Timing Tonogenesis: Evidence from Borrowing
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1. Introduction

There is one part of the received wisdom about tonogenesis in Southeast Asia that has puzzled me for years. I now think I have a useful way to think about it, one that may even be right. That problematic part of the received wisdom has nothing to do with Haudricourt's story (1954) of the segmental origin of tonal contrasts (via phonation contrasts, see Thurgood to appear) in the first instance from laryngeal contrasts in consonants at the back of the syllable (A-D), subsequently doubled by the merger of voiced and voiceless segments at the front of the syllable (1-2), as represented below:

(1)

	A (-0, -N)	B (-ʔ)	C (-s)	D (-p, -t, -k)
1 (voiceless initials)	A1	B1	C1	D1
2 (voiced initials)	A2	B2	C2	D2

I think there is ample evidence for this scenario, (1) from comparative evidence, (2) from phonation type traces of both the final laryngeal contrasts and the old initial voicing contrast, and (3) from languages of the area that have undergone the first wave of tonogenesis but not the later split. The problem has rather to do with the *propagation* of this "Sinospheric" four-by-two system of tonal contrasts. It has been claimed, explicitly by Paul Benedict, but implicitly by others, that this whole system of tonal contrasts (4 tones times 2 "registers") was borrowed from Chinese by Hmong-Mien, Tai and Vietnamese, all of which were originally atonal. Benedict writes "…Vietnamese, under direct Chinese domination lost the … initial syllables of MK [Mon-Khmer] *while directly borrowing the tonal system* … " (Benedict 1997: 4, emphasis added).

For those who are unused to thinking in terms of tone categories (A1, A2, B1, B2, etc.) as opposed to phonetic tones (high level, low rising, etc.), it is useful

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to think of them this way: all the words in a particular tonal category have a common historical origin in terms of final and initial consonantism (A1 = *voiceless initial, open syllable or syllable with a nasal coda). This insures that when the original consonantism is transphonologized into tone that all of the words belonging to each original category as defined by syllable type will continue to pattern together tonally. Although phonetic studies have shown that the newly emergent tones will have certain properties due directly to the type of consonant lost, once tones are created, they morph quite quickly into other things: originally high tones may lower, low tones may raise, tones may merge, contours may simplify, etc. Therefore words across languages in a family which belong to a particular tonal category may have quite different phonetic realizations. For example, within Hmong-Mien, words in the A1 category have a variety of different phonetic values: they are mid rising, high level, low rising, mid falling, and mid level. This cross-linguistic variability is true of every tone category. The categories themselves, on the other hand, are remarkably stable: in all Hmong-Mien languages, for example, the members of the group of cognates which includes "to give", "deep", "three", "thatch grass" and "snake" will all have *the same tone* in each language of the family (the A1 reflex), regardless of the phonetic value of that tone in any particular language.

The perfect tone category correspondences in Chinese loanwords from the Early Middle Chinese period are also somehow attributed to the fact that Hmong-Mien borrowed its four-by-two tonal system from Chinese. For example, Ying Lin (1972: 56), in an article on Chinese loans in Hmong-Mien, writes "If we compare these loans with *Qièyùn* rhyme tables, we find that the tones have been borrowed by Miao *primarily on the basis of the píng, shǎng, qù, and rù tone categories* (emphasis added).

(2)

			Early Middle Chinese	Proto-Hmong-Mien	Tone category[1]
金	*jīn*	'gold'	kim	cəm	A1
秧	*yāng*	'seedling'	ʔɨaŋ	ʔʐwɑəːŋ	A1
千	*qiān*	'thousand'	tsʰɛn	tθhjɪn	A1
蒸	*zhēng*	'steam'	tɕiŋ	tsuəːŋ	A1
雞	*jī*	'chicken'	kɛj	qəi	A1
銅	*tóng*	'copper'	dəwŋ	dɐəŋ	A2
羊	*yáng*	'sheep/goat'	jɨaŋ	ʐwɒəːŋ	A2

[1] Middle Chinese reconstructions are from Pulleyblank 1991 and Hmong-Mien reconstructions are from Wang and Mao 1995.

(2) cont.

			Early Middle Chinese	Proto-Hmong-Mien	Tone category[2]
牛	*niú*	'buffalo'	ŋuw	ŋɔːŋ	A2
銀	*yín*	'silver'	ŋin	ɳʷwɛːn	A2
桶	*tǒng*	'bucket'	tʰəwŋ'	thɛeŋ	B1
瓦	*wǎ*	'tile'	ŋwaɨ'	ŋwɑ	B2
馬	*mǎ*	'horse'	maɨ'	mnjuːn	B2
甑	*zèng*	'rice steamer'	tsiŋʰ	tʂaəŋ	C1
炭	*tàn*	'charcoal'	tʰanʰ	thaːn	C1
灶	*zào*	'stove'	tsawʰ	tsʊ	C1
箸	*zhù*	'chopsticks'	drɨaʰ	ɖəu	C2
漆	*qī*	'lacquer'	tsʰit	tθhjet	D1
百	*bǎi*	'hundred'	paɨjk	pɛk	D1
十	*shí*	'ten'	dʑip	ɻɑp	D2

At first, this seems reasonable for Hmong-Mien, because not only is there internal evidence of the development of the Sinospheric-type four-by-two tone system within Hmong-Mien, the languages in this family show the imprint of Chinese influence at every level of structure (Downer 1973, Ratliff 1999, 2000, 2001).

But this has always been the sticking point for me: How do speakers hear and borrow tone categories? How do speakers hear and borrow whole systems? There is nothing in the speech signal. And how does a borrowed word that has a particular niche within the donor language system, the historical antecedents of which were soon lost because the rise of tones *depends* on their being lost, embed that borrowing, in a perfectly analogous place, within a whole system that mirrors that of the donor language? Or to use another metaphor, how can the donor language regenerate an entire body around the transplanted borrowing, a body which is such a perfect clone of its mother that the borrowing comes to occupy the same relative position in the new body that it occupied in the old body?

In order to support the idea that system borrowing and borrowing on the basis of tone categories happened at a time in the distant past, one would ideally like to point to a modern-day contact situation which has recently yielded, or is in the process of yielding, a pattern similar to this one: identically structured systems, and borrowed words which occupy analogous places in the systems of both donor

[2] Middle Chinese reconstructions are from Pulleyblank 1991 and Hmong-Mien reconstructions are from Wang and Mao 1995.

and borrower language. I would like to review some recent situations where words have been borrowed under each logically possible combination of tonal and atonal donor and borrower languages to show that in three out of the four possible contact situations between donor and borrower — atonal donor and tonal borrower, tonal donor and tonal borrower, tonal donor and atonal borrower (the dominant theory) — all the known cases have yielded patterns quite different from this one. My conclusion is that, by elimination, and with the knowledge of how easily prosodic systems have diffused through Southeast Asia, it was the fourth contact situation — atonal donor and atonal borrower — which held at the time of these borrowings. According to Sagart, tones developed after Old Chinese but before Early Middle Chinese, so somewhere between 500 BCE and 500 CE (1999: 101). On the basis of the good segmental correspondences, the Chinese borrowings in Hmong-Mien above can be dated to only slightly before Early Middle Chinese, which we know was a tonal language, or to the first five hundred years of the Christian Era.[3] My argument will be that tonogenesis was ready to happen at this point, but it hadn't happened yet. And I will suggest that rather than it being the case Hmong-Mien took tone from Chinese, the languages of the Sinosphere "all went together".

2. Patterns of tone assignment in different contact situations

What were the logical possibilities at the time of borrowing, circa 0–500 CE? Let us take the four possible contact situations in turn, and look at the patterns they have yielded in the recent past.[4]

2.1. Donor atonal, Borrower tonal

For the case where the donor is atonal and the borrower is tonal, Jim Matisoff (2001: 321-32) reports that two variations of one basic strategy are employed in Southeast Asia: one or two common tones are selected as "loan-tones", or a rare tone is used as the loan-tone which instantly identifies the word as a borrowing (such as English borrowings in Lahu and Cantonese). In no reported case are all native tonal contrasts realized in words borrowed from an atonal language.

The "common loan-tone" strategy often involves an attempt to reflect stress or intonation contour in the donor language through tone. Christopher Court's study of Malay borrowings in Satun Thai (1975) indicates that the pitch correlates of stress and intonation are re-interpreted within a tonal context as tones. He reports that the high rising-falling tone of Satun Thai is used to represent the falling intonation on phrase-final open syllables in Malay loanwords. The high level tone

[3] Although Pulleyblank (1978) suggests that the development of tones was rather late, and that certain rhymes with final /s/ persisted down to the 6th century CE.

[4] Matisoff (2001) gives a very useful catalog of contact situations involving borrowing of words between tonal and atonal languages similar to this one. He also includes consideration of the relative prestige of donor and borrower.

is assigned to other syllables which do not occur at a point which corresponds to the Malay intonation peak. Jack Gandour (1979) also found a similar stress-to-tone mapping in a majority of English polysyllabic loanwords in Thai. Although the details are considerably more complex, in general borrowed polysyllabic English words are assigned a high tone on the syllable which receives stress in English.

Although Hmong speakers in the United States do not now transliterate nativized English borrowings into Hmong orthography which makes tone assignment easy to see (they simply use the English spelling), variation in early nativized loans show the same basic strategy: an attempt to mirror either English intonation or stress through tone assignment.

(3) 'America'

ɑmɛlikà	Mid-Mid-Mid-Low	(an attempt to represent English intonation)
àmèlǐkà	Low-Low-Rising-Low	(an attempt to represent English stress)
àmèlìkà	Low-Low-Low-Low	(loan-tone assignment)

So if Hmong-Mien had been tonal and Chinese had not been tonal at the time of the loans listed above, presumably all pre-Early Middle Chinese loanwords into common Hmong-Mien would have been realized with one or two tones: the then-current "loan-tones", either a common tone or two, or a rare tone. The tonal categories for all the loanwords of this stratum would then have belonged to a restricted subset of the eight across which native words are distributed, and would have been the same for all Hmong-Mien languages — which is clearly not the case.

2.2. Donor and Borrower both tonal

The "rare loan-tone" strategy may be used in the case of borrowings between tone languages (Matisoff 2001: 321). Bunu, for example, a Hmong-Mien language of Guangxi Province in China, assigns sandhi tones to Chinese and Zhuang borrowings, tones which are restricted in use in the native portion of the vocabulary. Apparently speakers feel that these minor tones are appropriate for marking all "special purpose" words — they are also used to mark baby-names such as 'little rat', 'little frog', etc. (Mao and Chou 1972, Meng 1983).

However, the strategy most often employed when one tone language borrows tones from another tone language is a phonetic mapping to the closest phonetic match in the borrowing language. Since tone categories (as identified by sets of words which all have the same tone) are remarkably stable over time, but tone values are remarkably changeable, it is easy to see that this kind of surface mapping would not yield a neat historical pattern like the one we are attempting to explain.

For example, recent Chinese loanwords in Hmong-Mien languages are borrowed by matching the tone value of the word in the local variety of Chinese with the closest tone value in the borrowing language. “Basically, modern loans use Miao initials, finals, and tones to reflect southwestern Mandarin phonology.” (Ying 1972: 64). In the varieties of local Chinese spoken in the area of three major Hmongic languages — Yǎnghāo (Eastern Hmongic), Làyǐpíng (Northern Hmongic), and Xǔyǒng (Western Hmongic) — there is one rising tone, a reflex of category C1. The tone it will have within each borrowing Hmongic language is determined by phonetics: the rising tone of each Hmongic language is chosen, even though in Yǎnghāo the rising tone is a reflex of category B1, in Làyǐpíng the rising tone is a reflex of category A1, and in Xǔyǒng the rising tone is a reflex of category D2:

(4)

丈	*zhàng*	‘3 1/3 meters’		上	*shàng*	‘to start (class)’	
Yǎnghāo	*tsaŋ*	B1	[35]	Yǎnghāo	*saŋ*	B1	[35]
Làyǐpíng	*ʈaŋ*	A1	[35]	Làyǐpíng	*ʂaŋ*	A1	[35]
Xǔyǒng	*tʂaŋ*	D2	[13]	Xǔyǒng	*ʂaŋ*	D2	[13]

(*Miáo-Yáo Yǔ Fāngyán Cíhūi Jí* 1987)

Theraphan L-Thongkum (1997) presents an interesting case study of language change in progress among younger speakers of Mien, a tone language, in a village near Chiangmai, where Standard Thai, also a tone language, is used as a medium of instruction and both Northern Thai and Standard Thai are widely spoken. In this dialect of Mien, speakers are in the process of reducing their number of tones from six to five, bringing Mien in line with Standard Thai, and are also adjusting the phonetic values of the tones themselves to be more in accord with the phonetic values of Thai tones. However, tone category correspondences do not result as a by-product of this contact-induced change.

(5)

“evolving” Mien	Standard Thai, but	Mien	Thai
33	33	A1	A1a, A2
31	51	A2	B1, C2, D2L
45	45	B1	B2
34	15	B2, C1	A1b
21	21	C2	C1, D1

(L-Thongkum 1997: 158)

Finally, James Chamberlain (1972) has also given a brief account of tone assignment for Lao borrowings in five minority Tai languages of Northeast Thailand. All of these languages, both donor and borrowers, are tonal. The purpose of his paper was to support the contention of Marvin Brown that "tone shapes may be borrowed, but patterns of coalescence and splitting may not" by showing that tone borrowing in these cases is governed by judgments of phonetic similarity. Although I am interested in tone category membership correspondences and Chamberlain was interested in correspondences in patterns of tone category coalescence and splitting, all these things are footprints of earlier historical events, and his findings are consistent with the claim of this paper — that the process of borrowing does not cause borrowers to reproduce the history of the donor language within their own language.

So if both Chinese and Hmong-Mien had been tone languages at the time of the loans, then Middle Chinese loanwords in Hmong-Mien would have the phonetic values of reflexes of various Hmong-Mien tone categories just as they do in modern Chinese loans — reflecting an effort to match the tone in the donor language to the closest tone in the borrowing language — rather than reflexes of only one tonal category across the board, moreover that one which provides a perfect match to the donor language in terms of its place in the system.

2.3. Donor tonal, Borrower atonal

This is the traditional view of the state of things at the time of early contact, especially under the Austro-Tai hypothesis which holds that Hmong-Mien was originally atonal like its Austronesian relatives (Benedict 1975). But in the modern day, we only have evidence for three basic types of outcomes from contact of this sort. First, words may be borrowed without tones because the borrowers cannot hear tone, especially if contact is minimal to non-existent and the number of borrowings is small, as is the case for the handful of Chinese borrowings in English:

(6)

麻將	*májiàng*	>	'mahjong'
烏龍	*wūlóng*	>	'oolong (tea)'
山東	*Shāndōng*	>	'shantung (silk)'

Second, in a situation of greater contact, we may get the odd situation that has been reported by David Filbeck (1972) for one dialect of Mal (called T'in at a higher node in the tree), an atonal Mon-Khmer language of Southeast Asia spoken in the northeast part of Thailand. It has acquired tones in two ways. First, Northern Thai numerals have been borrowed along with their tones. Although this may have arisen as a recitation effect, the numerals are pronounced with their

Northern Thai tones even in running speech. At the same time, other Thai words have been borrowed with a rising pitch profile — presumably because of its salience, because it does not correspond to the pitch contours of the borrowings as pronounced in Thai:

(7)

Thai	Mal	
yâak	*ɲăak*	'difficult'
lâak	*lăak*	'to drag'
khὲɛk	*khĕɛk*	'guest'
klaaŋ	*kăaŋ*	'middle'

(Filbeck 1972: 115)

This rising contour also marks words borrowed from other atonal Mon-Khmer languages, and inexplicably, a couple of native words well.

The third situation, one of intense and prolonged contact, is probably closest to what proponents of the theory that Hmong-Mien acquired tones from Chinese must assume for early Chinese/Hmong-Mien contact, given the number of loanwords and the extent of the grammatical influence Chinese has had upon Hmong-Mien languages over the centuries.

There is one good modern day case where, in the face of widespread multilingualism, the prosodic model of a dominant tonal language (or, in this case, languages) caused an atonal language to develop a complex system of tones. This is the case of the development of tones in the originally atonal Austronesian language Tsat of Hainan Island as described by Graham Thurgood in a series of publications (see Thurgood 1999 for a full account). Tones developed in Tsat under the influence of two tone languages: the local (Mǐn) varieties of Chinese, and the Tai-Kadai language Lí. The tonal system that developed in Tsat is similar in nature to the Thai-influenced Mien described by L-Thongkum: the number of tones and the tone values are almost the same as those of these two neighboring languages which the Tsat speakers know well (Thurgood 1999: 231), a case of surface convergence.

(8)

	Tsat	Chinese (Dānzhōu)	Lí (Tongshi)	Lí (Yuánmén)
high level	55	55	55	55
falling	42	--	43	42
mid level	33	22	33	44
rising	24	35	13	13
low level	11	11	11	11

But the key difference between this situation and the early Sinospheric contact situation that we are trying to understand is that Tsat developed tones in its own way, in a two-by-three system, where the initials started the tonogenetic process and the later split was conditioned by the finals. Thus there can be no corresponding categories in Tsat for Chinese loanwords to map onto — a four-by-two system cannot map directly onto a two-by-three system. Chinese borrowings in Tsat are pronounced with whatever tone is phonetically most similar (Thurgood, p.c. 2002). Although given the assumptions about tone spread in Southeast Asia, this should be the model we are looking for; the kind of cross-linguistic category correspondence pattern characteristic of the Sinosphere is not found here. As Thurgood writes, "it is not being argued that the Tsat tonal *system* is borrowed from one of these languages" (1999: 231).

2.4. Donor and Borrower both atonal

Given our inability to find a present-day (or recent-day) model that could account for the correspondence of tones in the Sinosphere under these three contact situations, we must turn to the last possible scenario. If neither Hmong-Mien *nor* Chinese had tones at the time these early loans in (2) above were made, we can indeed imagine how the striking cross-family correspondence of tone categories in loanwords could have come to be. Hmong-Mien could have borrowed the Chinese words with the (perhaps already decomposing) segmental material which eventually gave rise to tones intact. Then if both developed tones in the exactly same way, out of the laryngeal features of word-final consonants, as a rash of tonogenesis swept across the area (started by who knows who, not necessarily by the Chinese), then we would get these regular correspondences. It is my belief that this is the most likely account of what happened.

The following table contains a summary of the four types of contact described above.

(9)

1. Donor atonal, Borrower tonal	2. Donor and Borrower both tonal
-assignment to a common tone (interpretation of stress/intonation as tone): English > Hmong, Malay > Thai, English > Thai -assignment to a rare tone: English > Cantonese, English > Lahu	-phonetic mapping: (Modern) Chinese > HmM lgs, Lao > Tai dialects -surface convergence: Thai > Mien -assignment to a rare tone: Chinese > Bunu Zhuang > Bunu
3. Donor tonal, Borrower atonal	4. Donor and Borrower both atonal
-words borrowed without tones: Chinese > English -individual words borrowed with tones: N. Thai > T'in (numerals) -assignment to a distinctive pitch profile: N. Thai > T'in (other borrowings) -systems of independent origin, surface convergence: Chinese > Tsat Li > Tsat	-the languages both stay atonal -*the languages both become tonal*

3. Sinospheric languages developed tones together

One striking piece of evidence in support of the hypothesis that Chinese itself was atonal when it lent Hmong-Mien the words in (2) above is that fact that an even older stratum of Chinese loans shows regular tonal correspondences between the two families. Most Sinologists believe that Old Chinese was toneless. How else, then, can we explain correspondences in this oldest stratum of loanwords other than to say that tones developed in the two languages in a parallel fashion after the words were borrowed? And how else can we explain the *identical pattern* in the later stratum of loanwords other than to say that tones developed in the two languages families after these words were borrowed, too?

(10)

			Middle Chinese	Old Chinese	Proto-Hmong-Mien	Tone Category[5]
廩	*lǐn*	'granary'	*lim'*	**(C-)rəm*	**ŋgljɒm*	B2
力	*lì*	'strength'	*lik*	**(C-)rek*	**ŋgljo(k)*	D2
鐵	*tiě*	'iron'	*t^hɛt*	**hliit (~-k)*	**ljok*	D1

Although Chinese contact is probably to be credited with making Hmong-Mien and other languages of the south "tone prone", I don't think it is possible to know who started the tonal ball rolling. The subsequent merger of initials and compensatory tone split is understood as happening in a wave across the whole area, and no one to my knowledge is concerned about identifying which languages started it. Yet for the much earlier prosodic restructuring, many seem to be willing to identify a source. Why not treat them both the same way?

In conclusion, the value of re-thinking the relative timing of the period of contact during which the early Chinese loans were made and tonogenesis is twofold: (1) it can help us do away with the need to explain how languages might borrow things like tone categories and tone systems when we know that speakers have no access to the histories of the languages they're listening to, and (2) insofar that we can time these early loans on the basis of the segmental correspondences, it can help us time the onset of tonogenesis both in Chinese and in the languages that have been so profoundly influenced by Chinese. My hope is that future discussions of tonogenesis in Chinese will no longer rest exclusively on internal evidence, but will also make use of the external loanword evidence in attempting to date the onset of this important typological change.

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[5] Old Chinese reconstructions are from William Baxter (p.c. 2001).

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