Origins of Tones in Old Chinese

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Abstract

Modern reconstruction of Old Chinese, the language of the Shang dynasty, usually assumes that it had no tones, with modern tonal contrast represented instead by final consonants -s and -ʔ. It is further suggested that these consonants sometimes had a grammatical function. I discuss these two vaguely related topics.

1 Introduction

We motivate the discussion of a particular Old Chinese affix by noticing a particular correspondence among some Chinese morphemes. Consider the following pairs of morphemes (data from MDBG):

| 假 jiǎ ‘fake’ | 假 jià ‘vacation’ |
| 敎 jiāo ‘to teach’ | 敎 jiāo ‘teaching’ |
| 行 xíng ‘to travel, to do’ | 行 xìng ‘behavior’ |
| 興 xīng ‘to flourish, become popular’ | 興 xìng ‘interest, excitement’ |
| 傳 chuān ‘to pass on’ | 傳 zhuàn ‘a record’ |
| 卷 juǎn ‘to roll up’ | 卷 juàn ‘a book, scroll’ |
| 覽 guān ‘to watch, observe’ | 覽 guān ‘watchtower’ |
| 鑽 zuān ‘to drill’ | 鑽 zuàn ‘diamond’ |
| 圍 juān ‘to confine’ | 圍 juàn ‘pigpen’ |
| 媛 yuān ‘beautiful (of a woman)’ | 媛 yuàn ‘beauty’ |

Each of the pairs is written with the same character, and the only major difference in pronunciation is the tone. The verb meaning takes the 1st, 2nd, or 3rd tone, while the noun meaning takes the 4th tone. It seems there is something about tone that can change the meaning of a syllable.

There are other characters, however, for which the opposite effect take place. For example:

| 語 yǔ ‘language, speech’ | 語 yù ‘to tell to’ |
| 雨 yǔ ‘rain’ | 雨 yù ‘to rain’ |
| 興 xīng ‘to flourish, become popular’ | 興 xìng ‘interest, excitement’ |
| 冠 guān ‘hat’ | 冠 guàn ‘to put on a hat’ |

Of most of these pairs, one of the pronunciations of meanings has either fallen out of use. This is no accident. According to Baxter, character pronunciations tend to gravitate toward a single tone. For example, 假 is nowadays often pronounced in the third tone, even when the noun meaning is desired.

If this is true, then the stage in which one character is read with multiple tones is a temporary one. In Middle Chinese, however, neither the tones merge, nor the pronunciations split - the character readings are often still homophonous with one reading in the 去 tone, the other in any of the other three tones.

We now have an explanation to this puzzle. The two pronunciations originally were pronounced differently: the morpheme one on the right was derived from the one on the left by an affix, most likely
which functioned, in part, as a noun-forming grammatical particle. We also suspect that at the time
of the -s Chinese was not a tonal language like Middle Chinese or modern varieties. Tonal categories
were instead distinguished by final consonants, which later disappeared and gave way to tones. The -s
disappeared and resulted in a 4 tone in Middle Chinese, which we call the 4th tone in Mandarin.

In this paper, I discuss both the evidence for the original lack of tones and for the endings -s and
that were in their place, as well as the grammatical functions of -s and -? when they functioned as
grammatical affixes. I start by discussing the creation of tone in general, using Vietnamese as an example.
I then discuss various evidence for -s and -? in Old Chinese. Later, I give an overview of the grammatical
functions of -s as cited in modern reconstructions. Finally, I give some concluding remarks about the
study of Old Chinese in general.

2 Tonogenesis in East Asia

Lexical tone is not purely a hereditary property of languages in language families. Atonal languages can
develop tone over time in a process we refer to as tonogenesis. I will discuss two examples, both relevant
to the study of Old Chinese.

2.1 Vietnamese

Vietnamese belongs to the Astroasiatic family of languages. It is a tonal language, but other languages
in the Austroasiatic family are atonal. Consider these examples (data from SEALang):

<table>
<thead>
<tr>
<th>Vietnamese</th>
<th>Khmer</th>
<th>Mon</th>
<th>Wa</th>
</tr>
</thead>
<tbody>
<tr>
<td>pig</td>
<td>cúi</td>
<td>cruuk</td>
<td>klok</td>
</tr>
<tr>
<td>water</td>
<td>nước</td>
<td>tik</td>
<td>daik</td>
</tr>
<tr>
<td>house</td>
<td>nhà</td>
<td>kruə</td>
<td>hər?</td>
</tr>
<tr>
<td>nose</td>
<td>mũi</td>
<td>cramoh</td>
<td>muh</td>
</tr>
<tr>
<td>mosquito</td>
<td>muoi</td>
<td>muuh</td>
<td>hamit, hamic</td>
</tr>
<tr>
<td>seven</td>
<td>biy</td>
<td>hapoh</td>
<td></td>
</tr>
</tbody>
</table>

The fact that Vietnamese cooccurs with atonal languages suggests that it has, at some point in the
past, also been atonal. We notice a few similarities. For example, some of the tones correspond to a -k
ending in other languages, some correspond to the -h ending, for some the pattern is not immediately
obvious.

The study of Vietnamese tonogenesis by Haudricourt, as described in Matisoff, concluded that Viet-
namese tones emerged from three groups, corresponding to open vowel or nasal endings, -s endings, and
stop endings. Early on, the stop endings changed to glottal stop endings and -s changed to -h. Because
of acoustics, syllables with -s or -h endings are naturally pronounced with a falling pitch, while syllables
with stop endings are pronounced with a rising pitch. As Vietnamese lost its endings, the pitch distinc-
tions became phonemic, and Vietnamese became a tonal language with three tones: level, falling, and
rising. Later, as Vietnamese lost the distinction between voiced and voiceless initials, the three tones
split into six based on whether the initial consonant was voiced or voiceless. The process is summarized
in the table below:

<table>
<thead>
<tr>
<th>early Vietnamese</th>
<th>pa</th>
<th>ba</th>
<th>pas</th>
<th>bas</th>
<th>pak</th>
<th>bak</th>
<th>pitch is not phonemic</th>
</tr>
</thead>
<tbody>
<tr>
<td>6th century</td>
<td>pa</td>
<td>ba</td>
<td>pah</td>
<td>bah</td>
<td>pa?</td>
<td>ba?</td>
<td></td>
</tr>
<tr>
<td>12th century</td>
<td>pa</td>
<td>pà</td>
<td>pà</td>
<td>pà</td>
<td>pà</td>
<td>pà</td>
<td>three phonemic tones</td>
</tr>
<tr>
<td></td>
<td>pa</td>
<td>pà</td>
<td>pà</td>
<td>pà</td>
<td>pà</td>
<td>six phonemic tones</td>
<td></td>
</tr>
</tbody>
</table>
In Modern Vietnamese, these tones are called ngang, huyền, hỏi, ngã, sắc, and nạng. In other languages, the stops remained, and the -s changed into -h. In these languages, pitch differences may be present but are not phonemic.

2.2 Tibetan

Tibetan belongs to the Tibeto-Burman branch of the Sino-Tibetan family of languages. Its varieties include tonal varieties (such as Lhasa Tibetan) and atonal ones. Maran conjectured that Tibetan was originally atonal, and furthermore, that of the modern languages in the Tibeto-Burman branch, there are representatives for several stages for tonogenesis. Maran proposed the following model.

1. Language is completely atonal, pitch differences, if any, are not cognitively processed
2. Language attains pairwise contrasts of finals (e.g. -t/-n, -k/-ŋ), but language is still atonal
3. The peak at which language has pairwise contrasts between finals, tone may function as a secondary feature
4. Tone takes over as the contrasting feature, and finals lose their contrasts
5. Language loses its finals and tone is completely phonemic

2.3 Tones and Chinese

The Tibetan and Vietnamese models have a lot in common. In both models, language starts out as atonal and with initial or final consonant contrast, which have secondary acoustic pitch features. Over time, the contrasts are lost, and pitch becomes phonemic.

We understand very well that from Middle Chinese onward, tone has developed in the Chinese languages according to the same principles. Like in Vietnamese, Chinese tones after Middle Chinese split into two (陰 yīn and 阳 yáng) based on the voicing of the initial consonant.

Moreover, early borrowing from Chinese into Vietnamese exhibits a tonal correspondence: Middle Chinese 平 tones correspond to ngang and huyền, 上 tones correspond to hỏi and ngã, and 去 tones correspond to sắc and nạng. In the time of Middle Chinese, this would have been a correspondence between level tones and level tones, rising tones and rising tones, falling tones and falling tones. This is logical. However, older borrowings were into an atonal language.

It is conjectured by Baxter and others that, like early Vietnamese, Old Chinese was atonal, and Old Chinese endings -P and -s > -h have evolved into Middle Chinese 上 and 去 tones. Schuessler’s etymological dictionary of old Chinese reconstructs 觀 guăn as deriving from Middle Chinese kuăn 平 and from Old Chinese *kôn. It reconstructs 觀 gu` an as deriving from Middle Chinese kuăn 去 and Old Chinese *kôns.

2.4 Further evidence for -P and -s

Our understanding of Old Chinese realizations of Middle Chinese tonal categories is not restricted to Vietnamese. In foreign borrowings into Chinese, the -s is represented by a 去 tone character. Baxter provides a few examples from Pulleybank:

波羅奈 bōluònài ‘Varanasi’ from Sanskrit Vārāṇasi
對馬 duìmǎ ‘Tsushima (island of Japan)’ from Japanese Tushima

There is only very slight evidence from loanwords for the -P, but there is a relationship between Chinese and Sanskrit that suggests that 上 tones used to be pronounced short. According to Mei, in some Buddhist texts, a set of phonetic characters were used to write Sanskrit. One text instructed the reader to pronounce those characters representing short Sanskrit syllables in the 上 tone, rather than the typical
reading. Other texts had notes instructing the reader to pronounce short Sanskrit syllables in the 上 tone and long Sanskrit syllables, typically, in the 去 tone. Here are a few examples (illustration from Mei).

The first two use 长 ‘long’ and 短 ‘short’ to represent vowel length, the second two use 上 and 去.

Another piece of evidence comes from a description of tonal traditions of reading Chinese characters in Japan by a monk Annen, written in 880 CE. It discusses the Piao reading, in which the level (平) tone was said to be level and low, and the rising (上) tone level and high. The departing, 去 tone, is said to be drawn out, which is consistent with its use to represent long Sanskrit syllables. In a later discussion of the Chin and Cheng readings, the Chin reading is said to have an abrupt pronunciation of the 上 tone. This is further evidence that 上 was pronounced short, at least in some regions of China.

Syllable length is important, as it hints at the final consonant. An -s or -h makes a syllable longer and “drawn out”, while a stop makes a syllable shorter. (The latter should be evident from 入 tones.) Mei argues that syllable length is not contrastive in Chinese. If Chinese was tonal by the time of the Japanese document, there would unlikely be a length contrast. The document therefore suggests that the consonantal features had occured and may have been lost around 800 CE.

Finally, a few dialects of Min Chinese appear to preserve the -s ending in the 上. Unlike other major dialect groups of Chinese, Min did not go through Middle Chinese, so it is possible in Min for some ancient features to be preserved.

3 The -s final

In the introduction to this paper we discussed the correspondence between Mandarin 4th tone and non-4th tone readings of characters, wherein the non-4th tone reading corresponds to a verb, and the 4th tone reading corresponds to a noun. This pattern is not unique to Modern Mandarin. All but the first two have nasal endings, which means they derive from the 去 tone in Middle Chinese, and therefore an -s in Old Chinese.
It is believed that -s is an Old Chinese derivational morpheme. In our examples, it functions as a nominalizer. However, it has many other uses. Downer lists eight classes of syllable pairs where -s functions in a distinct way. I list the classes and give a few examples.

1. Verb to noun

高 kAu ‘to be tall’ 高 kAu ‘height’
過 kAu ‘to pass’ 過 kAu ‘excess’
把 pa ‘to grasp’ 把 pa ‘handle’

2. Noun to verb

家 ka ‘family’ 嫁 ka ‘(of a woman) to marry’
道 dau ‘road’ 導 dau ‘to lead the way’
左 tsu ‘left side’ 佐 tsu ‘to assist’

3. Verb to causative verb

觀 kuAn ‘to look at’ 觀 kuAn ‘to show’
買 mai ‘to buy’ 賣 mai ‘to sell’
借 tsjEk ‘to borrow’ 借 tsja ‘to lend’

4. Derived form has some sort of action

禁 kj@m ‘to overcome’ 禁 kj@m ‘to prohibit’
分 pju@n ‘to divide’ 分 pju@n ‘to distribute’
使 ş ‘to use, cause’ 使 ş ‘to send on a mission’

5. Derived form is specialized

告 kuok ‘to tell (superiors)’ 告 kuok ‘to announce (to inferiors)’
陳 djên ‘to line up’ 陳 djên ‘to line up in battle order’
厭 jEm ‘to be satisfied’ 厭 jEm ‘to be oversatisfied, tired of’

6. Verb to passive verb

知 tj ‘to know’ 智 tj ‘to be wise’
治 qi ‘to govern’ 治 qi ‘to be well-governed’
守 cjau ‘to guard’ 守 cjau ‘to be guarded’

7. Verb to adverb

更 k5N ‘to change’ 更 k5N ‘again, ‘even more’
並 bieN ‘to scatter, release’ 並 bieN ‘to be loose’
有 j@u ‘to have, exist’ 又 j@u ‘moreover, also’

8. Used in compounds

中 tjuN ‘middle’ 中分 tjuN ‘to divide in the middle’
夜中 ia tjuN ‘in the middle of the night’
出 tC h juez ‘to emerge’ 出 tC h juez ‘the rising sun’

This list is confusing. Some 去 tone verbs in the lists, for example, have second definitions as nouns. Downer admits that “the boundaries between... [group 4 and groups 3, 5] are somewhat nebulous”. We are left to wonder if there is a simpler or more informed classification of the various functions of -s.
4 Conclusion

In this paper I bring to light many insights into early Chinese notated, preserved and rediscovered by scholars. However, there is much more to be said about both Chinese tonogenesis and the functions of various affixes. I didn’t even talk about the functions of -ṣ, and the discussion of the functions of -s begs improvement. To demonstrate this, I give a quote by Schuessler:

Because tone C [לין] marked both passive and transitive / causative in early OC [Old Chinese] (down to ca. 700 BC), it was well on its way to becoming a weakly marked general purpose derivational morpheme in EOC [Early Old Chinese, mainly Shang], but it became ubiquitous later. In EOC, tone C [לין] nouns were passive (’to mount’ > ’what is mounted’ > ’carriage’) or exoactive. In later Zhou Chinese (by Chunqü times and later), it also formed nouns that were endoactive, e.g. cộng 從 [dziou][ yılı] ‘to follow’ > cộng 從 [dziou][liğini] ‘follower’... Thus tone C [לין] superceded tone B [_selector], the earlier marker of active voice, which ceased to be productive.

Schuessler has much more to say about -s and -ṣ: their successive functions as active voice markers, the variation in their meanings over time, and their eventual replacement by other grammatical features, to name a few. A comprehensive and coherent synthesis of all that is known about origins of tonal categories and the functions of their markers will take much more time and many more pages of text. For now, I leave the reader with this essay and myself with vast possibilities for further exploration.

References