Early Sino-Vietnamese Lexical Data and the Relative Chronology of Tonogenesis in Chinese and Vietnamese

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Abstract

Vietnamese has numerous early-era Chinese loanwords with *ngang* and *huyền* tones, which in Middle Chinese loanwords correspond to the *pingsheng* level tone category, for words that should have *sắc* or *nặng* tones, corresponding to the Middle Chinese non-level *qusheng* departing tone category.¹ It is proposed that this layer of Early Sino-Vietnamese represents borrowing of Chinese words in the period after which Old Chinese had lost final *-s and prior to tonogenesis in Viet-Muong, thus leading to words with the level-tone category when tones emerged in Viet-Muong. This paper provides 60 items of Early Sino-Vietnamese that exemplify this phenomenon of *ngang*/*huyền* tones in *qusheng* words, but also 120 items exemplifying the previously noted reversal of *sắc*/*nặng* and *hỏi*/*ngã* tones between Early Sino-Vietnamese and later Sino-Vietnamese (the formalized readings of Chinese characters). Altogether, this allows for an overall relative chronology of the development of tones in both Sinitic and Vietic.

Keywords

Sino-Vietnamese – Chinese loanwords – tonogenesis

1 Introduction

Haudricourt's (1954b) hypothesis of Vietnamese tonogenesis was that Vietnamese tones could be shown to be associated with former final consonants: in native Vietnamese vocabulary, Proto-Austroasiatic final fricatives *-s/*-h correspond to the Vietnamese *hỏi* and *ngã* tones, while final *-ʔ is associated with the *sắc* and *nặng* tones (see Table 3). He also showed that these tone categories could be seen in Chinese loanwords in Vietnamese (Haudricourt 1954a), which similarly demonstrated a connection between

¹ The terminology for tones in Vietnamese and Chinese historical phonology create challenges in both presentation and comprehension of the issues, as noted by reviewers of this paper. In general, I refer to tones in native, non-Chinese Vietnamese vocabulary and early Chinese loanwords before tonogenesis in Vietnamese using Vietnamese tone names (*ngang*, *huyền*, *sắc*, *nặng*, *hỏi*, *ngã*), but those in Chinese and later Sino-Vietnamese words, which fully follow Chinese tone patterns, using the Chinese historical phonological terms (*píng*, *shàng*, *qū*, *rù*, *yìn*, *yáng*). It is not simple to keep both systems in mind according to the situation, and I hope the method I have used will be sufficiently clear to readers.

tones and earlier final consonants in Chinese. In Chinese historical phonological terms, Old Chinese (OC hereafter) final *-ʔ is associated with *shangsheng* tones, and OC final *-s is associated with *qusheng* tones. The two types of tonogenesis became evident in multiple layers of Chinese loanwords in Vietnamese. In support for OC *-ʔ as a source of the *shangsheng* tone category, Mei (1970) noted how earlier and later layers of Chinese loanwords appear to alternate between Vietnamese *hỏi/ngã* and *sắc/nặng* tones, corresponding to Middle Chinese *shangsheng* and *qusheng* categories respectively. Over the decades since those publications, the correspondences between these final consonants and tone categories have been shown to be quite regular, as will be discussed more fully in Section 2.1.

However, in Wang's (1948:63, 76–77 and 1958:380–381) groundbreaking articles on Sino-Vietnamese (SV hereafter) historical linguistics, he noted how some Chinese loanwords in Vietnamese had *ngang* and *huyền* tones (corresponding to Middle Chinese (MC hereafter) *pingsheng* category tones) rather than the expected *sắc* and *nặng* tones (*qusheng* category tones). He offered no phonological explanation but categorized these as nativized forms following Vietnamese pronunciation, what he termed 越化 *yue huà* 'Vietnamized', which suggests that these were loanwords modified later after borrowing from Chinese, a category that has remained in Vietnamese historical linguists' studies.

Alves (2005) presented similar instances among grammatical morphs of Chinese origin, including prepositions, measure words/classifiers, and connective words. As in Wang's data, a subset of these grammatical lexemes consists of colloquial words with *ngang* and *huyền*, while their later literary SV (LSV hereafter) readings had *sắc* and *nặng* tones (comparable to level *pingsheng* and contour *qusheng* tone categories respectively). In this dataset, the spoken grammatical words have the Vietnamese *huyền* tone (marked by falling tone diacritics on main vowels),² corresponding to the lower register *yangping* tone in the Chinese historical phonological tradition, in general, a non-contour-tone category. In contrast, the literary readings, which generally are bound rather than free morphemes, have Vietnamese *nặng* tones (marked by a dot under main vowels), which correspond to the lower register *yangqu* tone, a contour-tone category. Examples are shown in Table 1. Alves also provided no explanation to account for the disparity in tones in Vietnamese, other than to say it is 'nativized' and most likely borrowed via literary transmission (Alves 2005:324–325).

TABLE 1 Sino-Vietnamese Function Words with *Huyền* instead of *Nặng* tones

Gloss	Chinese	Spoken Vietnamese	Standard readings
category	類 <i>lèi</i>	<i>loài</i>	<i>loại</i>
for; because	為 <i>wèi</i>	<i>vì</i>	<i>vị</i>
self; from	自 <i>zì</i>	<i>từ</i>	<i>tự</i>
outside	外 <i>wài</i>	<i>ngoài</i>	<i>ngoại</i>
allotted duty; part	分 <i>fēn</i>	<i>phần</i>	<i>phận</i>
measure, to	量 <i>liàng</i>	<i>lượng</i>	<i>lượng</i>

2 Throughout this paper, Vietnamese orthography, *Quốc Ngữ*, will be used rather than IPA transcription, somewhat like the use of pinyin for Mandarin Chinese. This orthography is convenient, it allows readers to consult dictionaries, and using the orthography precludes the choice of transcribing one regional accent versus another.

Moreover, the Romanized alphabet is reasonably accessible to readers of English, and the tone diacritics in the system are iconic. Tone categories are also presented in Section 2.1. As a national language, Vietnamese has numerous resources readily available to provide additional detail of Vietnamese phonology.

However, the substantial number and variety of function words that were borrowed from Chinese into Vietnamese demonstrate a more intense contact scale of linguistic borrowing, not borrowing merely from sociolinguistically influential Vietnamese literati (in a similar vein as Thomason and Kaufman's typology of language contact (1988:75–76)). Phan (2013:347–352) argues that such grammatical Chinese vocabulary in Vietnamese represents an adstratum, the remnants of a now non-existent Chinese-speaking community in that region. Moreover, these items appear not to be from the later period of LSV words, but rather belong to the layer of first millennium loanwords. If they were from the later period, the *pingsheng* tones on words with sonorant initials would be of the upper *yin* register and have *ngang* tones instead of *huyền* tones of the lower *yang* register (e.g. non-existent **loai* instead of Vietnamese *loài* 'category') (cf. Wang 1948:54, Phan 2013:95–97, 273–274). The age of these items will be discussed in Section 5.

I have assembled an unpublished database of several hundred potential Chinese loanwords rated medium to high certainty from the Late Old Chinese (LOC) to Early Middle Chinese (EMC) period, the layer called Early Sino-Vietnamese (ESV) (see Section 2). In that data, several dozen of these doublets of *pingsheng* and *qusheng* loanwords were identified. That is, the ESV words had the level tones *ngang* and *huyền*, but the LSV tone categories of these words have contour *sắc* or *nặng* tones. This additional lexical data further strengthens the claim that this pattern constitutes a systematic phonological change. Over time, while gathering more lexical items in this category of Chinese loanwords in Vietnamese, I have considered several hypotheses to explain the pattern, as shown in Table 2.

The first hypothesis is untenable as the data is sufficient in quantity and consistency that these cannot be considered haphazard aberrations in small numbers of sporadically borrowed words. As for the second hypothesis, Wang (1948) raised the issue of 'nativized' vocabulary, that is, Chinese lexemes modified to fit Vietnamese phonology after being borrowed and generally later than the MC era. However, this cannot be considered viable in light of current understanding of tonogenesis: there are no patterns of changes from level to non-level tones in Vietnamese historical phonology, nor was there a phonological environment in Vietnamese that could have caused the tone categories to shift from non-level to level. In the third hypothesis, Wang (2006) hypothesized that some Chinese words with *qusheng* tone words did not have final fricatives, the feature that has been claimed to correspond with this tone category. However, as shown in subsequent sections, what Wang presented as data for irregularity in Vietnamese in fact corresponds systematically to multiple strata of Chinese loanwords from different periods (see Table 17 showing examples of triplets).³ In the fourth hypothesis, Jia (unpublished notes) has noted a couple dozen instances in Pinghua and Tuhua Chinese of words with *pingsheng* category tones for what should

TABLE 2 Hypotheses for the alternation between ESV *ngang/huyền* tones and LSV *sắc/nặng* tones

1. Random alternations due to loanword intake process
2. Nativized vocabulary in the post-SV period (cf. Wang 1948)
3. Loanwords belonging to one of two types of *qusheng* words lacking final fricatives in OC (Wang 2006)
4. Instances of *pingsheng* tones for *qusheng* words in regions of Southern Chinese, such as Pinghua (p.c. Jia Fangzhi)
5. Evidence of a period of loss of final *-s between LOC and EMC (Pulleyblank 1962 and Zhu 2009)

3 I only make claims with respect to Sino-Vietnamese data. As for the data for other languages in Wang's paper and Wang's overall hypothesis of different types of *qusheng* words in Chinese, that is beyond the scope of this paper.

have *qusheng* tones. Some of these words are the same as those in ESV data, but a majority are not, so this is not lexical sharing between those groups and the Chinese spoken in northern Vietnam. Whether this can be shown to be a regional tendency and relevant to ESV vocabulary remains to be seen, but regardless, that data is limited and does not affect the main claims of this paper.

Rather than the above hypotheses, considering historical phonological circumstances in both Chinese and Vietnamese, the explanation with the most supporting evidence is as follows: these ESV items with *ngang/huyền* tones for what are LSV *qusheng* tone words were borrowed at an intermediary stage in which Sinitic⁴ had lost final fricatives *-s and *-h and before Vietic had undergone tonogenesis, resulting in level tones in these words. A stage in the development from the end of OC to MC in which final fricatives, which correspond to later *qusheng* tones around 3rd century CE was originally proposed by Pulleyblank in 1962⁵ and revisited later by Zhu (2009 and 2015). The ESV data presented in this paper can support this claim of the process and relative timing of tonogenesis in both Sinitic and Vietic. It thus provides not only support for the historical phonological hypothesis but also of the history of Sinitic-Vietic language contact in the first millennium CE at the time of tonogenesis (before, during, and after) in both speech communities.

The current study presents over 190 early Chinese loanwords in Vietnamese with tonal patterns contrasting with those LSV words borrowed during the Late Middle Chinese (LMC) period. The data supports theories of Haudricourt (1954b) of Vietnamese tonogenesis, Pulleyblank (1962) of final *-s in OC in *qusheng* words, and Mei (1970) of final *-ʔ and *shangsheng* words, as shown through patterns of alternations between *qusheng* and *shangsheng* tones in ESV and LSV. The data also includes over 60 ESV words with the above-mentioned unexpected *ngang* and *huyền* tones in words which later have *sắc/nặng* tones in the MC era LSV (noted in Alves (2016) as a feature of some ESV words). These ESV items (a) clarify the relative timing of the borrowing of doublets in relation to the order of phonological changes in OC, (b) verify that Vietic developed tones later than Sinitic did (and thus somewhat later than Haudricourt originally proposed), and (c) support the presence of a large, long-term Chinese-speaking community in northern Vietnam (i.e. Phan's (2013) Annamese Chinese) through the first millennium CE prior to independence of northern Vietnam from a Chinese administration.

The rest of this paper presents the following: (1) an updated view of tonogenesis in the history of Sinitic and Vietic considering Sino-Vietnamese lexical data, (2) the periods of Sinitic loanwords in Vietic and relevant phonological characteristics of the different strata, (3) explanation of the two types of tonal phenomena noted, and (4) implications of the data and concluding thoughts. In the Appendix, all 190-plus items are presented in tables according to phonological patterns, as explained in Section 3.

2 An Updated View of the Periods of Tonogenesis in Sinitic and Vietic

A crucial point to make about Sinitic-Vietic contact is that both language groups have been reconstructed with the finals *-ʔ, *-s, and *-h, all segments relevant to tonogenesis in both. This situation appears to

4 The term 'Sinitic' is used here to refer to the larger speech community that connected both OC and EMC prior to major sub-branching of Chinese dialect groups later. It is also parallel with the term Vietic, which similarly refers to the ancestral speech community of modern Vietnamese prior to the major differentiation of Viet-Muong and other groups of Vietic.

5 I must thank Guillaume Jacques for sharing Pulleyblank's article with me. It was crucial in my ability to make this connection between the ESV data and phonological changes from OC to MC.

have had the effect of allowing Vietic speakers to borrow said segments in OC-era and EMC-era words with substantial consistency. These aspects are described further in Sections 2.1 and 2.2.

2.1 *Tonogenesis in Vietic*

As noted, Vietnamese tones are known to correspond to the loss of final consonants, namely, the final fricatives *-h and *-s and final glottal stop *-ʔ seen in Austroasiatic etyma.⁶ While a comparison of reconstructed Proto-Austroasiatic forms and the related Vietnamese words shows there is not complete consistency, the weight of evidence is sufficient to maintain Haudricourt's hypothesis from several decades ago. The full range of Vietnamese tones and comparative samples in Proto-Vietic and Proto-Austroasiatic are shown in Table 3. In it, the categories of final sonorants, fricatives, and voiceless stops constitute one parameter, while initial consonant voicing is another parameter which divides the categories by tone height.

Notably, in Shorto's (2006) 2,000 Proto-Austroasiatic reconstructions,⁷ while there are many instances of the *nặng* tone on words with final -p/-t/-k, there are noticeably fewer instances of *nặng* tone corresponding to a Proto-Austroasiatic etymon with final glottal stop. Conversely, there are numerous instances of Vietnamese *nặng* tone words which are Chinese loanwords originally with final glottal stop, dozens of which are shown in Tables D, E, F, and G in the Appendix. Thus, SV lexical data provides evidence for Haudricourt's hypothesis of tonogenesis in Vietnamese as well as in Chinese, as discussed in subsequent sections.

Another impact of this hypothesis is an account of tones differing between doublets from earlier and later layers of Chinese loanwords. In the Chinese historical phonological tradition, OC final glottal stop and final *-s are reconstructed for words which have the *shangsheng* and *qusheng* categories respectively. In SV doublets borrowed in the two periods of Late MC (LMC hereafter) versus LOC and EMC, there has been a seeming reversal (cf. Mei 1970, Pulleyblank 1978, Sagart 1986, etc.). Chinese words borrowed with final *-ʔ (the *shangsheng* category) in the earlier period eventually developed *sắc* and *nặng* tones in

TABLE 3 Vietnamese Tones and Austroasiatic Comparanda

Tone	Ngang	Huyền	Hỏi	Ngã	Sắc	Nặng	Sắc	Nặng
<i>Gloss</i>	bird	turn back	to split	nose	dog	husked rice	hair	gall
<i>Vietnamese</i>	chim	về	chẻ	mũi	chó	gạo	tóc	mật
<i>Proto-Vietic</i>	*-ci:m	*ve:r	*cəh	*mu:s	*ʔa-cɔ:ʔ	r-ko:ʔ	*-suk	məc
<i>Proto-AA</i>	*cim	*wir	*cih; *ciəh	*muuh; *muus	cɔʔ	*rk[aw]ʔ	*suk; *suək	*k.mət
Finals	Sonorants		Fricatives		ʔ		Stops	

6 The descriptions of tonogenesis in this article are largely based on phonemes and syllable shapes. The actual process likely involved the secondary phonation effects related to the consonants rather than the consonants themselves directly causing tone. For a more precise phonetic account of the process of Vietnamese tonogenesis, see Thurgood (2002). See also Sagart (1986) and Zhu (2009) for a more detailed account of phonetic aspects of Chinese tonogenesis.

7 Shorto used the term 'Proto-Mon-Khmer'.

Vietnamese, but the same etyma borrowed after the loss of finals and after tonogenesis in both Sinitic and Vietic later developed the *hỏi* and *ngã* tones (the Chinese *qusheng* category): the reverse occurred among *qusheng* category words in Chinese stemming from words with earlier final **-s*. Another way of describing the situation is as follows: the expected Vietnamese tones in MC words with *shangsheng* tone categories are *hỏi* and *ngã* tones, while those with *qusheng* categories have *sắc* and *nặng* tones. This is the case for many thousands of standard Sino-Vietnamese readings of Chinese characters that belong to the LSV layer. In the ESV layer, conversely, *shangsheng* words have *sắc* and *nặng* tones, and *qusheng* words have either *hỏi* and *ngã* tones or *ngang* and *huyền* tones. This is shown in the highlighted cells in Table 4.

The phonetic situation was undoubtedly more complex.⁸ Vietnamese tones, as do many languages in Mainland Southeast Asia, have a variety of phonation features, such as glottalization, breathiness, and the like, which played a part in both tonogenesis and registrogenesis (cf. Alves (1995), Brunelle and Kirby (2016)). As for Chinese, Sagart (1986, 1988) posited that Middle Chinese tones had secondary features, including distinctions in length, glottalization, and creakiness, before the height split which doubled the original four tone categories to eight (cf. Phan (2013:89–91) for further refinement of Sagart's model). While it is difficult to say exactly what impact this had on the borrowing of Sinitic words into Vietic during this period, there is no substantial evidence of impact. That is, EMC words with these hypothesized

TABLE 4 Tone categories of OC, ESV, and LSV (Alves 2016:269)

Comparative Categories	A (level)		B (rising)		C (departing)		D (entering)	
<i>Chinese rhyme table categories</i>	平 píng		上 shǎng		去 qù		入 rù	
OC	final vowels or sonorants		final <i>*-?</i>		final <i>*-s</i>		final <i>*-p, *-t, *-k</i>	
Proto-Vietic	final vowels or sonorants		final <i>*-?</i>		final <i>*-s</i> or <i>*-h</i>		final <i>*-p, *-t, *-k</i>	
<i>Height/register</i>	Yin	Yang	Yin	Yang	Yin	Yang	Yin	Yang
ESV	ngang	huyền	sắc	nặng	hỏi	ngã	sắc	nặng
					ngang	huyền		
LSV	ngang	huyền	hỏi	ngã	sắc	nặng	sắc	nặng

8 Polysyllabicity appears not to have had a significant impact on the issues of tone in Chinese loanwords in Vietnamese (though polysyllabicity in Vietic languages has impacted reconstructions of OC, as in Baxter and Sagart (2014)). Based on comparative data with southern Vietic languages, Ferlus (2004) has reconstructed disyllables in Vietic (using the term 'Viet-Muong', which is here considered a branch of Vietic). Masaaki (2015) has provided textual evidence of presyllables in Vietnamese. Data on Southern Vietic languages shows them to be sesquisyllabic, in which words first have one unstressed, phonologically reduced syllable followed by a stressed syllable. In these sesquisyllabic Vietic languages, tone occurs only on the stressed syllable. Whether Archaic Vietnamese at the stage when presyllables remnants still existed also exhibited this phenomenon of tone solely on stressed syllables is unclear. Regardless, presyllabic material in late Vietic and Ancient Vietnamese apparently had no major impact on ESV and LSV tones, though there are a few cases of unexpected tone height that could be the result of such phonological material. Details for this phenomenon are not yet available, and a fuller study of the matter of polysyllabicity in both Sinitic and Vietic at various points of language contact would be required to clarify the matter: this is clearly beyond the scope of this paper and, again, appears to have had no significant impact on the claims in this paper.

TABLE 5 Eras of Chinese *Qusheng* Tones in Vietnamese

Eras	OC and MC Source	Corresponding Tones in ESV and LSV Layers
<i>Earliest</i>	OC *-s/*-h	ESV → <i>hỏi/ngã</i> tones
<i>Middle</i>	Loss of OC *-s/*-h leading to MC <i>qusheng</i> tones	ESV → <i>ngang/huyền</i> tones
<i>Latest</i>	MC <i>qusheng</i> tones	LSV → <i>sắc/nặng</i> tones

secondary features appear to have the expected tones specifically according to the segmental phonemes. It is not impossible that, for example, the glottalization of pre-register split MC tones could have resulted in the *sắc/nặng* tones in Vietnamese, but this is difficult to demonstrate at this time. Sagart (1986:85) similarly shows how, in many modern varieties of Chinese, glottalization and breathiness are features associated with tones. The large number of ESV items which have level *ngang* and *huyền* tones suggest that any hypothetical remaining breathiness in the EMC tones did not have any impact on how they were borrowed. Regardless of the phonetic details, the overall correspondences shown in Table 4 are robustly supported.

Returning to the question of the final laryngeal phonemes, again, many *qusheng* tone words in ESV vocabulary have the level *ngang* and *huyền* tones, as noted in Table 4. A primary goal of this paper is to show that ESV words with *ngang* and *huyền* tones (comparable to *pingsheng* tones) for *qusheng* tone category words, represent the loss of final fricatives in OC transitioning to MC. Also, it is hypothesized that ESV words with *shangsheng* for *qusheng* words (*Hỏi/Ngã-for-Qu*) are older than their *pingsheng* counterparts as they were borrowed when final OC fricatives still existed. These eras of SV vocabulary and development of tones in the *qusheng* category are summarized in Table 5.

Further evidence for the process of tonogenesis in later stages of Vietic comes from the southern Vietic languages (i.e. Vietic languages other than those in the Viet-Muong⁹ sub-branch). While Viet-Muong

9 For this paper, the following general periods of the ancestral history of Vietnamese are assumed. The focus in this study is the later period of Vietic and the distinction of northern and southern Vietic leading to Viet-Muong.

Austroasiatic: This was prior to or in the early stages of differentiation of Austroasiatic language groups. It was nontonal and polysyllabic. It has been hypothesized that Austroasiatic dispersal through Mainland Southeast Asia occurred around 4,000 years ago (Sidwell and Blench 2011, Higham 2017).

Vietic: This stage began after differentiation from other Austroasiatic language groups (no data is available to provide an approximate period). The group was presumably fully distinct by the time of contact with Sinitic as some Chinese loanwords are reconstructable in Proto-Vietic. There was gradual north-south differentiation during heavier language contact with Sinitic in the northern part. Vietic was polysyllabic, with likely iambic stress and sesquisyllabicity (cf. Ferlus 2004), and it may have had phonation, but tones are not reconstructable as not all Vietic languages have tones.

Viet-Muong: This northern Vietic language group developed after several centuries of significant language contact with Sinitic (no specific time can be offered here), differentiating it from southern Vietic. It may have had presyllables (though how much reduction from the early stages is uncertain), and it had a fully developed tone system.

Vietnamese: After distinction from Muong languages early in the 2nd millennium CE and seen in Chinese-based Nôm texts representing the Vietnamese language, Vietnamese passed through ancient to modern stages (such stages have not yet been precisely identified), with gradual emergence of northern, central, and southern regional varieties. Early textual data shows lingering remnants of presyllables in the first few centuries of the 2nd millennium CE (Masaaki 2015), but only initial clusters remained until the 19th century (Vu 2019).

languages have full tone systems (i.e. at least three main categories), the other Vietic languages have a mix of situations ranging from two main tone categories to only systems of phonation/registeral features. The Chứt languages (e.g. Rục (Nguyễn V. L. 1993) and Mày (Babaev and Samarina 2018)) have four-tone systems: two main categories split by register/height. Perceiving them through the MC tone system, they have tones corresponding to Vietnamese *ngang* and *huyền* tones (i.e. level tones) and to *sắc* and *nặng* tones (i.e. contour tones), but not tones corresponding to *hỏi* and *ngã* tones in Vietnamese. This is due to retention of final /h/ in those languages, which essentially reduces by one the number of tone categories. In contrast, some Vietic languages to the southwest of northern Vietnam do not have contour tones but rather register systems and retention of final /h/ and sometimes /s/, such as Thavung with a four-way register system involving breathiness and creakiness (Premrirat 1996). The Kri language similarly lacks a tone system but rather has a system involving what Enfield and Diffloth (2009) describe as register ('heavy' versus 'light' syllables) plus 'terminance' (voiced, voiceless, and checked). Ferlus (1998) reviews many of the types of tone and/or register systems of the language group.

These are all suggestive of the characteristics of Vietic phonology in the period of contact with Sinitic and stages of evolution of tones in Viet-Muong. The lack of tones in some but presence of at least phonation in most (if not all, though this is an unanswered question) suggests proto-Vietic lacked tone but had phonation features (cf. Diffloth 1989). It also demonstrates a hypothetical situation in which Vietnamese, and other Vietic languages, could have followed a path of tonogenesis independently of Sinitic with the retention of final *-h, leading to these smaller sets of tones. Overall, while language contact with Sinitic appears to have affected the ultimate development of the tone system of Vietnamese, it was not a case of borrowing Chinese tones. This idea will be revisited in Sections 2.2 and 2.6.

2.2 Sinitic-Vietic Contact History

Historical records suggest that initial contact between Sinitic-speaking peoples and those of modern-day northern Vietnam occurred at least during the western Han Dynasty from 111 BCE, the beginning of Han administrative control, if not earlier. However, more intense sociocultural contact, for the time when there is both historical textual evidence and archaeological evidence of a substantive Chinese population in modern-day northern Vietnam, begins in the eastern Han in the first century CE (e.g. Taylor 2013:50–52, Alves 2016). Thus, the first few centuries CE were the probable beginning of substantive lexical borrowing. It is now reasonably widely accepted that, at the time of initial Sinitic-Vietic language contact around 2,000 years ago, neither Sinitic nor Vietic were tonal. The four primary tone categories in Chinese (*ping*, *shang*, *qu*, and *ru*) were used in the Chinese rhyming dictionary, the *Qieyun*, in 601 CE, and these tone categories were even mentioned in texts a century earlier (Baxter 1992:304), giving an approximate timing of their emergence. These four categories have been maintained with substantial regularity in all contact language groups in the Sinosphere, including Vietic, Tai¹⁰ and Hmong-Mien,¹¹ as shown in Table 6. OC reconstructions and MC transcriptions are those of Baxter and Sagart (2014).

In an overview of five possible scenarios of the sequence of tonogenesis among Sinitic, Vietic, Kradai, and Hmong-Mien, Ratliff (2010:184–192) has hypothesized that rather than Sinitic being a fully tonal language bringing tones to the south, tonogenesis in those languages most likely occurred in a similar period after the movement of Sinitic southward. Support for this claim is that early Chinese loanwords in the

10 Key works on the history of tones of Proto-Tai include those of Li 1977 and Pittayaporn 2009, and for Proto-Hlai, see Norquest 2010. To this author's knowledge, there is no reconstruction of tones for proto-Kradai.

11 For the history of tones of Proto-Hmong-Mien, see Ratliff 2010.

TABLE 6 Patterns of Tonal Correspondences in the Sinosphere

Tones	A	B	C	D
Character	正 zhēng '1st month'	染 rǎn 'to dye'	箸 zhù 'chopsticks'	狹 xiá 'narrow'
Old Chinese (Baxter & Sagart 2014)	*C.teŋ	*C.n[a]m?	*[d]<r>ak-s	*N-kʰrep
Hmong-Mien (Ratliff 2010)	*sjeŋ 'first day of month'	*jum ^C (Mienic only)	*drou ^H	*hep ^D (Mienic only)
Tai (Pittayaporn 2009)	*ciəŋ	*jwu:m ^C	*thu ^B (Li 1977)	*gap ^D
Vietnamese	giêng (SV chính)	nhuộm (SV nhuộm)	đũa (SV trợ)	hẹp (SV hẹp)

TABLE 7 Chronology of Sinitic and Vietic Language Contact and Stages of Tonogenesis

Era	Contact Situation	Sinitic	Vietic
0 CE (Han Dynasty)	Early Sinitic-Vietic contact	LOC: nontonal	Vietic: nontonal
601 CE (Sui Dynasty)	Developed Sinitic-Vietic contact	EMC: tonal	Vietic: no n tonal
1000 CE (Vietnamese independence)	Chinese in northern Vietnam in process of shifting to Viet- Muong	LMC: tonal	Viet-Muong: tonal

other language groups in the region which retained the Chinese tone categories, including non-level contour tones, must have been borrowed with original segmental features (but also likely phonation features related to those segments), not tones. Non-tonal languages do not have the phonological system by which tones can be borrowed, and thus the phonological consistency means that such borrowing happened prior to tonogenesis and when Sinitic still had final glottal stop and final fricatives.

Table 7 summarizes these implications. At the beginning of the Common Era, neither Sinitic nor Vietic had tones. Before tonogenesis in OC, Vietic speakers were able to perceive final glottal stop and fricatives; otherwise, the tonal correspondences would not have been as regular. By the 600s, Sinitic/Chinese had four tone categories, while Vietic was still nontonal, and thus unable to borrow tones of words. This detail pushes Haudricourt's (1954b:81) speculation of the 6th century tonogenesis in the ancestral language of Vietnamese at least a couple of centuries later.

2.3 From *ESV* to *LSV* Vocabulary

An important source of comparative data to study Chinese tonogenesis is Chinese loanwords in Vietnamese, which include doublets (and even triplets as shown in Table 17 of Section 6.2). One probable hypothesis is that the path of tonogenesis in Vietic was influenced by language contact with Sinitic after Sinitic developed tones, and *ESV* data shows that Vietic speakers borrowed Sinitic words with their final laryngeals and fricatives. However, as has been noted (Pulleyblank 1962, Zhu 2009), the timing of the loss of final fricatives likely took place prior to the loss of Sinitic's final glottal stop. Pulleyblank (1962:217–220) used textual data regarding transcriptions of foreign words in Buddhist transcriptions to demonstrate that final fricatives existed in Chinese through the 3rd and into the 4th century CE. Zhu (2007, 2015) has

TABLE 8 Stages of ESV to LSV with respect to segments, tones, production, and perception

<i>Stage one</i>	Vietic speakers borrowed OC words with *-s/*-h and *-ʔ; there were no tones to perceive in OC.
<i>Stage two</i>	Vietic speakers borrowed EMC words with *-ʔ; tones could not be perceived as phonological elements.
<i>Stage three</i>	Viet-Muong speakers borrowed MC words with tones; Viet-Muong had tones and could perceive and adopt tones.

hypothesized that the final glottal stop (though Zhu suggests the final glottal was a possibly secondary feature) lasted until the 7th century.

What the comparative data in this study suggests is three stages of loanword strata in Vietnamese reflecting three periods of the development of the Sinitic tone system, summarized in Table 8. The factors involve available segments and tones in terms of both production by Sinitic speakers and perception by Vietic speakers. In the third stage, all final laryngeals had been lost, Vietic had become tonal, and the combined Sinitically-influenced Vietic and the MC speech community created circumstances to allow consistent borrowing of MC tones. This accounts for the changing patterns of tones between ESV and LSV listed in Table 4.

3 Eras and Phonological Traits of Sinitic Loanwords in Vietic

Before exploring the issues of source words and tones of ESV vocabulary, characteristics of ESV vocabulary and phonemes are summarized in this section. The earliest major study of the historical phonology of SV vocabulary is that of Maspero (1912), but early significant studies of different strata of Chinese words in Vietnamese are those of Wang (1948 and 1958) and Haudricourt (1954a). Vietnamese scholars have also explored other layers of SV (Đào 1979, Nguyễn T. C. 1995, Vương 2002, Nguyễn N. S. 2003, Nguyễn T. T. 2015). Other researchers have also explored early layers of SV (Mei 1970, Tryon 1979, Pulleyblank 1981 and 1984, Schneider 1992, Baxter and Sagart 2014, Phan 2013, Alves 2016, Jia (unpublished notes), etc.). The ESV lexical data provided in this study come from these sources and other ESV words I have identified.

The term 'Sino-Vietnamese' may refer to formally recognized (e.g. listed in dictionaries) Vietnamese pronunciations of Chinese characters, what have been referred to in this study as LSV, the later, literary layer of SV. More broadly, SV vocabulary is associated with MC, which could stem from the second half of the 1st millennium and before Vietnamese independence from China, while LSV is associated with LMC of the early second millennium, after administrative independence. These character readings include the entirety of the Chinese character inventory. Some of these LSV words have become part of spoken Vietnamese, while some have remained part of the literary tradition with little or no usage in spoken Vietnamese. This is similarly the case in Sino-Korean and Sino-Japanese. However, unlike the non-tonal Sino-Korean and Sino-Japanese readings, LSV has retained the tone categories listed in Chinese dictionaries, such as the *Guangyun*, and therefore represent a practice involving literacy but also a period of extensive Sinitic-Vietic bilingualism to allow for the consistent borrowing of tones in spoken Vietnamese. Phan (2013) has hypothesized what he calls Annamese Chinese, essentially a variety of MC in northern Vietnam in the first century millennium that was eventually lost, most likely due to language drift and merging with Viet-Muong. Such a situation accordingly left a substantial amount of lexical borrowing, which is still being uncovered as methods of identifying them (both linguistic and extralinguistic data and the use of lexical databases) have grown.

However, prior to that period of adoption of Chinese phonology through both literary and spoken transmission, many Chinese words were borrowed solely through speech, not through a literary tradition. This requires only that two languages be spoken in a community, without text as a necessary source for borrowing, though there were signs of literacy among the population in the region, such as locals participating in the civil service exams (e.g. Taylor 1983:219–220). Correspondingly, ESV words are well integrated in spoken Vietnamese, and there is a much smaller number of these words than the total number of Chinese characters. The identification of ESV items has been challenging as they are different from their LSV counterparts phonetically and sometimes semantically as well, whether due to changes in Sinitic, Vietic, or both. ESV borrowings extend from the periods of LOC to EMC, and likely into MC proper before tonogenesis in the Viet-Muong sub-branch of Vietic. The various characteristics of LSV and ESV vocabulary are summarized in Table 9.

The result is that there are hundreds of Chinese doublets involving the ESV and LSV layers (though as will be shown, some words were borrowed twice in the ESV period, resulting in triplets). The phonological differences can be seen in initials, vowels, and finals. In Table 10, ESV items retain OC *r, as in ‘dragon’ and ‘bamboo curtain’, while LSV items match the change to MC *l. According to available data, OC items with presyllables and either bilabial initials (e.g. ‘square’ and ‘wall’) and medial *-w- (e.g. ‘to draw/paint’) have lenited to initial /v/ in ESV items (with similar patterns in Vietnamese words in general, as described by Ferlus (1982)), while again, the LSV and MC initials match. As for vowels, one common phenomenon is diphthongization, as in ‘square’, ‘stele’, and ‘must’. OC *e is often retained in ESV items without the

TABLE 9 Features of LSV and ESV Vocabulary

Aspects	ESV	LSV
<i>Era</i>	– From LOC to EMC and MC proper	– Largely from LMC
<i>Relation to tones</i>	– Borrowed prior to tonogenesis in Vietic	– Borrowed after tonogenesis in Viet-Muong
	– Patterns of tone categories differing in various ways from those of MC and LSV proper	– Retained all MC tone categories with high consistency
<i>Usage</i>	– Either not recognized as Chinese in origin or not considered standard readings of Chinese characters	– Vietnamese phonology for readings of all Chinese characters
	– Highly integrated (i.e. typically part of vernacular Vietnamese, perceived as native/non-Chinese, etc.)	– Part of the East Asian and Sino- Xenic literary tradition
<i>Means of transmission</i>	– Borrowings primarily via spoken Sinitic-Vietic bilingualism	– Indication of both Sinitic-Vietic widespread bilingualism and a literate Sino-Viet elite
		– Associated with the loss of Annamese-Chinese due to language shift with Viet-Muong and cultural merging with Viet-Muong groups
<i>Quantity</i>	– Not as large numerically as Chinese characters, currently several hundred items of medium to high certainty	– Constituting all Chinese characters, with thousands in spoken Vietnamese

TABLE 10 Samples of Doublets in ESV and LSV

GLOSS	CHIN	OC	MC	ESV	LSV
dragon	龍 lóng	*[mǎ]-ron	ljowng	ròng	long
bamboo curtain	簾 lián	*rem	ljem	rèm	liêm
square	方 fāng	*C-paŋ	pjang	vuông	phương
wall	壁 bì	*C.p ^h ek	pek	vách	bích
draw/paint, to	劃 huà	*C-g ^w rek-s	hweaH	vẽ	họa
new year	節 jiē	*ts ^h ik	tset	tết	tiết
side	邊 biān	*p ^h e[n]	pen	bên	biên
father's elder brother	伯 bó	*p ^h rak	paek	bác	bách; bá
white/silver	白 bái	*b ^h rak	baek	bạc	bạch
level (adj.)	平 píng	*m-breŋ	bjaeng	bằng	binh
stele	碑 bēi	*pre	pje	bia	bi
must	須 xū	*[s]o	sju	tua	tu

TABLE 11 General Patterns of Segmental Correspondences between ESV and LOC/EMC

Consonants

- Retention of single-consonant initials and finals (nasals, stops, liquids)
- Loss of LOC/EMC medials (e.g. *-r-, *-j-, etc.) in initial clusters
- Development of initial fricatives (e.g. /v/, /ɣ/, etc.) from presyllabic material in LOC

Vowels

- Retention of OC/MC vowels (e.g. *e, *a, *o, etc.)
- Diphthongization of single vowels in LOC (?) loans (e.g. /iə/, /uə/, /iə/)

palatal medial, as in ‘bamboo curtain’ and ‘side’. In ESV, final velars of OC are retained instead of the palatalized finals of LSV, as in ‘white/silver’ and ‘level (adj.)’. Many other instances of such patterns are seen in available data.

Table 11 provides an overview of the kinds of phonological characteristics of ESV vocabulary. These patterns, among others, underlie the ESV items throughout this paper in assessing the degree of certainty of posited ESV vocabulary. Publications noted above should be considered for more clarification. More work is needed in this aspect, and this paper cannot account for all the segmental patterns.

In addition to ESV words with segmental differences from their LSV counterparts, some ESV items differ from LSV only in tone, for example, ESV *cám* ‘thanks’ versus LSV *cảm* (from Chinese 感 *gǎn* ‘thanks’) and ESV *dùng* ‘to use’ versus LSV *dụng* (from Chinese 用 *yòng* ‘to use’). Dozens of such words are presented in this paper, data which can be explained by assuming previous segmental features in LOC and EMC, and their loss can also be evidenced in ESV data, primarily via tones. While this section has dealt with segmental features of ESV, subsequent sections focus on suprasegmental features.

4 *Hỏi/Ngã* Tones in *Qusheng* Words and *Sắc/Nặng* Tones in *Shangsheng* Words

The observation of the alternation between ESV and LSV words in the Chinese *shangsheng*/rising and *qusheng*/departing tone categories was important half a century ago in understanding the segmental/consonantal features of the words that developed those tone categories in MC (Mei 1970). Sagart (1988) further clarified the pattern, putting in a larger context the region of Sinitic, Vietic, Tai, and Hmong-Mien. Further support for the posited loanwords showing the *hỏi/ngã* and *sắc/nặng* reversal (in a sense, a reversal of the *shangsheng* and *qusheng* categories) between ESV and LSV items in the early first millennium CE has been given from extralinguistic sources, such as textual and archaeological data (Alves 2016). Moreover, in the vast majority of cases identified for this paper, the tone height is consistent: ESV items with upper register tones most often¹² also have upper register tones in their LSV counterparts, and the same is the case for words with lower register tones. Thus, combined with consistency of segmental and semantic features and, in many cases, culturally specific items, actions, and concepts, the certainty of proposed ESV items as earlier loanwords than LSV vocabulary is medium to high in the data presented in this study.

As described in Section 3, many ESV items having tones contrasting with the later LSV layer have other segmental differences that further identify them as early borrowings. For ESV words with *sắc/nặng* tones, while their LSV counterparts have *hỏi/ngã* tones, that is, when OC still retained final glottal stops, a substantial majority of the items have segmental differences from their LSV MC-era counterparts (78 differing, but only 15 the same). The ESV words with *hỏi/ngã* tones versus LSV *sắc/nặng* tone words primarily consist of groups of words with segmental differences from the later MC-era loans, but with a slightly higher relative quantity of those with the same segments (31 differing, but 4 the same). These numbers are summarized in Table 12, which also lists the tables in the Appendix with the relevant categories of ESV items. Table 13 contains samples from the full tables in the Appendix. Additional labels of A, B, C, and D for the four tone categories and 1 and 2 for high and low register (e.g. B1 for C1) are shown to further clarify the tone categories.

TABLE 12 ESV *Hỏi/Ngã* Words versus LSV *Sắc/Nặng* Words (B versus C) and ESV *Sắc/Nặng* words versus LSV *Hỏi/Ngã* Words (C versus B)

ESV to LSV Tone Correspondences	Similarity to segments in LSV	Quantity	Tables in Appendix
<i>Hỏi</i> versus <i>Sắc</i> tone words (B1 vs. C1)	differing	16 items	A
<i>Ngã</i> versus <i>Nặng</i> tone words (B2 vs. C2)	differing	15 items	B
<i>Ngã</i> versus <i>Nặng</i> tone words (B2 vs. C2)	the same	4 items	C
<i>Sắc</i> versus <i>Hỏi</i> tone words (C1 vs. B1)	differing	46 items	D
<i>Sắc</i> versus <i>Hỏi</i> tone words (C1 vs. B1)	the same	13 items	E
<i>Nặng</i> versus <i>Ngã</i> tone words (C2 vs. B2)	differing	32 items	F
<i>Nặng</i> versus <i>Ngã</i> tone words (C2 vs. B2)	the same	2 items	G
	TOTAL	128 items	

¹² There are a small number of exceptions, alternations in register, which are not explainable at this time. These instances may represent the effect of presyllabic material, whether from OC or even possibly the addition of affixes in Vietic.

TABLE 13 Samples of ESV versus LSV items – *Sắc/Nặng* versus *Hỏi/Ngã* and *Hỏi/Ngã* versus *Sắc/Nặng*

GLOSS	CHIN	OC	MC	ESV	LSV
A. <i>hỏi</i> versus <i>sắc</i> (B1 vs. C1) – differing segments					
to marry	嫁 jià	*s.kʰra-s	kaeH	gả	giá
age	歲 suì	*s-qʷhat-s	sjweɰH	tuổi	tuế
measure for divinations	卦 guà	*[k]ʷʰre-s	kweaH	quẻ	quái
B. <i>ngã</i> versus <i>nặng</i> (B2 vs. C2) – differing segments					
word (in writing)	字 zì	*mə-dzə-s	dziH	chữ	tự
chopsticks	箸 zhù	*d<r>ak-s	drjoH	đũa	trợ
hat	帽 mào	*mʰuk-s	mawH	mũ	mạo
C. <i>ngã</i> versus <i>nặng</i> (B2 vs. C2) – the same segments					
two	二 èr	*ni[j]-s	nyijH	nhĩ	nhị
think	議 yì	*ŋ(r)aj-s	ngjeH	nghĩ	nghị
D. <i>Sắc</i> versus <i>hỏi</i> (C1 vs. B1) – differing segments					
noodles	粉 fěn	*mə.pənʔ	pjunX	bún	phấn ¹³
lord	主 zhǔ	*toʔ	tsyuX	chúa	chủ
paper	紙 zhǐ	*k.teʔ	tsyeX	giấy	chỉ
E. <i>Sắc</i> versus <i>hỏi</i> (C1 vs. B1) – the same segments					
light, glare	影 yǐng	*qraŋʔ	jaengX	ánh	ảnh
rather, very	可 kě	*[k]ʰʰa[j]ʔ	khaX	khá	khả
to order/bid	遣 qiǎn	*[k]ʰe[n]ʔ	khjienX	khiến	khiển
F. <i>nặng</i> versus <i>ngã</i> (C2 vs. B2) – differing segments					
father's younger brother	舅 jiù	*[g](r)uʔ	giuwX	cậu	cữu
net	網 wǎng	*maŋʔ	mjangX	mạng	võng
to wait	待 dài	*[d]ʰəʔ	dojX	đợi	đãi
G. <i>nặng</i> versus <i>ngã</i> (C2 vs. B2) – the same segments					
to receive, acknowledge	*rěn	*nə[n]ʔ	nyinX	nhận	nhẫn
cold	冷 lěng	NONE	NONE	lạnh	lãnh

While the data in this study undoubtedly does not include all possible ESV items, and more will likely be identified, the numbers of items in each category are already telling. While only 34 instances of the C-for-B type are in the data herein, there are at least 90 items of B-for-C type. The semantic categories of both types are varied, indicating no significant difference in sociolinguistic circumstances of borrowing. The significantly larger number of *sắc/nặng*-for- *hỏi/ngã* words makes sense considering the longer period during which the OC/EMC glottal stop may have lasted, than did the final fricatives, which were

13 The expected tone in this LSV word is the *hỏi* tone. The actual *sắc* tone may reflect a pronunciation retained from the pre-tonal period of Vietnamese, and thus it may also be a kind of ESV that became standard reading of the character 粉 fěn.

lost in OC a few centuries sooner. Moreover, among the ESV items, about 135 differ segmentally from their LSV counterparts, while only about 50 have the same segments. As will be shown in the next section, nearly half of those 50 are words with *ngang/huyền* tones in *qusheng* words. Assuming that ESV words with segments differing from the LSV layer are typically older than those with the same segments, a substantial percentage was borrowed in an earlier period, though details are sketchy at this point. Having provided such data, we can now review data of the instances of *ngang/huyền* tones in *qusheng* words.

5 Lexical Data for the *Ngang/Huyền* Tones in *Qusheng* Words

As described in Section 1, in available ESV data, a large number of items have level *ngang/huyền* tones (corresponding to MC *pingsheng* tones) in early Chinese loanwords which are words formally listed as having *qusheng* category tones, *sắc* and *nặng* tones, as they are in LSV words. The loss of OC *-s around the 3rd century CE was hypothesized by Pulleyblank 1962, and it is thus reasonable to consider this loss as a viable source of this otherwise unexpected tonal phenomenon in ESV vocabulary. That is, the loss of final fricatives in OC meant that Vietic speakers, whose phonological system lacked tones, could have only borrowed the segments of the words, which later resulted in level *ngang* and *huyền* tones in Vietnamese.

Like the alternation between *shangsheng* and *qusheng* between ESV and LSV strata, some of the ESV items with level *ngang/huyền* (*pingsheng*) tones for what are considered *qusheng* words also have segmental differences, but in a comparable number of instances, they do not. Also, unlike the alternation between ESV and LSV of *shangsheng* and *qusheng* categories, the pattern for the *ngang/huyền* tones in *qusheng* tone category words is one-sided: there are only *ngang/huyền* items in *qusheng* words, not *sắc/nặng* tones in *pingsheng* tone category words, which is expected as words with *pingsheng* tones are not conditioned by finals.¹⁴ Again, the consistency in tone height/register between the ESV and LSV counterparts strengthens the assertion that these are not the result of chance or irregularities due to random lexical borrowing. Table 14 shows four situations based on the two-tone register/heights and the segmental similarity to related MC forms. A majority of the ESV items have the same segments as in LSV, which highlights the relatively later historical starting point of this category compared to the *shangsheng/qusheng* phenomenon discussed in Section 4. Samples of all four categories are provided in Table 15.

Assuming ESV items with *ngang/huyền* tones in *qusheng* words are the result of borrowing Sinitic words after the complete loss of final fricatives, these words must have been borrowed from perhaps the early to mid-first millennium CE until the time Viet-Muong developed tones some centuries later. The relatively larger quantity of ESV items with the same segments as MC-era LSV words attests to this later time of borrowing of these items. Considering Table 1 in the first section, it appears that the amount of functional vocabulary was on the increase in the second half of the first millennium CE, an issue that

14 There are some instances, such as *mối* 'matchmaker' (SV *môi*, Chinese 媒 *méi*), *nghiễn* 'to grind' (SV *nghiên*, Chinese 研), among other instances which do appear reasonable candidates as Chinese loanwords despite the seeming tonal oddity (i.e. *qu*-for-*píng*). However, these are very small in number, and there is no apparent phonological source for *qusheng* tones on *pingsheng* words as the latter did not have final segments to influence the development of tone contour. It remains to be seen what other factors could have resulted in these forms (e.g. changes in the tone system of Viet-Muong, tonal morphology, irregular borrowing circumstances, etc.).

TABLE 14 ESV *Ngang/Huyền* Words versus LSV *Sắc/Nặng* Words (Category A vs. C)

ESV to LSV Tone Correspondences	Similarity to Segments in LSV	Quantity	Table
<i>Ngang</i> versus <i>Sắc</i> (A1 vs. C1)	differing	17	H
<i>Ngang</i> versus <i>Sắc</i> (A1 vs. C1)	the same	15	I
<i>Huyền</i> versus <i>Nặng</i> (A2 vs. C2)	differing	19	J
<i>Huyền</i> versus <i>Nặng</i> (A2 vs. C2)	the same	22	K
	TOTAL	64	

TABLE 15 Examples of Correspondences of ESV *Ngang/Huyền* versus LSV *Sắc/Nặng* Tones (Category A vs. C)

GLOSS	CHIN	OC	MC	ESV	SV
H. <i>Ngang</i> versus <i>Sắc</i> (A1 vs. C1) – differing segments					
saw (n.)	鋸 jù	*k(r)a-s	kjoH	cưa	cú
to shout/call	叫 jiào	*k ^h ewk-s	kewH	kêu	khiếu
to temper (of steel)	淬 cùi	*[ts ^h]ʰu[t]-s	tshwojH	tôi	thối
I. <i>Ngang</i> versus <i>Sắc</i> (A1 vs. C1) – the same segments					
belt (n.)	帶 dài	*C.t ^h a[t]-s	tajH	đai	đái
to encourage; advise	勸 quàn	*C.q ^{wh} ar-s	khjwonH	khuyên	khuyến
report to king	奏 zòu	*ts ^h o(?) -s	tsuwH	tâu	tấu
J. <i>Huyền</i> versus <i>Nặng</i> (A2 vs. C2) – differing segments					
then	便 biàn	*ben-s	bjienH	bèn	tiện
to wait for, desire	望 wàng	*maŋ-s	mjang	mòng	vọng
to smelt/forged	鍊 liàn	*[r]ʰen-s	lenH	rèn	luyện
K. <i>Huyền</i> versus <i>Nặng</i> (A2 vs. C2) – the same segments					
curtain; screen	幔 màn	*m ^h a[n]-s	manH	màn	mạn
sentiment	念 niàn	*n ^h im-s	nemH	niềm	niệm
rhyme	韻 yùn	*[m-q ^w] <r>i[n]-s	hwinH	vần	vận

highlights the persistent, substantial impact of the local Annamese Chinese group in northern Vietnam prior to tonogenesis in Vietic.

6 Implications of the Data: Perception of Sounds and the Relative Chronology of Tonogenesis

Wang (2006) asserts that OC may have had two classes of *qusheng* words: those with final *-s and those without it. Citing Ting's (1981) observations of SV vocabulary, Wang (2006:3–4) notes how Chinese *qusheng* words appear in all six tones in Vietnamese, essentially three different tone categories *pingsheng*,

shangsheng, and *qusheng* (not including *rusheng* in words with final p/t/k sounds). However, the data provided in Sections 3 and 5 explains how the three tone categories, becoming six with the split of tone height, can all come from the same *qusheng* category. The Chinese loanword data in Vietnamese supports claims that from LOC to EMC, there was a period of the loss of final fricatives, and it supports Pulleyblank's (1962) claim that this loss was complete by the mid-first millennium.

Thus, the data suggests ways to explain multiple strata of Chinese loanwords in Vietnamese by providing relative chronologies of the words, which in turn supports the relative chronology of Chinese tones in the first several centuries of the first millennium CE. This last section further explores the role of perception by Vietic speakers of Sinitic phonology and the impact all the data has on the timing of developments in both OC/Sinitic and early Vietic.

6.1 *The Role of Perception of Sounds*

Loanword phonology depends partly on the phonological systems of speakers of both donor and recipient languages. It has also been shown how loanword phonology depends upon both grammatical and perceptual factors of the speakers borrowing words, such as the work of Yip (2006), who presented data showing how consonants are recognized more faithfully than vowels.

In the case of SV loanwords, this is especially relevant to the matter of the final fricative and laryngeal sounds in question as the perception of these consonants appears to have been fairly consistent. OC *-s/-h was perceived in earlier periods by Vietic speakers, as the ESV data with *hỏi* and *ngã* tones attest. We can thus assume that the *ngang* and *huyền* tones in ESV vocabulary was not the result of Vietic lacking final fricatives, making Vietic speakers unable to perceive them or borrow words with those sounds. At the time of borrowing those words, there simply were no final fricatives in Sinitic for Vietic speakers to perceive. Moreover, the *ngang* and *huyền* tones in ESV words reflect perception of the loss of final *-s or *-h in Chinese but the lack of tonogenesis in Vietic. Had Vietic been tonal, the tones in borrowed words would likely have different tone categories and/or have been the same tones, as they are in LSV.

One possible complication is that while both Sinitic and Vietic have been reconstructed as having final glottal stop and fricatives, there are differences in final clusters. Final nasal-plus-glottal stop clusters (e.g. *-mʔ) are reconstructed in Proto-Vietic (and further back to Proto-Austroasiatic), while there are no final nasal-plus-fricative clusters, unlike those reconstructed in OC. However, apparently, Vietic speakers were able to perceive the latter clusters and borrow them with sufficient accuracy such that there is phonological consistency in most instances.

Another aspect worth noting is secondary features related to tones and the process of tonogenesis. Tones are often accompanied by phonation features (e.g. breathiness, glottalization, creakiness, etc.), and so such features were likely part of the tone system of MC. As noted, Sagart (1986:94) presents data from a variety of modern Chinese dialects in which the *shangsheng* and *qusheng* tones have glottalization and even glottal stops. Vietic also may have had phonation creakiness (Diffloth 1989), and the features of Vietnamese and process of development likely involved registral phonation features (e.g. Alves 1995, Thurgood 2002). How long such secondary phonation features remained in the variety of MC in northern Vietnam at that time, and how that affected the phonology of these loanwords in Vietic, cannot be readily ascertained at this point. Still, it appears likely that segmental phonemes were the key features, as demonstrated by the consistent patterns, and that phonation had little to no impact on the perception by Vietic speakers of Sinitic words.

Regardless, when final fricatives were lost in Sinitic and tone categories emerged, available data suggests Vietic speakers perceived the segments of those words and borrowed them with those phonemes, while contour tone phonemes, whether or not they perceived them, could not be borrowed. The level

ngang and *huyền* tone in these ESV items cannot be the result of a misperception of final consonants (even when they were in final clusters) in OC and MC as Vietic speakers did, as shown, borrow these in sizeable quantity. They were also able to distinguish voicing of initial consonants, as the regularity of tone height in ESV words shows.

6.2 The Sequence of Development of Tones in both Sinitic and Vietic and Triplet Loanwords

According to current hypotheses, OC *-s was lost sooner than the final glottal stop. The implication of this is that, while both ESV words with *hỏi/ngã* in *qusheng* words and those with *sắc/nặng* in *shangsheng* words were borrowed from the earliest period, the *hỏi/ngã* words, those coming from OC final fricatives, were only borrowed in that earlier period of the first few centuries CE, while the *sắc/nặng* words continued to be borrowed until into the second half of the first millennium. Correspondingly, there is a notably larger number of *sắc/nặng*-for- *shangsheng* words than *hỏi/ngã*-for-*qusheng* words, as noted in Section 4. Lastly, words with *ngang/huyền* tones in *qusheng* words were then borrowed starting from the later period from about the first few centuries CE until Vietic developed tones and *qusheng* category words could be borrowed directly with tones. The timing of Vietic tonogenesis is not certain, but we can speculate that it was a couple of centuries later than tonogenesis in Chinese, but somewhat prior to the period of Late MC.

Overall, the evidence strongly supports the notion that Chinese tonogenesis preceded Vietnamese tonogenesis. This also contributes, albeit indirectly, to the idea that tone systems were not borrowed, but rather that tonogenesis followed regional typological tendencies, as per Ratliff (2010). During the centuries-long contact, there was a long-term process of changes involving phonation features, changes in syllable structure and length, and loss of segments, all part of the contact that created the conditions for tonogenesis rather than simply borrowing of a tone system.

Combining understanding of ESV segmental phonology and the periods of tonogenesis in OC, we can identify triplets and provide relative chronologies for these items, as shown in Table 17. These triplets provide evidence of the OC final fricative of the *qusheng* category. Those ESV items with the earlier stage tones tend to have other segmental differences, further highlighting their age. More evidence that these items are triplets borrowed in multiple eras includes semantic differences among them within a general semantic domain, as in the case of *cũng* ‘also’, *cùng* ‘with’, and LSV *cộng* from Chinese 共 *gòng* but primarily as a bound morpheme (cf. Alves 2018). The tone categories (e.g. A1, C2, etc.) are listed next to each item. The first several follow the expected pattern of B, A, and C. The last two items, ‘ten thousand’ and ‘cage’ both have segmental differences, highlighting their age, but share tone categories with the later forms.

TABLE 16 History of ESV tones compared with Chinese Tone Development

Categories	Chronology
words with <i>hỏi/ngã</i> tones in <i>qusheng</i> words	Borrowed during the retention of OC final fricatives from the Han Dynasty to MC in the early part of the first millennium CE
words with <i>ngang/huyền</i> tones in <i>qusheng</i> words	Borrowed from the loss of OC final fricatives in the Han to Jin period to the end of the 1 st millennium CE
words with <i>sắc/nặng</i> tones in <i>shangsheng</i> words	Borrowed during the retention of OC *-ʔ from the Han Dynasty into MC in the Tang Dynasty in the second half of the first millennium CE

TABLE 17 Triplets

Gloss	Chinese	OC	MC	ESV – LOC/EMC	ESV – EMC/MC	SV – LMC
grave	墓 mù	*C.mʰak-s	muH	mả (B ₁)	mồ (A ₂)	mộ (C ₂)
disorder, rebellion	亂 luàn	*[r]ʰo[n]-s	lwanH	lẫn (B ₂ ‘to confuse’)	loàn (A ₂) ‘rebel’	loạn (C ₂) ‘confusion’
belt	帶 dài	*C.tʰa[t]-s	tajH	dải (B ₁)	đai (A ₁)	đái (C ₁)
with/also	共 gōng, gòng	*N- k(r)onʔ-s	gjowngH	cũng (B ₂) ‘also’	cùng (A ₂) ‘with’	cộng (C ₂)
interest; profit	利 lì	*C.ri[t]-s	lijH	lãi (B ₂)	lời (A ₂)	lợi (C ₂)
two	二 èr	*ni[j]-s	nyijH	nhĩ (B ₂)	nhì (A ₂) ‘second’	nhị (C ₂)
ten thousand	萬 wàn	*C.ma[n]-s	mjonH	muôn (A ₁)	vàn (A ₂)	vạn (C ₂)
cage, coop	籠 lóng, lồng	*k.rʰonʔ *k.rʰonʔ	luwng luwngX	chuồng (A ₂)	lồng (A ₂)	lung (A ₁) lộng (C ₂)
hit, kick	打 dǎ	NONE	NONE	đánh (C ₁) ‘to hit’	đá (C ₁) ‘to kick’	đả (B ₁)

SV lexical data has offered insight into Chinese historical phonology, particularly with respect to tones, and this is again the case in the loss of final OC fricatives as seen by tonal phenomena among SV strata. Some concluding thoughts are presented below.

- **Chronology:** The ESV and LSV data presented supports a chronology measured broadly in centuries, but still with enough precision to allow other sociohistorical studies of, for example, cultural domains in the Sinitic-Vietic contact. The number of words borrowed in each category corresponds to length of time, which offers supporting evidence for the timing of changes in both Sinitic and Vietic. The larger number of words with *sắc/nặng* tones in *shangsheng* words than words with *hỏi/ngã* in *qusheng* words is expected considering the several centuries during which the former could have been borrowed, but only a few centuries for the latter, though all were borrowed prior to tonogenesis in Viet-Muong.
- **Sinitic speech community:** A review of reconstructions of Proto-Tai (e.g. Li 1977 and Pittayaporn 2009) and Proto-Hmong-Mien (Ratliff 2010) shows that while a good number of words are shared by the speech communities, many if not most ESV words are not seen in the other language groups. Thus, these are loanwords directly borrowed from Sinitic rather than, for example, indirectly via Tai. Instead, the notable number of items supports the hypothesis of a large, sociolinguistically influential Sinitic speech community. Considering the geographically peripheral and somewhat isolated status of Jiaozhi (the part of northern Vietnam under Chinese administration for a thousand-year period), it is not unreasonable to assume that the variety of Chinese spoken in northern Vietnam, so-called Annamese Chinese, experienced tonogenesis in a somewhat different way and at a somewhat different timing than Sinitic in other parts further north.
- **Shared patterns of segmental loss:** The data provides an example of shared tendencies in loss of classes of sounds: loss of fricatives and glottal stop (laryngeals), as well as liquids (e.g. *r and *l), but retention of other stops (i.e. p/t/k) and nasals (i.e. m/n/ŋ). Such is the case in both Sinitic and Viet-Muong languages (though as noted, in various conservative southern Vietic languages, final /-h/ and /-l/ are retained), as well as in Tai and some Mienic languages.

One question that remains is how many of the ESV items with the same segments as LSV words are from the earlier period, perhaps before Sinitic fully developed tones, and how many were borrowed much later but still somewhat before Vietic became fully tonal. A fuller study of the segmental features with the proposed chronology in mind should further refine the history of Sinitic-Vietic language contact. Ideally, such historical linguistic information can inform ethnohistorians and archaeologists about human history in the region of northern Vietnam in the first millennium CE, the period of the end of the Dong Son archaeological culture and adoption and adaptation of Chinese culture.

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Appendix

Caveat: The ESV items in Tables A through K are determined to be of Chinese origins with medium to high certainty. The degree of certainty is based on patterns of semantic and phonological properties in addition to consideration of the semantic domains of the words and nature of the sociocultural contact between Sinitic and Vietic speakers in the first millennium CE. The possibility of chance similarity remains, and in fact, it is possible that some of the items listed herein are not Chinese loanwords. Nevertheless, the weight of evidence in terms of the significant number of items identified, especially those which are more specifically tied to early Chinese culture, and the consistency of phonological patterns—as presented in Section—makes it likely that most, and potentially all, of the items herein are genuine early Chinese loanwords in Vietnamese.

TABLE A *ESV hôi* in *yinqu* tone words, with segments differing from LSV counterparts

GLOSS	CHINESE	OC	MC	ESV	LSV
1. order, to	報 <i>bào</i>	*p ^ɿ uk-s	pawH	báo	báo
2. mustard plant	*jiè/gài	*k ^ɿ r[e][t]-s	keajH	cải	giới
3. transport	載 <i>zài</i>	*[ts] ^ɿ əʔ-s	tsojH	chở	tái
4. exchange, to	兌/兑 <i>duì</i>	*l ^ɿ ot-s	dwajH	dổi	đoái
5. marry, to	嫁 <i>jià</i>	*s.k ^ɿ ra-s	kaeH	gả	giá
6. chopped vegetables and meat	膾 <i>kuài</i>	*C.[k] ^ɿ [o][p]-s	kwajH	gỏi	khoái
7. to send	寄 <i>jì</i>	*C.[k](r)aj-s	kjeH	gửi/gởi	ký
8. relate/tell, to	計 <i>jì</i>	*k ^ɿ ij-s	kejH	kể	kế
9. lure, to	餌 <i>ě r</i>	*[C.]nə(ʔ)-s	nyiH	nhử	nh
10. lungs	肺 <i>fèi</i>	*p ^h ɿ[a][t]-s	phjojH	phổi	phế
11. measure for divinations	卦 <i>guà</i>	*[k] ^ɿ w ^ɿ re-s	kweaH	quẻ	quái
12. rabbit	兔 <i>tù</i>	*l ^ɿ a-s	thuH	thỏ	thổ
13. try, to	試 <i>shì</i>	*l ^ɿ ək-s	syiH	thử	thí
14. express, to	訴 <i>sù</i>	*s-ɿ ^ɿ ak-s	suH	tỏ	tổ
15. young	稚 <i>zhì</i>	*l ^ɿ rəj-s	drijH	trẻ	trĩ
16. age	歲 <i>suì</i>	*s-q ^{wh} at-s	sjwejH	tuổi	tuế

TABLE B *ESV ngã* in *yangqu* tone words, with segments differing from LSV counterparts

GLOSS	CHINESE	OC	MC	ESV	LSV
1. bellow	籲 <i>bèi</i>	NONE	NONE	bể	bị
2. word (in writing)	字 <i>zì</i>	*mā-dzə-s	dziH	chữ	tự
3. repair/treat, to	治 <i>zhì</i>	*l ^ɿ rə-s	driH	chữa	trị
4. ride (a horse)	騎 <i>jì</i>	*[g](r)aj-s	gje	cưỡi/cỡi	kị
5. also	共 <i>gòng</i>	*N-k(r)onʔ-s	gjowngH	cũng	cộng
6. bag	袋 <i>dài</i>	*Cə.l ^ɿ ək-s	dojH	đầy	đại
7. easy	易 <i>yì</i>	*lek-s	yeH	để	dị

TABLE B *ESV ngã in yangqu tone words, with segments differing from LSV counterparts (cont.)*

GLOSS	CHINESE	OC	MC	ESV	LSV
8. chopsticks	箸 zhù	*d<r>ak-s	drjoH	đũa	trợ
9. thank; take leave, to	謝 xiè	*sə-lAk-s	zjaeH	giã	tạ
10. interest (financial)	利 lì	*C.ri[t]-s	lijH	lãi	lợi
11. confused	亂 luàn	*[r]ʰo[n]-s	lwanH	lẫn	loạn
12. prominent	露 lù	*p.rʰak-s	luH	lỗ	lộ
13. hat	帽 mào	*mʰuk-s	mawH	mũ	mạo
14. go on foot, walk, to	步 bù	*mə-bʰa-s	buH	vã	bộ
15. draw/paint, to	畫/劃 huà	*C-gʷʰrek-s	hweaH	vẽ	họa

TABLE C *ESV ngã in yangqu tone words, with segments the same as in LSV counterparts*

GLOSS	CHINESE	OC	MC	ESV	LSV
1. fierce (of a storm)	暴 báo	*[b]ʰawk-s	bawH	bão	bạo
2. small shrine	廟 miào	*[m]raw-s	mjewH	miếu	miếu
3. two	二 èr	*ni[j]-s	nyijH	nhĩ	nhị
4. think, to	議 yì	*ŋ(r)aj-s	ngjeH	ngĩ	ngị

TABLE D *ESV sắc in yinshang tone words, with segments differing from LSV counterparts*

GLOSS	CHINESE	OC	MC	ESV	LSV
1. precious	寶 bảo	*pʰuʔ	pawX	báu	bảo
2. hammer, axe	斧 fǔ	*p(r)aʔ	pjuX	búa	phủ
3. noodles	粉 fěn	*mə.pənʔ	pjunX	bún	phấn
4. dip into liquid, to	蘸 zhàn	NONE	NONE	chấm	trám
5. behead, to	斬 zhǎn	*[ts]ramʔ	tsreamX	chém	trảm
6. cup (small bowl)	盞 zhǎn	*[ts]rarʔ	tsreanX	chén	trản
7. lord	主 zhǔ	*toʔ	tsyuX	chúa	chủ
8. contain, to	貯 zhù	NONE	NONE	chứa	trữ
9. bow, prostrate oneself, to	跪 guǐ	*[g](r)ojʔ	gjweX	cúi	quỳ
10. hit, to	打 dǎ	NONE	(děng)	đánh	đá
11. bottom	底 dǐ	*tʰijʔ	tejX	đáy	để
12. count, to	點 diǎn	*tʰemʔ	temX	đếm	điểm
13. cover up, to	奄 yǎn	*ʔ(r)omʔ	ʼjemX	ém	yếm
14. brocade/embroidered silk	錦 jǐn	*Cə.k(r)[ə]mʔ	kimX	gấm	cầm
15. chair	几/機 jī	*C.kr[ə]jʔ	kijX	ghế	kỷ
16. careful	謹 jǐn	*kə[r]ʔ	kj+nX	ghín	cẩn

TABLE D *ESV sắc in yinshang* tone words, with segments differing from LSV counterparts (*cont.*)

GLOSS	CHINESE	OC	MC	ESV	LSV
17. paper	紙 zhǐ	*k.teʔ	tsyeX	giấy	chỉ
18. well	井 jǐng	*C.tsenʔ	tsjengX	giếng	tỉnh
19. type	種 zhǒng	*k.tonʔ	tsyowngX	giống	chủng
20. widowed	寡 guǎ	*[C.k] ^w raʔ	kwaeX	góa	quả
21. wrap, to	寡/裹 guǎ	*[C.k] ^w raʔ	kwaX	gói	quả, khoả
22. mussel	蜆 xiǎn	NA	NA	hến	hiện
23. lacking	減 jiǎn	*k ^s r[ə]mʔ	keamX	kém	giảm
24. cocoon	繭 jiàn	*k ^s enʔ	kenX	kén	kiến
25. choose, to	揀, 柬 jiǎn	*k ^s r[a]nʔ	keanX	kén	gián
26. scissors	鉸 jiǎo	*mə- [k] ^s r[a]wʔ	kaewX	kéo	giảo
27. difficult	苦 kǔ	*k ^h aʔ	khuX	khó	khổ
28. agree/accept, to	肯 kěn	*k ^h əŋʔ	khongX	khúng	khẳng
29. secretive	謹 jǐn	*kə[r]ʔ	kj+nX	kín	cẩn
30. rudder/helm	舵 duò	*l ^s ajʔ	daX	lái	đà
31. paddy	稻 dào	*[l] ^s uʔ	dawX	lúa ¹⁵	đạo
32. dance, to	舞 wǔ	*k.m(r)aʔ	mjuX	múa	vũ
33. rootstock of lotus	藕 ǒu	*C.ŋ ^s (r)oʔ	nguwX	ngó	ngẫu
34. tile	瓦 wǎ	*C.ŋ ^w ra[j]ʔ	ngwaeX	ngói	ngoã
35. catch; be infected by	染 rǎn	*C.n[a]mʔ	nyemX	nhuộm	nhiễm
36. dry	燥 zào	*C.s ^s awʔ	sawX	ráo	táo
37. lacking/little	少 shǎo	*[s.t]ewʔ	syewX	thiếu	thiểu
38. tub	桶 tǒng	*[^s onʔ	thuwngX	thống	dùng
39. 1st earthly branch (rat)	子 zì	*[ts]əʔ	tsiX	tí	tử
40. purple	紫 zǐ	NONE	NONE	tiá	tử
41. mend, to	補 bǔ	*[Cə]-p ^s aʔ	puX	vá	bổ
42. board/plank	板, 版 bǎn	*C.p ^s ranʔ	paenX	ván	bản
43. thigh	髀 bì	*peʔ	pjieX	vế	bế
44. compare, to	比 bǐ	*C.pijʔ	pjijX	ví	tỷ
45. capital/funds	本 běn	*C.p ^s ə[n]ʔ	pwonX	vốn	bổn, bản
46. ugly, bad	醜 chǒu	*t.q ^h uʔ	tsyhuwX	xấu	xú

15 One reviewer commented on the seeming disparity of the rhyme. However, the diphthongization from *u to [uə] is a common feature of ESV.

TABLE E *ESV sắc in yinshang* tone words, with the same segments as *SV* counterparts

GLOSS	CHINESE	OC	MC	ESV	LSV
1. light, glare	影 yǐng	*qraŋʔ	jaengX	ánh	ảnh
2. feeling	感 gǎn	*kʰ[ə]mʔ	komX	cám	cảm
3. kick, to	打 dǎ	NONE	NONE	đá	đả
4. peck of	斗 dǒu, dòu	*tʰoʔ	tuwX	đấu	đấu; đấu
5. bet, to	賭 dǔ	*mǎ.tʰaʔ	tuX	đố	đổ
6. if/supposing	假 jiǎ	*Cǎ.kʰraʔ	kaeX	giá	giả
7. rather, very	可 kě	*[k]ʰʳa[j]ʔ	khaX	khá	khả
8. pray/promise, to	懇 kěn	NONE	NONE	khẩn	khẩn
9. order/bid, to	遣 qiǎn	*[k]ʰe[n]ʔ	khjienX	khiến	khiến
10. bright/shiny	朗 lǎng	*k.rʰaŋʔ	langX	láng	lãng ¹⁶
11. scrawling	草 cǎo	*[tsʰ]ʰuʔ	tshawX	tháu	thảo
12. order/bid, to	遣 qiǎn	*[k]ʰe[n]ʔ	khjienX	khiến	khiến
13. parasol	傘 sǎn	*[s]ʰarʔ	sanX	tán	tản

TABLE F *ESV nặng in yangshang* tone words, with segments differing from *LSV* counterparts

GLOSS	CHINESE	OC	MC	ESV	LSV
1. register book	簿 bù	*[b]ʰaʔ	buX	bạ	bộ
2. plait, to	辨 biàn	*m-pʰe[r]ʔ	benX	bện	biện
3. widowed	婦 fù	*mǎ.bəʔ	bjuwX	bụa	phụ
4. father's younger brother	舅 jiù	*[g](r)uʔ	gjuwX	cậu	cữu
5. sister, older	姊 zǐ	*[ts][i]jʔ	tsijX	chị	tỉ
6. market	市 shì	*C.[d]əʔ	dzyiX	chợ	thị
7. select	選 xuǎn	*[s]o[n]ʔ	sjwenX	chọn	tuyển
8. spur (of rooster)	距 jù	NONE	NONE	cựa	cự
9. stomach	肚 dù	*m-tʰaʔ	duX	dạ	đổ
10. wait, to	待 dài	*[d]ʰəʔ	dojX	đợi	đãi
11. stepfather	丈 zhàng	*[d]raŋʔ	drjangX	duợng	trượng
12. appointment	限 xiàn	*[g]ʰrə[n]ʔ	heanX	hẹn	hạn
13. family name	戶 hù	*m-qʰaʔ	huX	họ	hộ
14. tael	量 liàng	*[r]aŋ-s	ljangX	lạng	lượng
15. kowtow, to	禮 lǐ	*[r]ʰijʔ	lejX	lạy	lễ
16. silk	縷 lǚ	*[r]oʔ	ljuX	lụa	lũ

16 The low register tone on this word in the *LSV* layer cannot be readily explained, but this tone still belongs to the *shangsheng* tone category.

TABLE F ESV *nặng* in *yangshang* tone words, with segments differing from LSV counterparts (*cont.*)

GLOSS	CHINESE	OC	MC	ESV	LSV
17. gather, to	斂 liǎn	*[r][a]m?	ljemX	lượm	liễm
18. seedling	米 mǐ	*(C.)m ^ɛ [e]j?	mejX	mạ	mễ
19. net	網 wǎng	*maŋ?	mjangX	mạng	võng
20. strong	猛 měng	NONE	NONE	mạnh	mãnh
21. 4th earthly branch (rabbit)	卯 mǎo	*m ^ɛ ru?	maewX	mẹo	mảo
22. mother's younger brother's wife	姆 mǔ	*mə?	muwX	mợ	mỗ
23. every	每 měi	*m ^ɛ ə?	mwojX	mọi	mỗi
24. late	晚 wǎn	*m[o][r]?	mjonX	muộn	vãn
25. dye/infect, to	染 rǎn	*C.n[a]m?	nyemX	nhuộm	nhiễm
26. stamen, pistil	蕊 ruǐ	NA	NA	nhụy	nhị
27. wine/alcohol	酉 yǒu	*N-ru?	yuwX	rượu	dậu
28. expert	士 shì	*[m-s-]rə?	dzriX	thợ	sĩ
29. resemble, to	似 sì	*sə.lə?	ziX	tợ	tự
30. foreword	序 xù	*[sə.l]a?	zjoX	tựa	tự
31. misfortune	禍 huò	*[g] ^w aj?	hwaX	vạ	họa
32. wife	婦 fù	*mə.bə?	bjuwX	vợ	phụ

Note: Many of the LSV items in Table F have the *nặng* tone (and in Mandarin, many have the fourth tone, typically for *qusheng*, not *shangsheng* words), suggesting no change between ESV and LSV. However, these are all formally considered *shangsheng* words in the *Guangyun* rhyme dictionary and are reconstructed with the expected final glottal stops. LSV vocabulary shows the phenomenon of *quánzhuō shàng biàn qù* 全濁上變去, also seen in many of the Mandarin items as well. See Phan (2013:92–93) for background historical linguistic research on this issue.

TABLE G ESV *nặng* in *yangshang* tone words, with the same segments as LSV counterparts

GLOSS	CHINESE	OC	MC	ESV	LSV
1. cold	冷 lěng	NONE	NONE	lạnh	lãnh
2. receive, acknowledge	*rěn	*nə[n]?	nyinX	nhận	nhẫn

TABLE H *ESV ngang in yingqu tone words, with segments differing LSV counterparts*

GLOSS	CH	OC	MC	ESV	LSV
1. leopard	豹 bào	*pʰr[e]wk-s	paewH	beo	báo
2. sell	販 fàn	NONE	NONE	buôn	phán
3. release	放 fàng	*paŋ-s	pjangH	buông	phóng
4. abstain, to	戒 jiè	*kʰrək-s	keajH	cai	giới
5. admonish	諫 jiàn	*kʰranʔ(-s)	kaenH	can	gián
6. saw (n.)	鋸 jù	*k(r)a-s	kjoH	cửa	cứ
7. crowded, numerous	眾 zhòng	*tuŋ-s	tsyuwngH	đông	chúng
8. air; gas	氣 qì	*C.qʰəp-s	khj+jH	hơi	khí
9. seal; to print	印 yìn	*[ʔ]iŋ-s	jinH	in	ấn
10. shout/call	叫 jiào	*kʰewk-s	kewH	kêu	khiếu
11. respect (in compounds)	敬 jìng	*krenʔ(-s)	kjaengH	kiêng	kính
12. familiar with	慣 guàn	*kʰro[n]-s	kwaenH	quen	quán
13. shout; announce	譟 zào	*C.sʰaw-s	sawH	rao	táo
14. pardon, to	赦 shè	*[ʔ]Ak-s	syaeH	tha	xá
15. substitute, to	替 tì	*ŋʰi[t]-s	thejH	thay	thế
16. embroider	繡 xiù	*[s]iw(k)-s	sjuwH	thêu	tú
17. to temper (of steel)	淬 cuì	*[tsʰ]ʰu[t]-s	tshwojH	tôi	thối

TABLE I *ESV ngang in yinqu tone words, with the same segments as LSV counterparts*

GLOSS	CH	OC	MC	ESV	LSV
1. dish/bowl/pot; crock	盎 àng	NONE	NONE	ang	áng
2. help/save, to	救 jiù	*s.k(r)u-s	kjuwH	cứu	cứu
3. belt	帶 dài	*C.tʰa[t]-s	tajH	đai	đái
4. freeze, to	凍 dòng	*tʰoŋ-s	tuwngH	đông	đống
5. encourage; advise	勸 quàn	*C.qʰar-s	khjwonH	khuyên	khuyến
6. sesame	麻 má	*C.mʰraj	mae	mè	ma
7. manure	糞 fèn	*p[u]r-s	pjunH	phân	phấn
8. report to king	奏 zòu	*tsʰo(ʔ)-s	tsuwH	tâu	tấu
9. calculate	算 suàn	*[s]ʰorʔ-s	swanH	toan	toán
10. coal/charcoal	炭 tàn	*[tʰ]ʰa[n]-s	thanH	than	thán
11. sigh; lament	嘆 tàn	*ŋʰar-s	thanH	than	thán
12. truthful; believe	信 xìn	*s-ni[ŋ]-s	sinH	tín	tín
13. four	四 sì	*s.li[j]-s	sijH	tư	tứ
14. news (Ch. 'ask')	訊 xùn	*[s]i[n]-s	sinH	tín	tấn
15. measure for pictures	幀 zhēn	NONE	NONE	tranh	tránh

TABLE J   *ESV huyền in yangqu tone words, with segments differing from LSV counterparts*

GLOSS	CH	OC	MC	ESV	LSV
1. then	便 biàn	*ben-s	bjenH	bèn	tiện
2. oar (archaic)	棹 zhào	NONE	NONE	chèo	trạo
3. manner, appearance	樣 yàng	NA	NA	duờng	dạng
4. be addicted	健 jiàn	NA	NA	ghiền	kiện
5. summer	夏 xià	*[g] ^s raʔ	haeH	hè	hạ
6. cheap/low/mean	賤 jiàn	*[dz][a][n]-s	dzjenH	hèn	tiện
7. big junk (boat)	艫 měng	NONE	NONE	mãnh	mãnh
8. marvelous; miraculous	妙 miào	*[m]ew(?) ^s	mjiewH	mẫu	diệu
9. wait for, desire	望 wàng	*maŋ-s	mjangH	mòng	vọng
10. fog; mist	霧 wù	*kə.mok-s	mjuH	mù	vụ
11. taste (n.); smell	味 wèi	*mət-s	mj+jH	mùi	vị
12. ten thousand	萬 wàn	*C.ma[n]-s	mjonH	muôn	vạn
13. branch	梗 gěng	*k ^s raŋʔ	kaengX	ngành	ngạnh
14. profession	藝 yì	*ŋet-s	ngjiejH	nghe	nghe
15. prevent	禦 yù	*m-q ^h (r)aʔ	ngjoX	ngừa	ngự
16. moisten, to	潤 rùn	NA	NA	nhuần	nhuận
17. smelt/forge	鍊 liàn	*[r] ^s en-s	lenH	rèn	luyện
18. leak, to	漏 lòu	*[Nə-r] ^s ok-s	luwH	rò	lậu
19. control oneself; check oneself	慎 shén	*[d]i[n]-s	dzyinH	thìn	thận

TABLE K   *ESV Nouns and Verbs with huyền in yangqu tone words, with the same segments as LSV counterparts*

GLOSS	CH	OC	MC	ESV	LSV
1. use, to	用 yòng	*m.loŋ-s	yowngH	đung	dụng
2. jaw, chin	頤 hàn	*[g] ^s [ə]mʔ	homX ¹⁷	hàm	hạm
3. pole/stake to block invading ships	捍 hàn	*m-k ^s a[r]-s	hanH	hàn	hãn
4. important	* xì	*k ^s ek-s	kejH	hề	hệ
5. category	類 lèi	*[r]u[t]-s	lwijH	loài	loại
6. interest (financial)	利 lì	*C.ri[t]-s	lijH	lời	lợi
7. curtain; screen	幔 màn	*m ^s a[n]-s	manH	màn	mạn
8. big junk (boat)	艫 měng	NONE	NONE	mãnh	mãnh
9. art/skill	藝 yì	*ŋet-s	ngjiejH	nghe	nghe

17   Though this item is labelled with X, and hence a *shangsheng* tone, following Baxter and Sagart (2014), this item is labelled a *qusheng* tone in the later Guangyun rhyme dictionary. It is thus unsurprising that this item, as well as toà 'building (clsf)', have the same segments as in LSV as they are relatively later loans.

TABLE K   ESV Nouns and Verbs with *huyền* in *yangqu* tone words, with the same segments as LSV counterparts (*cont.*)

GLOSS	CH	OC	MC	ESV	LSV
10. outside	外 wài	*[ŋ] ^w a[t]-s	ngwajH	ngoài	ngoại
11. wish; promise	願 yuàn	*[ŋ]o[n]-s	ngjwonH	nguyên	nguyên
12. moisten, to	潤 rùn	NA	NA	nhuần	nhuận
13. yield	讓 ràng	*naŋ-s	nyangH	nhường	nhượng
14. sentiment	念 niàn	*n ^s im-s	nemH	niềm	niệm
15. allotted duty; part	分 fèn	*[m]-pə[n]-s	pjunH	phần	phận
16. swear	誓 shì	*[d][a]t-s	dzyejH	thề	thệ
17. left over	剩 shèng	*Cə.ləŋ-s	zyingH	thừa	thừa
18. building (clsf)	座 zuò	*[dz] ^f o[j]?-s	dzwaX ¹⁸	toà	toạ
19. self; from	自 zì	*s.[b]i[t]-s	dzijH	từ	tự
20. ten thousand	萬 wàn	*C.ma[n]-s	mjonH	vàn	vạn
21. rhyme	韻 yùn	*[m-q ^w <r>i[n]-s	hwinH	vần	vận
22. for; because	為 wèi	*G ^w (r)aj-s	hjweH	vì	vị

¹⁸ See footnote 16 for details about the tone category.

早期漢越詞匯數據與漢語越語聲調發展的相關年表

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提要

越南語有許多早期的漢語借詞，其中有一層有越南的 *ngang* 和 *huyền* 聲（相當於漢語的平聲）但卻應該有 *sắc* 和 *nặng* 聲（相當於去聲）。我們提出，這一早期漢越詞的層是上古漢語的 **-s* 已失去的和越芒語支（Viet-Muong）聲調發生之前的外來詞，因此在越芒語支聲調發生時，產生有平聲的詞。本文提供六十個早期漢越的例子，這些例證在去聲詞有 *ngang/huyền* 聲的現象，但也有一百二十個例子例證早期和後期漢越此之間的 *sắc/nặng* 和 *hỏi/ngã* 聲調逆轉。總之，這些證據供給在漢語支（Sinitic）和越語支（Vietic）中發展聲調的總體相對年表。

關鍵詞

漢越詞、漢語外來詞、聲調起因和發展