THE NON-UNIQUENESS OF TONE SPLIT: AN EXPLANATORY CHALLENGE

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1. Introduction

In the field of comparative and diachronic Tai, scholars have been struggling over decades to find phonetic motivations for tone splits. The basic hypothesis is that tone splits represent phonologization of pitch perturbations associated with the articulation of initial consonants, such as higher initial pitch after voiceless initial, lower initial pitch after voiced initial. Such phenomena seem to occur universally though their extent may differ, and they are not limited to stops but have been observed even with sonorants (Maddieson 1983, cf. also Thongkum 1993).

The present paper[1] adresses some much-debated but still controversial issues. I shall first argue that tonal flip-flop cannot be explained phonetically as something happening at the time of the initial tone split. Subsequently, I shall add to the already vast literature on tone split by exploiting the potential of functional explanations.2 Despite the general embracement of pitch perturbation as the basis of tone split there is no definitive phonetic (articulatory, aerodynamic) explanation of the modified pitches after initial consonants which have been documented instrumentally. In my view it remains equally controversial (in spite of good discussion in House and Svantesson 1996) why and how pitch modifications developed into independent phonetic features with a potential for phonologization.

If pitch perturbation is just an automatic phonetic phenomenon accompanying articulatory states (rather than a more autonomous, truly allotonic phenomenon), one question is why the pitch-perturbating effect of an initial consonant did not simply adjust to changing aerodynamic conditions in case of ongoing consonant mutation. Another question is how such

pitch phenomena could be perceptually dissociated from initial segments and enter the realm of syllable rhymes so as to affect the tone inventory.

A perceptual transformation of consonant-related pitches into syllable tones presupposes high salience of the pitch phenomena in the first place. It seems a plausible hypothesis (in the light of research by Arthur Abramson and others, cf. Abramson and Erickson 1992) that phonetically-based raising or lowering of pitch with different types of consonants has from the outset had a communicative function as a cue to type of initial, much as vowel duration in English cues the difference between "voiced" and "voiceless" finals.

For the understanding of tone split it is an even more significant question to what extent the degree of pitch modification after different types of initials is universal or language-specific. There is solid evidence for the latter; thus it was convincingly demonstrated by Amon Thavisak at the SEALS XI Conference (2001) that there is no universal solution to the pitch-cued subgrouping of aspirated versus unaspirated consonants (and hence to tone split between these). This suggests that the pitch movement associated with an initial consonant type is not just a concomitant feature but can be programmed so as to enhance the discriminatory effect of this cue vis-à-vis other manner-cues, and even to exploit it arbitrarily so as to keep categories distinct in some fashion or other. Such a functional hypothesis is called for in order to explain how pitch movements can follow their own course, survive the coalescence of other cues and take over the full burden of lexical distinctions associated with syllable types.

In tonogenesis "from scratch" it is difficult to see how a speech community would perform the cognitive jump from associating pitch with a syllable onset to associating it with the rhyme. Researchers are increasingly inclined to believe that tonogenesis normally happens via an intermediate phonation type (register) difference such as breathiness versus modal voicing. That has the dual effect of enhancing the pitch contrast and affecting the vowel more, thus facilitating the association of pitch with the rhyme. In tonal languages, however, phonation

type is not such a crucial precursor to tone split since perceptually salient pitch-related phenomena would tend to be integrated with the contours of lexical tones, creating distinct allotones and paving the way for tone split.

2. Tonal "reversal"

The most obvious paradox is the reversal of the expected pitches which one can observe in many dialects of SWT, with a mid or high tone as the reflex of old voiced initials, and even worse: a tone which starts quite low as the reflex of old voiceless initials; a similar scenario has been stated for two Loloish languages by Matisoff, who has spoken of "tonal flip-flop" (Matisoff 1972, pp. 5-9). Clearly that is the very opposite of what one would like to find if one adheres to a strict version of the pitch perturbation hypothesis.

In the early years of the tone-split debate Marvin Brown suggested two explanatory models involving totally different underlying phonetic mechanisms. His more recent model (Brown 1975) rests on the assumption that since the frequency drop accompanying a *voiced initial is followed by a rising pitch there might occur an overshoot giving the impression of a raised rather than a lowered pitch. This is not corroborated by general phonetic theory, and it is quite implausible that it could account for the existence of two opposite tonal trends in SWT dialects.

Brown's former assumption (Brown 1965: 53-54) was that there were alternative ways of producing e.g. aspirated voiceless stops, with quite different pitch-modifying effects. Brown made explicit that this was not based on empirical evidence. It is, however, an ingenious hypothesis, not least considering that he proposed it before it became fashionable in phonetic research to look at both pitch perturbation and "stiff" versus "slack" vocal cords. As the scenario is understood today, however, it is a reasonable point of departure that the consonant mutations conditioning tone split started not with the devoicing of *voiced stops but with the voicing of *voiceless sonorants (there is evidence for this for Tho, cf. Thongkum 1997: 215). That is, tone split may have started in syllables with initial sonorants.

It is hard to see how *voiceless sonorants could ever lower

the pitch for purely physiological reasons. One way out is to speculate that they developed an intermediate, breathy or slack phonation type as a first step toward coalescence with the modally voiced sonorants. There is no corroboration of this, but the really controversial thing about such a physiological explanation of tonal flip-flop is that *it only accounts for a subset of words*. In this case, we are still at a loss explaining the tonal behaviour of words with *aspirated stops: their initials remained voiceless aspirated in all dialects and thus had no reason to depress the pitch in the first place.

I wish to conclude that tonal flip-flop in northern SWT is not a direct reflex of the operation of phonetic factors at the time of tone split. It may be the reflex of an abstract (in the terminology used here: cognitive) generalization across onset types within the "High" consonant category, or it may be an entirely secondary phenomenon, a gradual flip-flop resulting from the later drifting of contour tones within the tonal space. We can just observe that this type of tonal behaviour is a local innovation which spread to neighbouring dialects and languages (cf. its occurrence in Loloish).

3. Consonant categories and tone split

Everybody now agrees that Thai tonology can be described and discussed adequately with reference to a two-dimensional matrix where the X-axis is divided into six columns according to types of syllable-rhymes ("Live", i.e. unchecked syllables with three proto-prosodies: unmarked, *máy èek* and *máy thoo*, and "Dead", i.e. checked syllables with long versus short vowels: *DL*, *DS*), and the Y-axis is divided into three - or more correctly four - rows according to types of initials (cf. Brown 1965, Gedney 1972, etc.). The remarkable fact is that *if two monosyllabic words belong etymologically to the same slot in the matrix they normally stay together forever across the dialects of SWT*. Slots may fall together, but the members of one slot rarely part company. For the most part this association of lexemes (etyma) with particular slots in the tonal matrix even goes back to a stage prior to the split-off of SWT from the rest of the Tai family.

From a comparative Tai perspective the prosodic relevance of this fixed categorization of etyma now seems to be taken as a