The representation of contour tones in Cantonese

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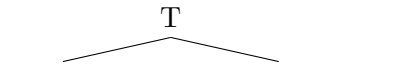
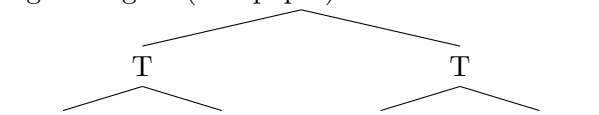
Introduction: A central question in tonal phonology is the representation of tone. For Chinese languages, recent analyses such as Yip (2001) and Barrie (2007) propose that the contour tone be represented as a unitary entity with only the tonal onset specified. This paper argues, however, that this is incorrect for Cantonese. Specifically, the correct representation of contour tones in Cantonese is the one akin to the Africanist tradition where tonal onset and offset are *separately* specified. Three arguments converge to the conclusion for such a less parsimonious contour tone representation: (i) the mapping between tone and musical melody in pop music, (ii) the phonetic realization of the high-rising tone, and (iii) tonal morphophonology.

Yip and Barrie on Chinese contour tones: Yip and Barrie propose that the Chinese contour tone be represented as a unitary entity with only one register [±upper] feature specified for the whole contour tone. Moreover, only the tonal onset, but not tonal offset, is specified for the pitch feature [±raised]. To signal a contour tone, a [contour] feature (Barrie) or unspecified 'rebound' (Yip) is used. To illustrate, (1) shows the representation of a high-rising tone 35 in Barrie's system: [+upper] restricts the whole tone to be in the upper half of the tonal space, [−raised] specifies that the tone begins at the lower portion of the relevant half of the tonal space, and [contour] signals that the tone is a contour one; the tonal trajectory is upward but not downward, because a downward trajectory would leave the [+upper] tonal space. (2) is what I propose for representing Cantonese contour tones, exemplified by a high-rising tone 25. Most importantly, tonal onset and offset are separately specified with independent [±upper] and [±raised]. The values of [±upper] can switch between onset and offset, which is impossible in Yip and Barrie's proposal.

(1) High-rising 35 (Barrie)



(2) High-rising 25 (this paper)



Argument 1: Pop music and reference to tonal offsets In Cantonese pop music lyrics, tones 55 and 25 are interchangeable without causing anomalies, and so are the tones 33 and 23; these two tone pairs pattern together by their tonal offsets (see, e.g., Chan 1987). Regarding the 55/25 pair, Barrie's system, for instance, specifies 55 as [+upper, +raised], and 25 (35 for Barrie) as [+upper, −raised, contour]. While 55 and 25 share [+upper] only, 33 is also [+upper]. This means that Barrie's tonal representations for Cantonese cannot *uniquely* single out 55 and 25. Similarly, for the 33/23 pair, the two tones are [+upper, −raised] and [−upper, −raised, contour] for Barrie. These two tones are [−raised], but so are 35 [+upper, −raised, contour] and 11 [−upper, −raised]. The problem vanishes if the tonal offsets of contour tones are also specified, i.e., the tonal offset of *only* 55 and 25 is [+upper, +raised], whereas the tonal offset of *only* 33 and 23 is [+upper, −raised].

Argument 2: The phonetics of the high-rising tone and [±upper] On the one hand, Bauer and Benedict (1997) find that the non-derived high-rising tone 25 and low-rising tone 23 share an acoustically similar tonal onset. On the other, Yu (2007) shows that the non-derived high-rising tone 25 and the derived high-rising tone 35 resulting from lexical tone 33 (e.g., si33 'try' → si35 'try (perfective)') are in fact acoustically differentiable. In the spirit of a closer phonetics-

phonology mapping supported by Yip, if 23 has all its tonal trajectory within [−upper], and if 35 is all within [+upper], then 25 should begin in [−upper] but have [+upper] to accommodate its high tonal offset. However, this is disallowed in Yip and Barrie's system, because they both propose that [±upper] be a feature of an entire contour tone. The solution is to have both tonal onsets and offsets specified separately for [±upper].

Argument 3: Tonal alternation in attenuatives Tonal alternation in Cantonese presents another problem to Yip and Barrie's analysis. The issue is most clearly illustrated in attenuatives, where the second reduplicative copy ends with a high tone:

(3) Cantonese attenuatives

a.	syn55 'sour'	→ syn55 syn5$\underline{5}$ teɪ25	d.	hʊŋ21 'red'	→ hʊŋ21 hʊŋ2$\underline{5}$ teɪ25
b.	jiu25 'girly'	→ jiu25 jiu2$\underline{5}$ teɪ25	e.	k^hɐn23 'near'	→ k^hɐn23 k^hɐn2$\underline{5}$ teɪ25
c.	ts^hi33 'similar'	→ ts^hi33 ts^hi3$\underline{5}$ teɪ25	f.	kuʏ22 'tired'	→ kuʏ22 kuʏ2$\underline{5}$ teɪ25

The unified analysis for tonal alternation in (3) is a floating-tone analysis as in Yip (1980) and Chen (2000). Essentially, with the assumption that both tonal onset and offset are specified, a floating high tone docks to the right of the syllable concerned and leads to the deletion of the tonal offset of the original tone. With Barrie's representations of Cantonese tones, for instance, it is puzzling as to how a unified analysis for (3) could be advanced. Specifically, if the high-rising tone (derived or not) were [+upper, −raised, contour], how then could a single analysis (i) derive [+upper, −raised, contour] from the non-derived tones 33, 21, 23, and 22 in (3c-f) which are all formally distinct in terms of [±upper], [±raised], and [contour], as well as (ii) deal with the non-derived tones 55 and 25 in (3a-b) as if they were unaltered? The upshot is, again, that Cantonese contour tones should have two separate tonal targets.

Conclusions: Cantonese is another Southeast Asian language with an African tone system, similar to, for instance, Kuki-Thaadow (Hyman 2007), where contour tones are sequences of level tones, rather than unitary entities. The methodological take-home message is that we ought to analyze individual languages *solo* without the (implicit) assumption that related languages (e.g., Chinese languages) somehow share the same grammar (Matthews 1999, Yue-Hashimoto 1993).

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