or melodic segments are capable of lengthening through their association to skeletal positions. Tones, being autosegments, do not have a temporal basis and thus cannot lengthen by themselves.
- ✓ However, if the additional tonal duration had to be explained by the compensatory lengthening of vowels, no change in length would be expected to occur in closed syllables.
- ✓ A case of vowel lengthening in closed syllables: *CVCV > CV:C

(10) Friulian (Kavitskaya 2002)

a.	Latin		Friulian	
	lupum	>	*lupu	>
	lo:f			
				‘wolf’
	novum	>	*novu	>
	nu:f			
				‘pure’
	dekem	>	*detʃe	>
	di:ʃ			
				‘ten’
	nivem	>	*nive	>
	ne:f			
				‘snow’

- ✓ In *CVCV > CV:C, the second vowel in a CVCV sequence is lost with a subsequent lengthening of the preceding vowel. What is the nature of this lengthening?
- ✓ Kavitskaya argues that the inherent phonetic vowel duration of the first vowel in CVCV, being in open syllables, is reinterpreted as phonologically relevant after a change in the conditioning environment (syllable structure).
- ✓ A similar hypothesis is observed in Morin (2007):

(11) Wallon de Liège

- a. Open syllables in Western Romance
 - NĀSŪM > [ne:] "nose"
 - MÖSĀ > [mu:s] "Meuse"
- b. Closed syllables in Western Romance
 - GRÖSSŪM / GRÖSSĀM > [grɔ̃] / [grɔ̃s] "big"

⇒ Vowel duration in Wallon de Liège is conditioned by the syllable structure of Western Romance: the vowel is phonetically long in open syllables, and short in closed syllables.

- ✓ On the contrary, there is no long vowel pre-existing to the disappearance of the diminutive suffix in Yue dialects.
- ✓ [mat32 jin25] “thing” (Bobai)
 - ✧ The noun [mat] is closed by a consonant, and the suffix [jin] begins with a consonant too. The vowel of the head noun cannot have a long

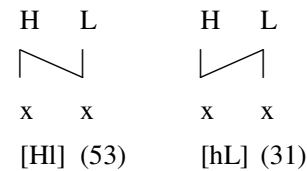
allophone!

- ✓ The first possibility is thus excluded: vowel lengthening is impossible, and the additional length associated with *Pinjam* doesn't result from vowel lengthening.

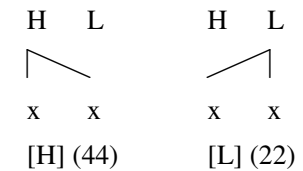
3.2 Vowel lengthens because of tone lengthening

- ✓ The additional length associated with *Pinjam* can be explained by assuming that tones are *intrinsically positional objects*, and, more specifically, that they make up a universal periodic skeleton HLHL (Carvalho 2002).
- ✓ The interaction between tones and temporal positions is proposed as follows; the register is represented by the spreading of a tonal segment to an adjacent position.

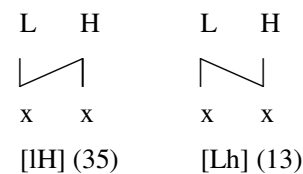
(12) a. falling contour tone



b. level tones



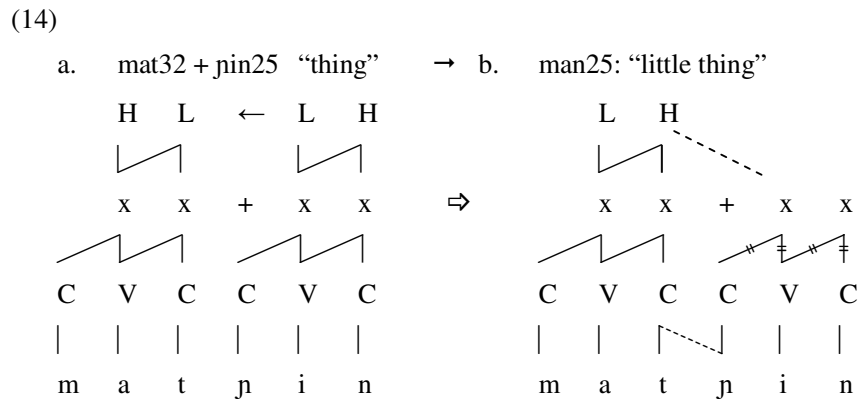
c. rising contour tone



⇒ The capital letter indicates the register.

- ✓ The successive stages of the development of *Pinjam* in Yue can be illustrated as follows :

- (13) a. Suffixation
 ⇒ ma21 jin25 “little horse” (Bobai)
- b. Nasalization of the occlusive coda
 ⇒ mat32 “thing” + jin25 → man32 jin25 “little thing” (Bobai)
- c. Suffix loss and emergence of a tonal suffix with compensatory lengthening
 ⇒ tʰɒŋ21 “sugar” → tʰɒŋ35: “candy” (Cantonese)



- ✓ In (13b), the nasal feature provided by the elided diminutive suffix [jin25] nasalizes the coda of the preceding syllable. The tone of the diminutive suffix [jin25] replacing that of the head noun, the second tonal segment of the rising contour, H, expands to fill the vacuum left by the elision of the neighboring syllable.
4. Theoretical implications of the present hypothesis
- ✓ It has been shown that tones cannot be treated as pure melodies in Chinese dialects: they do have *a temporal basis*.

- ✓ Tones have the same status as syllabic components (onset and rime) *vis-à-vis* the skeleton.
- ✓ **Prediction:** the substitution of segmental primes shall not preclude tonal stability.
 - ✧ This prediction is attested in Chinese secret languages (*Fanqie* languages), where segmental melodies are replaced under reduplication while tones remain stable (Liu 2007).
- ✓ A conjecture based on the segmental compensatory lengthening will encounter one problem: if the additional tonal duration had to be explained by the compensatory lengthening of vowels, no change in length would be expected to occur in closed syllables.
- ✓ Now, the additional length is observed in both open and closed syllables in *Pinjam*. Consequently, it is tone that lengthens under syllable elision, not vowel. In other words, the vowel lengthens under the pressure of the tone, not the tone under the pressure of the vowel.

5. Appendix - Tonal markedness

- a. Analogy between CVCV and HLHL
- ✓ The falling tone HL is unmarked by comparison with the rising tone LH, because the latter supposes two empty positions on its right and left sides.
 - ✓ Level tones are, in Asian languages, more marked than contour tones since their lexical representations involve an empty position. See (11b).
 - ✓ If the nucleus is said to be the sonority peak since Sievers (1876) and Jespersen (1912), we might ask what the tonality peak is in the tonal domain. From an acoustic point of view, the high tone is more prominent than the low one (de Lacy 2002). Let us hypothesize that it has the same status as the nucleus in the syllable skeleton. Consequently,

just as V is structurally unmarked compared with C, H should be unmarked by comparison with L. The existence of low level tones, structurally marked, should imply the presence of high level tones.

b. Typological evidence

- ✓ In a statistics on 187 tonal languages, Zhang (2002) noticed that 37 languages have a falling tone without a rising one. Only three languages have a rising tone without a falling one: Margi, Lealao Chinantec and Zengcheng.
- ✓ A language can have only contour tones without level tones, as in Chengtu, Shanghai, Zhenhai, Pingyao and Wuxi, while no Chinese language has only level tones.
- ✓ The unmarkedness of the high level tone compared with the low level tone is supported by the typology: in Cantonese, Tianjin, and Taiwanese, the low level tone and the high level tone coexist; Mandarin has only the high level tone without its low counterpart.

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