THE GREAT TONE SPLIT: DID IT WORK IN TWO OPPOSITE WAYS?

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The great tone split was a sound change that swept through China and northern Southeast Asia nearly a thousand years ago. It was probably the 'greatest' sound change we have record of today, for it affected almost all of the words of almost all of the languages of this vast area. (Indeed, it makes the 'great vowel shift' of English, by comparison, seem unworthy of the name.) Simply put, voiced, glottal, and aspirate initial consonants split all existing tones in two (or three) and then partially coalesced, thereby shifting some laryngeal distinctions from initials to tones. A typical example is shown below.

\[
\begin{align*}
\text{phaa} & \quad \rightarrow \quad \text{paa} \\
\text{paa} & \quad \rightarrow \quad \text{bàa} \\
\text{bàa} & \quad \rightarrow \quad \text{phàa}
\end{align*}
\]


There seems to be complete agreement in the literature on how different consonant types go about splitting tones: voiced initials tend to lower tones and aspirate initials tend to raise them; and the tones with glottal initials get drawn one way or the other (giving two different levels for the old tone) or else stay in between (giving three). We might call this the 'voiced-low, aspirate-high' (or V-L) effect. There are three main types of evidence for this.

1) The tone systems of modern languages. Haudricourt (1972) gives the following two tone systems as perfect examples of the V-L effect. (For easier comparison of relative pitch levels, the modern reflexes of the same ancient tone are shown in the same box of reference lines. Dotted lines show tones from aspirate and glottal initials, and solid lines show tones from voiced initials.)

Cantonese

\[
\begin{array}{c|c|c|c}
\hline
\text{Initial} & \text{Tone 1} & \text{Tone 2} & \text{Tone 3} \\
\hline
\text{Voiced} & \text{Low} & \text{Medium} & \text{High} \\
\text{Aspirate} & \text{Medium} & \text{Low} & \text{High} \\
\text{Glottal} & \text{High} & \text{Medium} & \text{Low} \\
\end{array}
\]

Sgaw-Karen

\[
\begin{array}{c|c|c|c}
\hline
\text{Initial} & \text{Tone 1} & \text{Tone 2} & \text{Tone 3} \\
\hline
\text{Voiced} & \text{Low} & \text{Medium} & \text{High} \\
\text{Aspirate} & \text{Medium} & \text{Low} & \text{High} \\
\text{Glottal} & \text{High} & \text{Medium} & \text{Low} \\
\end{array}
\]

A slightly less perfect example showing a three-way split is the Nakhon Sriathammarat dialect of Southern Thai. A slight reconstruction which makes the example perfect is shown to the right. The Southern Thai dia-
lect of Satun is added in the middle as additional evidence for the reconstruction. Dotted lines show tones from aspirate initials; dashed lines, glottal; and solid lines, voiced.

Nakhon Srithammarat  Satun  Reconstruction

The source for these Southern Thai dialects is my book *From Ancient Thai to Modern Dialects* (hereafter referred to as AT).

2) **High-Mid-Low terminology in reference to classes of letters.** The Thai system of writing was clearly devised to fit a language that had not yet undergone the great tone split, and to give rules for its use with a post-split language like modern Thai it is necessary to classify the consonant letters by their ancient sounds. The traditional terminology for these classes is Low (for ancient voiced consonants), Mid (for ancient glottals), and High (for ancient aspirates).

3) **Actual pitches following voiced and aspirate initials in various languages.** The lower starting point of tones and intonations following voiced consonants has long been noted. English 'pin' and 'bin' spoken with falling intonation, for example, usually have actual pitch shapes as indicated below.

\[
\text{pin} \\
\text{bin}
\]

Erickson (1974b) has made systematic measurements in modern Thai which clearly bear this out. This tendency seems to be so universal, in fact, that some would call it not only natural but even a necessary resultant of the way the larynx works. Matisoff (1973) seems to imply this.

To sum up the evidence, 1) there are some perfect examples of V-L among modern languages, 2) there is at least one case where a language actually uses the word 'low' to name the letters for ancient voiced sounds and 'high' to name the letters for ancient aspirates, and 3) the V-L effect seems to be completely natural. It is, indeed, very convincing, and I am quite prepared to accept it—for Cantonese, Sgaw-Karen, Southern Thai, and for the language of the people who started the High-Mid-Low terminology, that is.
But to apply evidence from some of the languages that underwent the great tone split to all of them is another matter. There is, in fact, considerable evidence that points to precisely the opposite effect in some languages, namely 'voiced-high, aspirate-low' (V-H). And this is what I propose to investigate here.

2. A closer look at the evidence from modern dialects.

a. The direction and limits of 'collapse' or 'erosion'. After Haudricourt (1972) presents the tones of Cantonese and Sgaw-Karen and points out the V-L effect, he says, 'However, once it is established, the tonal system evolves without regard for its old etymological pitch levels', and then proceeds to give about 30 more tonal systems without any comment on their V-L nature.

But 'evolving without regard for old etymological pitch levels' doesn't mean evolving without direction or limit. Everything in the universe has direction and limit: the direction eventually overriding all others is that from order to randomness (increase in entropy) and complete randomness is the limit. Correlations must have reasons--forces that keep them from randomness. If the force is removed, the correlation will immediately start to collapse and approach randomness --but it won't go beyond. If all black cars, and no others, were given licence plates ending in 2, there would be a correlation between licence plate numbers and black color. If this policy were then discontinued, the percentage of black cars having licence plates ending in 2 would decrease from 100 percent to 10 (randomness or zero correlation), and there it would stop. It couldn't continue on down to 9, 8, 7, etc. (The direction down from 10 percent would be 'uphill' towards the opposite correlation.) Similarly, if the great tone split produced 100 percent V-L tones (as with Cantonese), this correlation would eventually wear down to 50 percent V-L (randomness or zero correlation), and there it would stop. Except for an occasional dialect, it couldn't 'wear down' to 25 percent. (The direction down from 50 percent would, again, be 'uphill' towards the opposite correlation.) And if we found whole branches of dialects with 25 percent V-L, we couldn't explain this as the wearing down, 'erosion', or 'collapse' of a V-L correlation.

b. Measuring degrees of V-L and V-H. The meaning of 100 percent V-L seems clear enough for Cantonese, but what does it mean to say that Standard Thai is 83 percent V-H? Or that the Northern Thai Branch is 79 percent V-H? A few special symbols are needed to see exactly what is to be compared with what and how these comparisons are to be interpreted in percentages.

I will use 0, 1, and 2 for the three ancient tones (for 'unmarked', máy ?ëek, and máy thoo, respectively, in Thai writing) and V and A for ancient voiced and aspirate initials. A combination like V1 will then mean the modern tone in syllables that had ancient voiced initials and the ancient 'number 1' tone. Relevant tonal comparisons will be shown as below.
VO \lor AO \quad \text{means that the VO tone is lower than the AO tone and is thus evidence for } V-L.
V1 \land A1 \quad \text{means that the V1 tone is higher than the A1 tone and is thus evidence for } V-H.
V2 = A2 \quad \text{means that the V2 tone has the same level as the A2 tone (or that the two tones aren't comparable) and is thus evidence for neither } V-L \text{ nor } V-H.

If the three tonal pairs in a language were as shown in this example, then it would be 50 percent V-L and 50 percent V-H, since one of the three pairs shows V-L, one shows V-H, and one shows neither. All possible combinations together with their V-L and V-H percentages are shown below. (2V \lor A, for example, means that any two V tones are lower than their corresponding A tones.)

<table>
<thead>
<tr>
<th>V-L percentage</th>
<th>V-H percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>3V \lor A</td>
</tr>
<tr>
<td>83</td>
<td>2V \lor A</td>
</tr>
<tr>
<td>67</td>
<td>2V \lor A</td>
</tr>
<tr>
<td>67</td>
<td>1V \lor A</td>
</tr>
<tr>
<td>50</td>
<td>1V \lor A</td>
</tr>
<tr>
<td>50</td>
<td>3V = A</td>
</tr>
<tr>
<td>33</td>
<td>1V \lor A</td>
</tr>
<tr>
<td>33</td>
<td>2V = A</td>
</tr>
<tr>
<td>17</td>
<td>1V = A</td>
</tr>
<tr>
<td>0</td>
<td>3V \land A</td>
</tr>
</tbody>
</table>

The problem here, of course, is how do we tell which tone of a pair is higher. With Cantonese and Nakhon Srithammarat, the answer is obvious; but consider the hypothetical language shown below. A tones are dotted and V tones solid.

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0   1   2
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[Diagram]

We might decide to compare the starting points since the relevant conditioning factor was the initial consonants. Or we might compare the