More on the Representation of Contour Tones

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In LTBA IV.I Gandour and Fromkin (1978, cf Gandour 1975) draw attention to an alternation of tone in the Tai dialect of Lue (Li 1964) which may provide crucial evidence in favor of the representation of contour tones as indivisible units rather than as sequences of level tones. They propose that the analysis of this alternation is both simpler and more insightful if unit-contour features are posited. The advantages they claim for their solution are open to question.

Briefly stated, Li reports that there are six contrastive tone patterns on Lue syllables. Five of these do not alternate. These are three level tones, transcribed [55], [33], [22], a mid-low falling contour [31], and a mid-high rising contour [25] which is represented as [35] by Gandour and Fromkin. The sixth pattern is reported as a low-mid rising contour [13], alternating with a low level [11]. The low level variant appears before the mid-high or mid-low contours, but the low-mid rising contour appears before a level tone or pause. Gandour and Fromkin suggest that the correct way of viewing this distribution is as the product of a dissimilation process: Before a contour tone a level variant appears, but before a level tone a contour variant appears. To formulate the rule describing this dissimilation process, a feature must be available to categorize tones as level or contour, e.g. as [- CONTOUR] or [+ CONTOUR]. Using the features proposed by Wang (1967), the Lue tones would be specified as in (1).

(1)

	55	33	22	31	35	13	11
HIGH	+	-	-	-	+	-	-
CENTRAL	-	+	+	-	-	-	-
MID	-	+	-	-	-	-	-
RISING	-	-	-	-	+	+	-
CONTOUR	-	-	-	+	+	+	-

If the rising variant [13] is taken as the underlying tonal value in the alternating syllables, then the rule can be written as (2).

(2) $\begin{bmatrix} - \text{ HIGH} \\ + \text{ RISING} \end{bmatrix} \longrightarrow [\ -\ \text{CONTOUR}]\ /\ \_\_\_\ [\ +\ \text{CONTOUR}]$

As Gandour and Fromkin point out, this rule states directly and simply that a low-mid rising contour becomes level when immediately preceding another contour tone. But whether this is an insightful, or in fact an observationally adequate account of the alternation depends on some information that is lacking in Li's article. Notice that the rule (2) will change the sequence [13] [13] to [11] [13]. Li only reports that the level variant appears before [31] and [35]. Unless the low-mid rising tone itself also triggers the change to level there is no dissimilation process to be captured, and the rule would instead be as in (3).

(3) $\begin{bmatrix} - \text{ HIGH} \\ + \text{ RISING} \end{bmatrix} \longrightarrow [\ -\ \text{CONTOUR}]\ /\ \_\_\_\ \left\{ \begin{bmatrix} + \text{ HIGH} \\ + \text{ RISING} \end{bmatrix} \right\} \left\{ \begin{bmatrix} - \text{ RISING} \\ + \text{ CONTOUR} \end{bmatrix} \right\}$

Here the representation of contours with unit-contour features does not seem to be contributing to an insight since the class [+ CONTOUR] does not function in rule (3). Instead the environment is simply the disjunction of the mid-high rising and mid-low falling patterns.

Assuming that the distribution of the [11] and [13] variants is as (3) states, an attempt to rescue a dissimilatory explanation can be made by reversing the assumption about which of the variants is underlying. In this case Lue would have four underlying level tones and only two contours. The contour variant [13] would be derived by rule whenever a level tone followed an underlying [11] tone. Note that the rule would also have to effect the same change when a pause followed, and also that [13] [13] would be derived from the underlying sequence [11] [11]. Using the features in (1), the rule would have the form given in (4).

(4) $\begin{bmatrix} - \text{ HIGH} \\ - \text{ CENTRAL} \\ - \text{ RISING} \end{bmatrix} \longrightarrow [\ + \text{RISING}] \ / \ \_\_ \ \begin{Bmatrix} [\ - \text{CONTOUR}] \\ \text{Pause} \end{Bmatrix}$

Although the class [- CONTOUR] functions in the environment for rule (4), the rule, unlike rule (2),does not formally effect a dissimilation of the feature [CONTOUR]. However, if the feature inventory in (1) is revised by discarding the feature [RISING] in favor of the feature [FALLING] and the appropriate changes in other feature values are made, a rule which does formally represent a dissimilation can be written, namely (5).

(5) $\begin{bmatrix} - \text{ HIGH} \\ - \text{ CENTRAL} \\ - \text{ FALLING} \end{bmatrix} \longrightarrow [\ + \text{CONTOUR}] \ / \ \_\_ \ \begin{Bmatrix} [\ - \text{CONTOUR}] \\ \text{Pause} \end{Bmatrix}$

This works because, with the substituted feature, a tone which is specified [+ CONTOUR, - FALLING] is a rising tone. In (4) the feature [- RISING] must be changed to [+ RISING] because a tone which is [+ CONTOUR, - RISING] is a falling tone. There cannot be three *distinctive* features [RISING], [FALLING] and [CONTOUR] because given any two of these the third is entirely redundant, hence never distinctive. In other words, the description of the process involved in Lue tone alternation becomes an artifact of an essentially arbitrary choice between features. This is doubtful evidence to use for justification of the features involved.

In addition to the problem of arbitrariness, both of the solutions (4) and (5) require the unmotivated change of a low level tone [11] to low-mid rising [13] before pause, and consequently the unnatural disjunction of level tones and pause in the environment. These problems are not present if the distribution of the variants is as rule (2) states, i.e. the sequence [11] [13] occurs and not [13] [13]. Thus the claim that unit-contour features permit an otherwise unrepresented insight into this linguistic system to be captured depends on which of these sequences does occur. Yet this is undocumented; Li does not say which of the variants appears before [13].

Let us now turn away from assessing the difficulties in the way of accepting the unit-contour solution and consider the objections that are raised against a non-unitary analysis of the contours. Gandour and Fromkin compare their preferred solution with one using only levels. They convert Li's numerical notation directly into sequences of levels. Thus [31] is translated as a mid tone followed by a low tone, and [33] is also converted

into a sequence, of a mid tone followed by a mid tone. Because of this, the change from [13] to [11] is regarded by them as a change in the second element of a sequence from mid level to low level. Their rule, using a feature system proposed by Woo (1969), is given as (6). Note that this rule is written so that [13] is not changed before another [13] (unlike rule (2)).

(6) $$[\ -\ \text{LOW}] \longrightarrow [\ +\ \text{LOW}]\ /\ [\ +\ \text{LOW}]\ \_\_\_\ [\ -\ \text{LOW}] \begin{Bmatrix} [\ +\ \text{HIGH}] \\ [\ +\ \text{LOW}\ ] \end{Bmatrix}$$

Gandour and Fromkin dismiss (6) with the remark that "the complexity and phonetic implausibility of this rule obscure the simple tonal process underlying this alternation". In fact the rule represents a perseverative assimilation, which is not an implausible process but a very commonly encountered one. The implausibility may be thought to lie in the disjunction of [+ HIGH], [+ LOW] in the environment, but this is a consequence of the decision to use Woo's system of tone features which does not provide any way of identifying the set of 'non-mid' tones. Most alternative feature sets do provide a simple characterisation of the required set of tones, as for example [- Mid] in the features proposed by Fromkin (1972).

In preference to (6) the following account can be proposed, which seems both explanatory and formally straightforward. First, it is redundant to treat the level tones as sequences; they should be represented as single tones. The notation [55], [11] etc was developed to reflect a difference between syllable types, [55] being written to represent a high level tone in a long syllable and [5] to represent a high level tone in a short syllable (usually one with a final stop). The distinction is not one of tone, and besides is irrelevant to Lue. Now, the simplest way of viewing the alternation of tone in Lue is to say that in the level variant the second element of the low-mid sequence is deleted, i.e. [13] → [1]. Using the three features [HIGH], [LOW] and [EXTREME] (Maddieson 1970), the tones and tone sequences of Lue would be distinguished from each other as in the matrix (7). (The feature [EXTREME] is the inverse of but is preferred to a feature [MID], cf Anderson 1978).

(7)

	5	3	2	3 5	3 1	1 3	1
HIGH	+	-	-	- +	- -	- -	-
LOW	-	-	+	- -	- +	+ -	+
EXTREME	+	-	-	- +	- +	+ -	+

The alternation simplifies the four-tone sequence [1331] to [131] and [1335] to [135]. In other words two adjacent tones in the mid range coalesce when flanked by [+ EXTREME] (nonmid) tones. This is an extremely natural process which merely modifies the relative timing of a change in pitch and the articulation of the segments in the relevant syllables. This kind of process is very commonly found in tone languages (Hyman and Schuh 1974) and this occurrence is open to a functional explanation in terms of the difficulty of distinguishing basically similar patterns such as [1331] and [131] on the same number of syllables. One possible formulation of the needed rule is given as (8).

(8) $$[\ -\ \text{EXTREME}] \longrightarrow \emptyset\ /\ [\ +\ \text{EXTREME}]\ \_\_\_\ [\ -\ \text{EXTREME}]\ [\ +\ \text{EXTREME}]$$

If [1] and not [13] occurs before another [13] then the rule is merely one which says that [13] simplifies to [1] before any tone sequence other than

itself. This can be formulated as (9).

(9) [- EXTREME] ⟶ ∅ / [+ EXTREME] ___ [α EXTREME] [-α EXTREME]

It thus seems that a straightforward and natural account of the Lue data can be given without any need to posit the unity of contours. As a theory which posits only level tones is more parsimonious than one which includes unit contours, stronger evidence than that provided by Lue should be required before accepting the unity of contours. The interesting argument that Lue displays a dissimilation with respect to the feature [CONTOUR] remains less than convincing.

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