

# Diverse sources and an internal foundation for voiced onsets in Northern Mǐn

Jonathan Smith

Christopher Newport University

The voiced onsets and associated tonal reflexes of Northern Mǐn (NM), motivation for Norman's (1973; 1974) proto-Mǐn “softened” stops and affricates, remain a subject of controversy. Following a brief introduction (§ 1), I begin by reviewing the various apparent sources of voiced onsets in NM, including old koine complex onsets, non-Sinitic substrate, voicing alternations, and late koine material (§ 2). I then take up Akitani's (2008) colloquial glossary of Shíbēi 石陂 and Norman's (1969) of Jiànyáng 建陽, outlining on this basis an adjusted account of the subgroup's development: pre-PNM preserved early Sinitic voiced onsets in Tone A2, with a conditioned split isolating voiced stops in so-called *Yángpíng yì* 陽平乙, here “A2+” (§ 3). It was this conservative feature which allowed items in § 2 to take on voiced onsets across tonal categories, at times leading to further splits. A conclusion considers Mǐn more generally, proposing that the voicing alternants of Huang Chin-wen (2001a) may be NM reflections of group-wide tone sandhi processes (§ 4).

**Keywords:** Northern Mǐn, softened onsets, tone 9, tone sandhi, dialect contact

## 1. Introduction

The Mǐn group is often considered to have undergone an early registrogenesis and devoicing parallel to what is seen across most of Sinitic. However, the voiced onsets and associated tonal reflexes of the Northern Mǐn (NM) subgroup complicate this picture. Norman (1973; 1974) held that the NM situation required the reconstruction of two series of phonetically abstract “softened” onsets in proto-Mǐn (pMǐn). First, the peculiar tones and onsets of a few historical upper register words in NM could be accounted for by setting up a contrast between plain pMǐn \*T- (> NM T-) and Norman's softened \*-T- (> anomalous NM tones; D- or L- in some varieties). Second, the more pronounced tone and onset separation affecting NM historical

lower register words could be explained via a contrast between plain pMǐn \*D- (> NM devoiced T-) and softened \*-D- (> distinct NM tones and/or D/L-).<sup>1</sup>

In this study, following Akitani (2017), I define my focus in *prima facie* terms as the voiced onsets and associated tonal results of NM languages. That is, I avoid the assumption that the special onsets which drove NM developments descended from a single pMǐn class (like “softened” \*-T- and \*-D- in Norman 1973 and 1974 or unified Common Mǐn \*D- in Norman 2014).<sup>2</sup> This approach is preferable because recent studies have pointed to a number of distinct sources of voiced-onset words in NM, introduced in § 2 below, with only one – the complex onsets of § 2.1 – having clear implications for a stage prior to proto-Northern Mǐn (PNM). These younger and smaller classes do not themselves resolve the NM problem, however. In § 3, I examine the colloquial Shíbēi 石陂 and Jiànyáng 建陽 glossaries of Akitani (2008) and Norman (1969) respectively, outlining a new view of NM developments in light of this data and of suggestions of Huang Chin-wen (2001a). I argue that while pMǐn oblique tones were regularly affected by devoicing, voiced stop onsets survived in PNM Tone A2, giving rise to an “A2+” allo-tone (i.e., *Yángpíng yǐ* 陽平乙) and licensing the cross-tonal voiced-onset results of words from the sources in § 2.<sup>3</sup> Concluding thoughts are presented in § 4, with focus on an adjusted view of the voiced alternants of § 2.3 as NM reflections of typical Mǐn tone sandhi processes.

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1. I generally use T- and D- as cover symbols for voiceless and voiced obstruent onsets respectively, and L- for Jiànyáng 建陽-type continuants. Mǐn historical lower register aspirates are largely irrelevant to my discussion because this smaller class is shared across Mǐn (Akitani 2008: 24–25) and thus was established prior to the separation of NM. Handel (2010a: 58–59) presents some good reasons to doubt that it reflects an Old Chinese contrast, but the question is unresolved.

2. Norman’s Common Mǐn is mostly unpublished, but see Norman (2014), where Common Mǐn \*D- replaces earlier pMǐn \*-T- + \*-D-, and eight tones divided across two registers replace four tones. The NM problem remains, of course, as this \*D- ≠ Middle Chinese D-. Handel (2003) earlier took a similar approach to proto-NM; see also Sun Shun (2016).

3. *Jiǎ* 甲 vs. *yǐ* 乙 name dual NM voiced-onset vs. voiceless-onset analogues of MC tonal categories in Zhengzhang (1985), Ho (1996) (an English translation which substitutes “A” vs. “B”), and Huang (2001a). These designations are reversed in the work of Li Rulong (1991), Akitani (2008), and others, such that Zhengzhang’s voiced *yángpíng jiǎ* 陽平甲 becomes *yángpíng yǐ* 陽平乙, etc. Here I take Handel (2003) as model, writing A2+, etc., for early NM voiced-onset tones and adding A2–, etc., for voiceless-onset tones.

## 2. Multiple sources of voiced onsets in NM

In this Section and throughout, I most often cite NM varieties in which PNM onset voicing survives to the present. For my purposes, these are Shíbēi (SB) 石陂, where voiced obstruents D- may directly reflect the PNM situation (on SB see Zhengzhang 1985; Ho 1996; Norman 2000; Huang 2001a; Akitani 2008), and Jiànyáng (JY) 建陽, where the corresponding reflexes are continuants L- and at times Ø- (Norman 1969, 1971; Yue 2013; Shen 2016). Elsewhere in the NM subgroup, devoicing has yielded T- but with distinct tonal reflexes: the correspondences in question have been studied in detail by Handel (2003; 2009), Akitani (2008) and Sun Shun (2016).<sup>4</sup>

### 2.1 Source 1: Complex onset configurations

There are convincing indications from words shared between Chinese and non-Sinitic southern languages that NM voicing at times descends from earlier (pMǐn?) complex onsets, a research direction opened by Norman (1986; see also 1973: 237). For present purposes, “complex onsets” include prenasalized obstruents, Norman’s focus in 1986, but clusters proper or minor syllables could also have been involved. Importantly, this situation does not imply that complex configurations are the general solution to onset voicing in NM (see Sources 2–4 below; Handel (2010a: 56) and Akitani (2017: 69) also caution against such an overgeneralization.) In Table 1, I collect from Handel (2010a) as supplemented by Akitani (2017) all items in which Middle Chinese (MC) *T-* corresponds to NM D- and is also matched by complex onsets in proto-Hmong-Mien (pHM) (Ratliff 2010; Ostapirat 2011, 2016) and/or by voiced \*D- in proto-Tai (Li 1977). Following Akitani (2017), I set aside cases in which only voiced Mien (= Yao) parallels are available.<sup>5</sup>

Examples of this kind are quite conspicuous due to anomalous NM D- in historical upper register words, to follow abbreviated HUR D- (basis for Norman’s pMǐn \*-T-). However, analogous lower register examples presumably exist. For

4. The JY reflex of PNM \*b- has been represented in various ways (β-, w-, v-); here I use Norman’s (1969) v- ([v]). An expanded group of NM varieties categorized in terms of the occurrence of voiced obstruents, voiced continuants or voiceless obstruents for PNM \*D- is presented by Shen Ruiqing (2016: 13–15). As the author points out, these groupings do not have straightforward cladistic implications.

5. In Table 1, where both SB and JY are missing, see Akitani (2017) for other NM reflexes which support PNM voicing. For pHM, Ratliff (2010) is the main source, but I prefer Ostapirat’s (2016) pHM \*kl(v) in ‘dog’ and ‘pass’. For pTai, Tai Tone B = Sinitic C and C = B are regular associations. Finally, tonal register (“1”, “2”) is redundant with onset voicing in pHM and pTai, but I provide this information for clarity.

instance, Ostapirat (2011: 5) and Norman (2014: 11–12) mention cases in which Norman’s (2014) unusual correspondence between Common M̐n lower register \*d- (= his 1973 \*-d-) and MC *l-* has echoes outside of Sinitic. These include MC *li<sup>B</sup>* 鯉 ‘carp’ (\*m.r- in Ostapirat’s pHM and proto-Kam-Sui) and *lan<sup>B</sup>* 懶 ‘lazy’ (Ostapirat’s pHM \*ŋ.r-; pTai \*gr- at Norman 2014: 12).<sup>6</sup>

**Table 1.** NM “softened” onsets and parallels in Hmong-Mien and Tai after Handel (2010a), etc.

MC	<i>poj<sup>A</sup></i> 'collapse'	<i>pu<sup>B</sup></i> 'mend'	<i>pij<sup>C</sup></i> 'boil'	<i>tam<sup>A</sup></i> 'carry'	<i>tu<sup>B</sup></i> 'challenge'	<i>tsɔj<sup>A</sup></i> '憎'	<i>tsɔj<sup>A</sup></i> 'detest'	<i>tsaw<sup>B</sup></i> 'early'	<i>tsɛj<sup>A</sup></i> 'take by force'	<i>tsij<sup>B</sup></i> 'point'	<i>kæŋ<sup>A</sup></i> 'cogon grass'	<i>ku<sup>A</sup></i> 'mushroom'	<i>kuw<sup>B</sup></i> 'dog'	<i>kwa<sup>C</sup></i> 'pass'
SB	b. <sup>2</sup>	b. <sup>3</sup>	f. <sup>2</sup>	d. <sup>2</sup>	d. <sup>3</sup>	–	–	dz. <sup>3</sup>	–	f. <sup>3</sup>	–	f. <sup>2</sup>	f. <sup>3</sup>	g. <sup>2</sup>
JY	v. <sup>9</sup>	v. <sup>3</sup>	Ø. <sup>9</sup>	l. <sup>9</sup>	l. <sup>3</sup>	–	–	l. <sup>3</sup>	–	Ø. <sup>3</sup>	–	Ø. <sup>3</sup>	Ø. <sup>3</sup>	k. <sup>9</sup>
pHM		*mp. <sup>B1</sup>	*mp. <sup>C1</sup>	*nt. <sup>A1</sup>				*nts. <sup>B1</sup>			*Nk. <sup>A1</sup>	*ŋk. <sup>A1</sup>	*kl. <sup>B1</sup>	*klv. <sup>C1</sup>
pTai	*b. <sup>A2</sup>				*d. <sup>C2</sup>	*j. <sup>A2</sup>		*j. <sup>C2</sup>	*j. <sup>A2</sup>	*j. <sup>C2</sup>				

Differently than Sources 2–4 below, Source 1’s implications are apparently for pM̐n or indeed some earlier stage of Sinitic rather than for NM in particular. Norman (1986: 381) guessed that these shared forms were due to loaning from “some southern Chinese dialect with close affinity to the ancestor of present day Min,” to which compare Akitani’s (2017: 66–67) reference to a southern variety (or varieties) of early Sinitic.<sup>7</sup> Along with the important matter of direction of borrowing (examined in Ostapirat 2011 and 2016), I leave for elsewhere the problem of how to reconstruct Table 1 words in “OC” (on this issue see esp. Handel 2010a; Baxter & Sagart 2014: 186–187 represents one recent proposal.) That a few such complex forms existed at pM̐n or a similar stage is sufficient for discussion to follow. Do note that \*NT-, etc., are not reconstructable to pM̐n via the comparative method; rather, HM and Tai material is merely suggestive of such antecedents for a portion of NM HUR D- words.

6. Representation of MC morphemes here generally follows Baxter (1992), though I prefer phonetically explicit representations like *y-* for Baxter’s *h-*, *ɖ-* for *dr-*, *ʒ-* for *zy-*, *-æ-* for *-ae-*, *ŋ* for *ng*, etc., as well as A–D for tonal categories.

7. Also Ostapirat (2011: 7): “the southern OC dialect of two thousand years ago must have possessed such complex sounds that have been preserved in various forms in the ‘archaic’ Min dialects and in ‘foreign’ languages such as Tai and Miao-Yao.”

## 2.2 Source 2: Local and substrate words

While we lack a focused study of the subject, all authors recognize that some NM voiced-onset words are peculiar to the subgroup, to Mǐn as a whole, or to the broader region. In part, these will have entered from indigenous non-Sinitic languages. In Table 2, I present a few possible examples of such voiced-onset substrate morphemes in SB by reference to Akitani's (2008) glossary and to Akitani (2017), with underlined items belonging to NM more generally given cognates provided in those studies. Sole criterion for inclusion here is lack of a general Sinitic cognate as indicated by lack of a Chinese character representation in Akitani (2008, 2017).<sup>8</sup> This is a crude standard, but should be sufficient here as my interest is in the existence of this class rather than in its specific membership.<sup>9</sup>

**Table 2.** Possible substrate morphemes featuring voiced onsets in Shǐbēi in light of Akitani (2008; 2017)

SB tone	Examples
1	(none?)
2	<u>lau<sup>6</sup>bau<sup>2</sup>təu<sup>6</sup></u> □ □ 掉 'forget', ʔa <sup>7</sup> dai <sup>2</sup> 阿 □ 'paternal grandmother', diau <sup>2</sup> □ 'dry', dzain <sup>2</sup> □ 'thin (of porridge, etc.)', <u>ge<sup>2</sup>ge<sup>2</sup>tʰiu<sup>1</sup></u> □ □ 抽 'shiver', <u>faiŋ<sup>2</sup>pa<sup>3</sup>niŋ<sup>5</sup></u> □ 把年 'the past few years'
3	tʰa <sup>1</sup> baiŋ <sup>3</sup> □ □ 'not good', <u>bie<sup>3</sup></u> □ 'split open', ɛi <sup>3</sup> kia <sup>5</sup> ɔ <sup>3</sup> 屎 □ □ 'toad', ku <sup>7</sup> gyiŋ <sup>3</sup> 穀 □ 'winnowing fan'
5	gʷai <sup>5</sup> kʰe <sup>3</sup> le <sup>5</sup> □ 起來 'lift up', <u>fieŋ<sup>5</sup>te<sup>0</sup></u> □ 仔 'gizzard of bird'
6	dueŋ <sup>6</sup> □ 'to lose (a thing)'
7	<u>fi<sup>7</sup>(ko<sup>1</sup>)tɕia<sup>7</sup></u> □ (個) 隻 'this (one)', <u>fu<sup>7</sup>ko<sup>1</sup>tɕia<sup>7</sup></u> □ (個) 隻 'that (one)'

It is possible that general Sinitic cognates will still be found in some of these cases. In general, though, members of this (ultimately non-Chinese) class have little to do with the comparative Sinitic problem presented by NM's voiced onsets. This is because local words which entered Mǐn in particular, to say nothing of

8. I leave out Akitani's (2017: 41, 51) SB gai<sup>2</sup> 'to tie' and dy<sup>3</sup> 'hide' as the author points to close Sinitic parallels (MC *kej*<sup>C</sup> 繫 and Mand. *duō* 躲; SB voiced 'tie' is considered a product of voicing alternation by Huang 2001a: 51.)

9. In Table 2 and to follow, boldface type is used to mark the pertinent syllable or syllables of multisyllabic words. Approximate English renderings of Akitani's (2008) Chinese glosses are mine. SB Tone 7's only voiced onset is fi-; see Akitani (2008: 75–76). For SB tones, the etymological numbers employed here are 1 (mostly < historical A1), 2 (< A2, D2), 3 (< B1), 5 (< C1, A2, B2), 6 (< C2), and 7 (< D1) after Akitani (2008: 76–77); see also § 2.5. For possible Fúzhōu 福州 cognates of NM 'dry' and 'thin', see Norman (1996: 24–25).

words which entered PNM or its daughter languages in particular (after Mǐn registrogenesis), may well not conform to the distributions of historical voiced- and voiceless-onset words which characterize inherited Sinitic portions of Mǐn lexicons. Source 2 items’ distribution within NM tonal systems is an issue worthy of separate study. In SB, for instance, high Tone 1 [53] seems not to feature voiced-onset local words, but Tone 3, a nearly exclusive upper register class in Sinitic terms (descending from B1), is well represented. An additional complication is that some Source 2 items could belong at the same time to Source 1 above – having once had complex onsets – or to Source 3 below.

2.3 Source 3: Voiced members of NM voiceless-voiced alternant pairs

NM voicing alternation as described by Huang (2001a) involves historical upper register words (cf. Source 1); that is, these pairs could be reconstructed with Norman’s \*T- vs. \*-T- if projected to pMǐn. This phenomenon has been little discussed, but is probably of some significance. We are dealing with cases where NM languages show alternations between historically typical-looking voiceless-onset forms and historically anomalous voiced and tone-shifted counterparts, with distribution at times hinting at a syntactic or morphological cause. In Table 3, I present modern onsets and tones for examples from Huang (2001a: 39–55) in which alternations are found within SB and JY, leaving somewhat more detailed consideration to § 4 and the Appendix. I set aside the interesting issue of overlap between these words and Source 1 above (‘collapse’, ‘boil’, ‘carry’, ‘mushroom’).<sup>10</sup>

Table 3. Voicing alternation in Northern Mǐn after Huang (2001a)

MC	<i>pan</i> <sup>A</sup> 搬 'move'	<i>pen</i> <sup>A</sup> 斑 'spot'	<i>poj</i> <sup>A</sup> 崩 'collapse'	<i>pjij</i> <sup>C</sup> 沸 'boil'	<i>tan</i> <sup>A</sup> 擔 'carry'	<i>tan</i> <sup>A</sup> 單 'single'	<i>toj</i> <sup>C</sup> 戴 'wear'	<i>kaw</i> <sup>A</sup> 膏 'lard'	<i>kaw</i> <sup>A</sup> 高 'tall'	<i>ku</i> <sup>A</sup> 菇 'mushroom'
–V SB	p <sup>-1</sup>	p <sup>-1</sup>	?	(fɪ <sup>-1</sup> )	t <sup>-1</sup>	t <sup>-1</sup>	t <sup>-5</sup>	k <sup>-1</sup>	k <sup>-1</sup>	k <sup>-1</sup>
–V JY	p <sup>-1</sup>	p <sup>-1</sup>	p <sup>-1</sup>	p <sup>h-5</sup>	t <sup>-1</sup>	t <sup>-1</sup>	t <sup>-5</sup>	(ɣ <sup>-1</sup> )	k <sup>-1</sup>	?
+V SB	b <sup>-2</sup>	b <sup>-2</sup>	b <sup>-2</sup>	fɪ <sup>-2</sup>	d <sup>-2</sup>	d <sup>-2</sup>	d <sup>-2</sup>	g <sup>-2</sup>	fɪ <sup>-2</sup>	fɪ <sup>-2</sup>
+V JY	v <sup>-9</sup>	v <sup>-9</sup>	v <sup>-9</sup>	fɪ <sup>-9</sup>	l <sup>-9</sup>	l <sup>-9</sup>	l <sup>-9</sup>	ɣ <sup>-9</sup>	Ø <sup>-9</sup>	Ø <sup>-3!</sup>

10. In Table 3, SB is based on Huang (2001a) except for b- onset ‘move’, for which see Akitani (2008: 77). JY is based on Norman (1969) and Yue (2013), but for tonally aberrant ‘mushroom’, see Akitani (2017: 46). I present only a selection of Huang’s material, including exceptional-looking ‘boil’ (2001a: 42, Footnote 18). Huang explores a larger group of NM varieties including the Jiànǒu 建甌-like dialect underlying the *Jiànzhōu bāyīn* 建州八音 rime book (1795), and also considers example pairs whose members are split across different NM varieties.

We could propose that the upper, voiceless forms of Table 3 entered from a regional standard variety (cf. Source 4 below), while the lower, voiced forms represent native material (after all, we know HUR D- to exist in NM.) This may be correct in some cases, but is problematic as a general solution. We cannot claim that the correspondences MC *T-* : JY *T-* of Table 3 must always be due to contact only on the basis of the apparent fact that historical upper register voicing is a native feature. After all, the voiceless forms are equally reconstructable to PNM, and rimes appear colloquial in both voiced and voiceless items with the possible exception of ‘lard’ (where SB has distinct rimes). Neither can we disregard occasional differences in part of speech (voiced verbs and adjectives), valency (voiced transitives), etc., contrasts which are not typical of a colloquial vs. literary separation (see Huang 2001a: 40–41 and § 4).

While they do not directly address these alternations or the work of Huang (2001a), Baxter & Sagart (2014) do accept both members of such pairs, when found together in colloquially-oriented studies like that of Norman (1969), as equally native NM. However, projecting such doublets to earlier stages of Sinitic gives confusing results. For example, because NM (in contrast to Coastal Mǐn) lacks an analogue of MC *tam*<sup>C</sup> 擔 ‘load (n.)’, instead featuring its own historical Tone A pair ‘carry’ (voiced onset) vs. ‘load’ (voiceless onset), we wind up with *three* contrasting Old Chinese (and pMǐn) forms of obscure synchronic relation to one another. Evidence for the Table 3 alternations is restricted to NM, meaning that reference to pMǐn, let alone to OC, is premature. For purposes of discussion below, here I would simply acknowledge what Huang’s (2001a) data suggests on its face: NM voiced-onset alternants of historically regular voiceless-onset counterparts are one source of onset voicing in the subgroup. Also, if a process having such a phonological effect existed in early NM, there is every reason to suppose that historical lower register words which had undergone earlier devoicing could also have been subjected to it.

## 2.4 Source 4: Voiced-onset koine loans

Mixture of voiced- and voiceless-onset words in NM historical lower register tones is much more pronounced than the parallel upper register phenomenon. In 1973, as noted above, Norman accounted for this lower register divide via a pMǐn contrast between \*D- and softened \*-D-, with these two progressing respectively to Norman’s (1969) Proto Western Min ( $\approx$  current PNM) \*T- (> SB T- : JY T-) and \*D- (> SB D- : JY L-). A well-known complication is that large numbers of NM voiced-onset words entered the subgroup relatively recently from a dialect or dialects which retained lower register contrastive voicing. Hirata (1988) and Wang Futang (1994) considered this donor to have belonged to the neighboring

Wú group, famous for its preservation of onset voicing, while more recent studies see the effects of a voicing-conservative Táng-Sòng standard language (Li & Deng 2006; Tu 2013).<sup>11</sup> Baxter (2014: 69) presents clear NM evidence for such a donor, one he proposes to have been a Southern Sòng (1127–1279) variety of early Mandarin. My Table 4 is a reduced version of Baxter’s (2014: 57) Table 2, where voiced-onset loans are presented in terms of NM languages’ pervasive colloquial vs. literary doublets.

**Table 4.** NM native voiceless-onset vs. borrowed voiced-onset historical lower register words (Baxter 2014)

MC	<i>dej</i> <sup>B</sup> 弟 ‘younger bro.’	<i>deŋ</i> <sup>C</sup> 定 ‘fixed’	<i>dziŋ</i> <sup>D</sup> 疾 ‘illness’	<i>bjæŋ</i> <sup>A</sup> 平 ‘even’	<i>dju</i> <sup>C</sup> 住 ‘reside’	<i>dziŋ</i> <sup>C</sup> 自 ‘self’
SB col.	tie <sup>1</sup>	tiaŋ <sup>6</sup>	tɕi <sup>1</sup>	piaŋ <sup>5</sup>	tiu <sup>6</sup>	tɕi <sup>6</sup>
SB lit.	di <sup>5</sup>	deiŋ <sup>6</sup>	dzi <sup>2</sup>	beiŋ <sup>2</sup>	dzy <sup>6</sup>	dzu <sup>6</sup>
JY col.	tie <sup>5</sup>	tiaŋ <sup>6</sup>	tsoi <sup>8</sup>	piaŋ <sup>2</sup>	tiu <sup>6</sup>	tsoi <sup>6</sup>
JY lit.	loi <sup>5</sup>	loiŋ <sup>6</sup>	loi <sup>8</sup>	voiŋ <sup>2</sup>	ly <sup>6</sup>	lo <sup>6</sup>

Modern distributional differences are at times key to appreciating these distinct origins. For instance, as regards ‘illness’, Baxter (2014: 58 with reference to Akitani 2008) points to the contrast between the colloquial SB word tɕi<sup>1</sup> ‘pain’ and a literary dzi<sup>2</sup> marked by its occurrence in late disyllables. More crucial are segmental correspondences. Baxter (2014: 58) points out that in Table 4’s voiceless-onset members, analogues of MC *-ej* (‘younger brother’), *-eng* (‘fixed’), *-jæŋ* (‘even’), *-ɬ* (‘reside’) and *-ij* (‘self’) match established reflexes across NM inherited vocabulary. By contrast, he observes that voiced-onset members reflect late, northern features: analogues of MC *-ej* look like those of *-i/-ij* (compare Table 4 lit. ‘younger brother’ to, e.g., MC *sij*<sup>C</sup>: SB *ɕi*<sup>5</sup>: JY *soi*<sup>5</sup> ‘four’ at Baxter 2014: 62), and we find affricates rather than stops for MC retroflex stops (see SB lit. ‘reside’) as well as evidence of the centralization or “apicalization” of MC *-i/-ij* after dental sibilants in the donor variety (see SB and JY lit. ‘self’). Other late, extra-Mín changes, including labiodentalization, are on display elsewhere in this borrowed stratum (see detailed discussion in Baxter 2014: 59–68).

Worth scrutinizing, however, is Baxter’s (2014: 58) remark that “the tonal reflexes in the literary forms [of Table 4] are inconsistent with Proto-Mín plain voiced initials.” Baxter (2014) has presumed Norman’s pMín \*D- and \*-D-, implying

11. More specifically, Hirata (1988) and Wang (1994) suggest that this borrowing alone might be sufficient to account for the NM onset voicing problem. As shown by Handel (2003; 2009), Akitani & Handel (2012), and Akitani (2008; 2017), this is unworkable; see also to follow.



here on my reading that the Table 4 loans joined a softened \*-D- class *as such* as opposed to a plain \*D- class (compare also Baxter’s titular reference to “Northern Mǐn ‘softened’ initials in borrowed vocabulary.”) But the loans at issue, dating to around Sòng, concern PNM and/or individual daughter languages, not pMǐn. More cautiously, then, what we see in Table 4 is that (1) the inherited (“colloquial”) NM words, voiced in early Sinitic, have undergone devoicing, perhaps as part of a general process affecting Mǐn as a whole; and (2) centuries later, Baxter’s (2014) regional standard (“literary”) stratum entered PNM or its daughter languages, with voiced-onset words like those of Table 4 joining what must have been an extant class of voiced-onset words in NM (here see the equivalent point at Baxter 2014: 58–59.) *The origin and extent of this extant class is the crux of the NM problem.* Did this class really feature native NM reflexes of a pMǐn segment like Norman’s softened \*-D-, distributed across the early lower register but resistant to regular devoicing?

As Table 4 begins to make clear, short lists of decontextualized monosyllabic words or character readings (employed in most past discussions including Norman 1973 and 1974) will be of limited use in answering this question. Wherever phonology is insufficient for understanding doublet pairs (for instance, in Table 4 ‘illness’, SB tɛi<sup>1</sup> vs. dzi<sup>2</sup> and JY tsoi<sup>8</sup> vs. loi<sup>8</sup> have identical rimes), the actual distribution of the morphemes at issue within modern NM lexicons becomes an essential consideration. On top of this, we must deal with the accidental facts of what has survived or been recorded. Given the massive effects of contact on NM lexicons, it would be surprising if none of Norman’s examples of pMǐn \*D- vs. \*-D- turned out actually to reflect NM native vs. late, loaned items.<sup>12</sup> This concern is part of the motivation for the investigations in § 3 below, based on the extensive whole-word colloquial material available in studies like Akitani (2008) and Norman (1969).

Sources 1–4 are most important for discussion below, but one other possible source of NM voiced onsets deserves brief mention. Akitani (2017) suggests that in some cases NM voicing is due to secondary assimilatory processes within multisyllabic words. His central example is MC *pju*<sup>A</sup> 夫 ‘man’ (2017: 64–65): NM correspondences suggest PNM \*b-, but because distribution looks limited to cognates of Mand. *zhàngfu* 丈夫 (‘man’, etc., in NM), it seems we have an internal NM change /p/→/b/ (→/m/) / ɲ\_V.<sup>13</sup> Among others, ‘wife’ (MC *bjuw*<sup>B</sup> 婦) may be analogous: “softened” pMǐn \*-b- has been reconstructed here based on modern

12. The implicit claim of Norman’s early studies is that he has detected and removed loans of this kind; my point here is the practical difficulty of assessing this claim. For a complicated example, see Handel’s (2010b: 30–31) discussion of NM cognates of ‘Chinese character’, MC *dzi*<sup>C</sup> 字.

13. For instance, JY tio<sup>2</sup>mu<sup>5</sup>noij<sup>2</sup> □□人 ‘man’ (Norman 1969: 122; the word is historically aberrant in more than one respect) should apparently be represented “丈夫” given the similar NM words in Akitani (2017: 64).

NM b- ~ m- (e.g., Zhènqián 鎮前 *seŋ<sup>2</sup>mu<sup>5</sup>* 新婦 ‘daughter-in-law’; see Norman 1996: 36–37), but Norman (1986: 382) reports that this morpheme occurs only in disyllabic ‘daughter-in-law’ throughout Mǐn. If so, we have an NM change similar to that seen in ‘man’ above, and pMǐn \*-b- is spurious.

For now passing over this and other relatively minor issues, I conclude § 2 with thoughts on the implications of Sources 1–4 for a more complete understanding of the history of onset voicing in NM.

2.5 Towards a fuller solution to NM onset voicing

Analogy between the historical upper and lower register situations is a defining feature of Norman’s (2000, etc.) and Handel’s (2003) approaches to NM voicing. On such a view, we have pMǐn \*-T- vs. \*-D-, or a single PNM (or Common Mǐn) \*-D- across registers. By way of illustration, Table 5 presents SB as described in Handel (2003: 66). Note dual NM correspondents of all eight MC tone × register categories (and recall Handel uses “+” to mark emergent tones due to PNM \*-D-).<sup>14</sup>

**Table 5.** Historical upper and lower register dual tonal analogues of MC in Shíbēi after Handel (2003)

	A1	A2	B1	B2	C1	C2	D1	D2
#	1 T- [53]	2 > 5 T- [33]	3 T- [21]	4 > 1 T- [53]	5 T- [33]	6 T- [45]	7 T- [214]	8 T- [43?]
#+	1+ > 2 D- [31]	2+ > 2 D- [31]	3+ > 3 D- [21]	4+ > 5 D- [33]	5+ > 2 D- [31]	6+ > 6 D- [45]	7+ > 3 D- [21]	8+ D- [23?]

Differently, Zhengzhang’s (1985: 43) analysis of SB, and in fact also Norman’s (1969) earlier study of JY and Jiànǒu 建甌, sees dual tonal analogues of only historical lower register categories (Table 6; recall Zhengzhang’s *jiǎ* 甲 voiced and *yǐ* 乙 voiceless = A and B in Ho 1996).<sup>15</sup>

14. In Table 5, square brackets “[ ]” show the modern SB tone values provided by Handel (2003), and Arabic numerals give a modern etymological sequence 1, 2, 3, 5, 6, 7, 8, 8+ (“>” indicates mergers.)

15. In Table 6, square brackets “[ ]” show the modern SB tone values provided by Zhengzhang (1985), and Arabic numerals give a modern etymological sequence 1, 2, 3, 5, 6<sub>A</sub>, 6<sub>B</sub>, 7 (“>” indicates mergers); compare Akitani’s (2008: 76) 1, 2, 3, 5, 6, 7. Note that Zhengzhang (1985) does not show historical D2 to break in SB; see below.

**Table 6.** Historical lower register dual tonal analogues of MC in Shǐbēi after Zhengzhang (1985)

	A1	A2	B1	B2	C1	C2	D1	D2
甲/A		2 <sub>A</sub> > 2		4 <sub>A</sub> > 5		6 <sub>A</sub>		
	1	D- [42]	3	D- [33]	5	D- [24]	7	8 > 2
乙/B	T- [53]	2 <sub>B</sub> > 5	T- [31]	4 <sub>B</sub> > 1	T- [33]	6 <sub>B</sub>	T- [214]	D/T- [42]
		T- [33]		T- [53]		T- [55]		

Which of these descriptions is preferable? Given discussion above, it is not hard to see why upper register voicing would have been set aside by Zhengzhang (1985) (and Norman 1969). It is small in scale, seeming to involve only relative rarities like reflexes of old complex-onset words, voiced-onset words from substrate, and voiced alternants (Sources 1–3).<sup>16</sup> On the other hand, HUR D- is a distinguishing feature of NM, making its incorporation by Norman (1973) and Handel (2003) understandable. It may be useful to recall that there are likely a similar number of Source 1–3 words in historical lower register tones – which makes NM HUR D- look a bit less exceptional. We could then reason that NM voicing appears disproportionately in the historical lower register simply because late voiced-onset loans (Source 4) entered only these categories. That is, perhaps an early Mǐn registrogenesis led to devoicing in the regular manner, but with rare pMǐn \*NT/\*ND-, etc. (Source 1) yielding a new PNM \*D- in both historical registers (here compare Handel 2010a: 55, Table 17). Around and after PNM, a few local/substrate words (Source 2) and voiced alternants of voiceless words (Source 3) joined this historically novel \*D-, again across tonal categories. Last of all, NM D- was dramatically inflated by the entry of large numbers of koine loans into historical lower register tones (Source 4). This possibility, serving also to summarize discussion in § 2.1–4 above, is presented in Table 7.

**Table 7.** Four sources of voiced onsets in PNM and/or early NM daughter languages

Historical upper register tonal categories	<i>NM voiceless (typical)</i>	pMǐn *T- > NM T- (also loans T- > NM T-)	
	<i>NM voiced (Sources 1–3 all rare)</i>	(1) pMǐn *NT- (etc.) > NM D- (2) Indigenous language D- (etc.) > NM D- (3) NM D- alternants of NM T- words from pMǐn *T-	> tone splits

16. That is, on a Table 5 approach, a rather small number of words forces us to a very complex “post-registrogenesis” PNM tonal framework (sixteen tones, or close to it). I revisit this problem briefly in § 4 below.

Table 7. (continued)

Historical lower register tonal categories	NM voiceless (typical)	pMín *D- > NM T- (assuming regular devoicing across tones)	
	NM voiced (Sources 1–3 rare; Source 4 common in learned vocabulary)	(1) pMín *ND- (etc.) > NM D- (2) Indigenous language D- (etc.) > NM D- (3) NM D- alternants of NM T- words from pMín *D- (4) Sòng koine D- > NM D-	> tone splits

However, this adjusted view cannot resolve the NM problem entirely. As I see it, there are three key issues:

- We may not wish to claim that a very small number of complex onset words with \*NT- or the like in pMín were capable of yielding an entirely new class \*D- in NM – and why should such onsets have proceeded to novel \*D- just in PNM, while giving \*T- in other Mǐn? Neither do we see elsewhere in Sinitic the possibility for voiced D- to be borrowed as such into devoiced varieties. This special capacity in NM would be easier to understand if there really were some additional internal source of NM D-. Therefore, for now, Norman’s (1973) pMín lower register “softened” \*-D- probably remains a useful abstraction.
- Akitani (2008: 77), recalling Zhengzhang (1985), describes an allotonic separation of voiced C2+ [355] from devoiced C2– [455] in SB, while others do not (Huang 2001a; Handel 2003). At the same time, Handel (2003: 66 Footnote 23, 70) describes an allotonic separation of voiced D2+ [23ʔ] from devoiced D2– [43ʔ] in SB, while others do not (contrast Zhengzhang’s merger of a unitary 8 with Tone 2 in Table 6.) Among the eight NM varieties shown by Handel (2009: 2, Table 1), two show no B2 tonal break, six no C2 break, and four no D2 break (cf. Akitani 2008: 70–71). A successful analysis will need to address the unevenness of historical lower register oblique-tone splits along onset voicing lines in NM, including ongoing and allophonic splits in SB.
- Finally, no past proposal has dealt adequately with the NM tonal categories A2+ and A2– (= *Yángpíng jiǎ* 陽平甲 and *Yángpíng yǐ* 陽平乙 in Zhengzhang (1985: 43), with many scholars now reversing these terms; 2+ and 2 in Handel 2003.) Crucially, this A2 break, unlike those affecting B2/C2/D2, looks diagnostic in NM (cf. Akitani 2013: 310, 318).<sup>17</sup> Also, Hirata (1988: 14) examines the 88 JY (Hòushān 後山) Tone 9 words of Norman (1971) and finds fully 64

17. And arguably in a larger group incorporating the Shào–jiāng 邵將 varieties, still Northern Mǐn (*Mǐnběi* 閩北) to Branner (2000) but in Akitani (2013: 318) termed Northwestern Mǐn (*Mǐn xībèi qū* 閩西北區).

to belong to historical A2, with Yue (2013: 53) reporting a similarly unlikely skew in JY Liándūn 連墩. As has long been recognized, Norman's approach provides no natural way of accounting for this dramatic imbalance: some A2-specific behavior must be involved. On top of this, both Hirata (1988) and Yue (2013) describe a stark colloquial (JY Tone 9 < A2+) vs. literary (JY Tone 2 < A2-) divide in JY, with JY L- corresponding to MC *D-* in *both* groups – a clue left unaddressed on Norman's analyses.

While past authors take different views of the comparability of the NM upper and lower registers, all have implied that the separations affecting NM level and oblique tones have equivalent causes. Given the points just above, this assumption looks doubtful. By reference to fuller colloquial NM data, my goal in § 3 below is to scrutinize modern items belonging to historical lower register tones, including possible relationships to Sources 1–4 above. In particular, I consider the question of whether some additional internal source of modern voiced onsets akin to Norman's pMǐn \*-D- is really required.

### 3. NM in light of historical lower register voiced onsets in Shíbēi and Jiànyáng

In § 3.1–§ 3.3, I examine all words featuring historical voiced obstruent onset morphemes in Akitani's (2008: 298–342) glossary of colloquial SB.<sup>18</sup> More briefly, much the same is undertaken in § 3.4 for Norman's (1969: 79–141) glossary of colloquial JY. That is, this section attempts a thorough survey of a well-defined body of ostensibly colloquial NM material with respect to the lower register tones. I then present a tentative new view of NM developments in light of this data and related observations. Norman (1996), focused on colloquial Zhènqián (ZQ), makes for useful comparison, and brief remarks on this material conclude § 3.2. One point which must be kept in mind throughout is that even given highly colloquial material, we cannot entirely escape the effects that standard and/or neighboring languages have had on NM lexicons.

18. I include MC *b-* 並, *d-* 定, *g-* 群, *y-* 匣, *dz-* 從, *z-* 邪, *dz-* 崇, *d-* 澄, *dž-* 禪, *ž-* 船, and also *hj-* 云 since its typical SB analogues ʔ- and f- resemble a voiceless/voiced obstruent pair. While these categories provide a useful organizational framework, recall it is not the case that NM descended directly from an MC-type language; rather, NM and medieval languages resembling MC share a common ancestor (≈ OC).

### 3.1 Tone C2 D- in Shǐbēi

Norman's proposals suggest that MC *D-* Tone C should correspond both to SB *D-* Tone 6 (< PNM "C2+") and to SB *T-* Tone 6 (< "C2-") in the native stratum. The popular SB words in Akitani's (2008) glossary provide very little support for this idea. Instead, the correspondence MC *D-* Tone C : SB *T-* Tone 6 is the rule, resembling Mǐn generally:

(MC *b-*) ts<sup>h</sup>u<sup>6</sup>paŋ<sup>6</sup> 口病 'see a doctor' | fie<sup>2</sup>paŋ<sup>6</sup> 食飯 'eat a meal'<sup>19</sup> | (d-) tuai<sup>6</sup>ʔəŋ<sup>1</sup> 大翁 'paternal grandfather's father' | tai<sup>6</sup>xu<sup>1</sup>təu<sup>5</sup> 逮後頭 'call wife's relations' | təu<sup>6</sup>te<sup>0</sup> 豆仔 'soybean' | (g-) ky<sup>6</sup>te<sup>0</sup> 櫃仔 'grain cabinet' | (ɣ-) keiŋ<sup>1</sup>xa<sup>6</sup> 今下 'right now' | ka<sup>6</sup>gi<sup>2</sup> ~ xa<sup>6</sup>gi<sup>2</sup> 下棋 'play chess' | xua<sup>6</sup> 畫 'drawing (n.)' | ʔua<sup>6</sup> 話 'speak'<sup>20</sup> | (dz-) tu<sup>1</sup>tɕi<sup>6</sup> 獨自 'oneself' | tɕiu<sup>6</sup>ɕi<sup>1</sup> 就是 'only' | (d-) ty<sup>6</sup> 箸 'chopsticks' | (dz-) ti<sup>6</sup> 事 'work (n.)'<sup>21</sup> | (dz-) ni<sup>2</sup>tɕiəŋ<sup>6</sup> 日上 'daytime' | pa<sup>7</sup>niŋ<sup>5</sup>ky<sup>1</sup>ɕiu<sup>6</sup> 百年歸壽 'deceased'<sup>22</sup> | (z-) sueiŋ<sup>6</sup>ɕiu<sup>3</sup> 順手 'right hand' | (hj-) ʔiəŋ<sup>5</sup>ʔy<sup>6</sup>təu<sup>5</sup> 洋芋頭 'potato'

In most cases, these morphemes look like native Mǐn reflexes of historical voiced-onset etyma (although other Mǐn or late standard language loans certainly can occur.) The few additional examples in Huang's (2001a) more specialized SB glossary behave similarly (MC *d-* tu<sup>6</sup>təu<sup>5</sup> 渡頭 'ferry crossing'; MC *z-* sion<sup>6</sup>gi<sup>2</sup> 象棋 'chess'). By contrast, in Akitani's (2008) glossary I find only four historical C2 morphemes with SB voiced onsets. It seems possible that the recognized sources of NM voicing described in § 2 above are just what is called for to account for these items:

- *Sources 1 ~ 2* (complex onsets and/or local words): SB du<sup>6</sup> 脰 'neck' (MC *d-*) is an NM reflection of a characteristically Mǐn morpheme (see Lǐ Rúlóng 2011). A remark attributed to Hé Xiū 何休 (129–182 C.E.) in commentary to the *Shǐ jì* 史記 associates this word with "the language of [the eastern state/region of] Qí" 齊語 (Schuessler 2007: 216). Baxter & Sagart (2014: 184) spec-

19. Under MC *b-*, I remove tɕiau<sup>1</sup>xu<sup>6</sup>ma<sup>3</sup> 招駙馬 'have son-in-law reside in bride's household', where MC *b-* : SB *x-* points to influence from a labiodentalized koine.

20. SB *x-* is common in cognates of MC *ɣ-* words, while *k/k<sup>h</sup>-* and *ʔ-* appear less often; see Akitani (2008: 81–82) and to follow. 'Draw' and 'speak' also have SB *fi-* reflections, for which see § 4.

21. MC retroflex affricates occasionally have dental-onset NM cognates, a distinctive Mǐn feature; see Akitani (2008: 80).

22. Both affricates and fricatives appear in voiceless NM cognates of MC *dz-* words. Here compare JY to<sup>7</sup>tɕion<sup>6</sup> 桌上 'on the table' to pai<sup>5</sup>siu<sup>6</sup> 拜壽 'to greet on one's birthday' in Norman (1969), and see also SB 'quicklime' vs. 'if' in § 3.2 below. Also, in contrast to the morpheme 'on' (see 'daytime'), the B2 verb 'go up' was voiced in early NM, for which see below and § 4.

ulate that this southeastern ‘neck’ is shared with Mon-Khmer (they cite a Rục /kadək/ ‘nape of the neck’, reminding also of Source 1 complex onsets.) As has been noted, caution is called for in considering such words’ implications for the history of Mǐn and of Sinitic more generally.

- *Source 3* (voiced alternants): SB bi<sup>6</sup> 鼻 (MC *b-*) ‘to smell’ is historically speaking a derivative or allomorph of ‘nose’; cf. SB p<sup>hi</sup>6təu<sup>5</sup> 鼻頭 ‘nose’. The lower register aspirated class was established in early Mǐn and was to lose contrastive voicing throughout the group, thus ‘nose’ is everywhere voiceless aspirated. Similar ‘nose’/‘smell’ contrastive pairs are common in Mǐn (Wāng & Akitani 2014: 701–702; Akitani 2008: 250). However, the voiced-onset verb is uniquely NM (or uniquely retained there), and parallels the behavior of Huang’s (2001a) NM historical upper register voiced alternants of voiceless-onset words (see § 4).
- *Source 4* (loans): SB dzo<sup>3</sup>fiu<sup>6</sup> 左右 ‘approximately’ (MC *hj-*) and dzeiŋ<sup>6</sup> 淨 ‘exclusively, entirely’ (MC *dz-*) must come from a koine like that of Baxter (2014). ‘Left’ shows monophthongization of early \*-aj (> MC *-a* > northern -ɔ, etc.), a change not found in native Mǐn (Baxter 2014: 59–61). As for ‘right’, contrast SB ‘potato’ (lit. ‘Western taro’) above: SB ʔ- vs. fi- look in part like native and loaned analogues of MC *y/hj-* (examples at Akitani 2008: 82).<sup>23</sup> Also, ‘approximately’ and ‘exclusively’ do not employ basic Mǐn morphemes for ‘left’/‘right’ (for which we find cognates of MC *pjon*<sup>B</sup> 反 or *taw*<sup>B</sup> 倒 vs. *žwin*<sup>C</sup> 順 or *tseŋ*<sup>C</sup> 正) or for ‘clean’ (various items; cf. Norman 1969 JY la<sup>5</sup>loi<sup>5</sup> and Akitani 2008: 193 SB li<sup>6</sup>lai<sup>5</sup>). Instead, both reflect semantic shifts belonging to extra-Mǐn Chinese. Neither are these two words consistently attested in other NM varieties (see Akitani 2008: 331 items 450 and 451).

A possible implication of these popular SB words is that pMǐn \*D- in Tone C2 was regularly devoiced to PNM \*T- > SB T- Tone 6. The small number of SB D- items are apparently due to the sources of § 2 above.

### 3.2 Tones B2 and D2 D- in Shǐbēi

Norman’s proposals suggest that MC Tone B2 voiced obstruent onsets *D-* should correspond both to SB D- Tone 5 (< PNM “B2+”) and to T- Tone 1 (< “B2–”)

23. For MC *y-* 以 and *hj-* 云, Akitani (2008: 82) lists 29 SB ʔ- example morphemes and 32 SB fi- example morphemes, but I find the latter set to be of marked literary character. In ‘left’ SB *dz-* is odd on any analysis as voiced obstruents generally do not occur in SB Tone 3 (< B1). See Akitani (2008: 77), where this and a few other anomalously voiced SB syllables appear literary in nature.

in the native stratum (see Table 5, Table 6, and cf. Akitani 2008: 93). However, in Akitani's (2008) glossary, the correspondence MC *D-* B2 : SB *T-* 1 looks like the rule, again paralleling the situation across Mǐn:

(MC *b-*) po<sup>1</sup> 抱 'embrace'<sup>24</sup> | (*d-*) tie<sup>1</sup>te<sup>0</sup> 弟仔 'younger brother' | (ɣ-) pɔ<sup>7</sup>xu<sup>1</sup> 背後 'behind'<sup>25</sup> | (*d-*) tiɔŋ<sup>1</sup>xu<sup>1</sup>nein<sup>5</sup> 丈夫 'man'<sup>26</sup> | (*dʒ-*) le<sup>5</sup>ɕi<sup>1</sup> 口是 'if' | (*hj-*) lɔ<sup>2</sup>xy<sup>1</sup> 落雨 'to rain'<sup>27</sup>

As for D2, applying Norman's ideas to the description of Akitani (2008) suggests that this category should find reflection in both native SB *D-* Tone 2 (< PNM "D2+") and *T-* Tone 1 (< "D2-"). Again, however, MC *D-* D2 : SB *T-* 1 is the rule in the data under consideration:

(MC *b-*) tən<sup>1</sup>pa<sup>1</sup>tɕiu<sup>3</sup> 冬白酒 'kind of *huangjiu* or yellow wine' | (*d-*) tu<sup>1</sup>tɕi<sup>6</sup> 獨自 'oneself' | (ɣ-) xo<sup>1</sup>dɔ<sup>2</sup> 核桃 'walnut'<sup>28</sup> | (*dz-*) tsai<sup>1</sup>ʔo<sup>5</sup> 截禾 'reap paddy' | tɕi<sup>1</sup> 疾 'be painful' | (*z-*) pin<sup>3</sup>ɕi<sup>1</sup> 扁食 'wonton'<sup>29</sup> | (*d-*) tɔ<sup>1</sup> 擇 'choose' | (*ʒ-*) tsa<sup>7</sup>ɕi<sup>1</sup> 扎實 'stable' | (*dʒ-*) tɕio<sup>1</sup>xo<sup>1</sup> 石灰 'quicklime'

Just as in C2, there are relatively few historical B2 or D2 morphemes which have SB *D-* Tone 5 or *D-* Tone 2 respectively in Akitani's (2008) glossary. Again, the categories of § 2 prove pertinent:

- *Sources 1 ~ 2* (complex onsets and/or local words): SB lye<sup>2</sup> 舌 'tongue' (MC ʒ-) and du<sup>33</sup>te<sup>0</sup> 苧仔 'ramie, kind of hemp' (MC *d-*) are comparable cases. Lateral-onset 'tongue' is common in NM (Norman 1996: 38), and while such forms are idiosyncratic from the standpoint of Norman's suggested Sinitic correspondences, it is true that they are reminiscent of other southern lan-

24. In MC *b-*, again I leave out examples where SB *x-* reflects northern labiodentalization: seiŋ<sup>1</sup>xu<sup>1</sup> 新婦 'daughter-in-law' (note the contrast with the NM words of § 2.4), su<sup>1</sup>xu<sup>1</sup> 師父 'craftsperson', and ɕy<sup>1</sup>xu<sup>1</sup> 舒服 'comfortable'.

25. Compare the doublet SB xəu<sup>6</sup>, which appears late given distribution (Akitani 2008: 110).

26. The first syllable, tiɔŋ<sup>1</sup>, looks typical of native NM/Mǐn, while *x-* in xu<sup>1</sup> shows effects of dialect contact. Here see discussion in § 2.4 above and Akitani (2017: 66); other NM varieties have labials in cognate words.

27. SB *x-* is unusual as an analogue of MC *hj-*; see Akitani (2008: 78).

28. 'Walnut' must be late ('peach' itself is SB thɔ<sup>5</sup> at Akitani (2008: 102) and aspirated across Mǐn), although its apparent modified-modifier structure is reminiscent of southern Sinitic substrate in a general way.

29. Probably 'wonton' is a loan given the rime difference between this SB ɕi<sup>1</sup> 食 'food' and fie<sup>2</sup> 食 'eat', but it is possible that the former morpheme appears in other colloquial SB words; see § 4.



guages. As Norman (1986: 383) notes, Purnell (1970: 214) has pHM \*nbret<sup>D</sup>; more recently, Ratliff (2010: 27) reconstructs \*mblet<sup>D</sup>. In just the same way, ‘ramie’, a word of pronounced regional character, has a clear analogue in pHM \*ndu<sup>C</sup> ‘ramie, hemp’ (Ratliff 2010: 263). Earlier Strecker (1987: 49) had \*ndo<sup>C</sup>; cf. at Purnell (1970: 98).

- *Source 3* (voiced alternants): ‘above’ (MC *dz-* C2) has both fñ- and tɕ- reflections in colloquial SB, with cognates across NM: compare SB *hiŋ<sup>5</sup>məŋ<sup>5</sup>* 上門 ‘go to live with wife’s family after marriage’ with ni<sup>2</sup>tɕiŋ<sup>6</sup> 日上 ‘daytime’ (see § 3.1), etc. B2 verb vs. C2 postposition is expected given general Sinitic, but the additional onset difference – the verb enters a voiced tone (“B2+”) but the postposition a voiceless one (“C2–”) – requires an NM-internal explanation, without which we will face an awkward proliferation of “OC” forms (see, e.g., Baxter & Sagart 2014: 188). Again this situation closely parallels the voicing alternants of Huang (2001a).
- *Source 4* (loans): bi<sup>6</sup>ɗ<sup>5</sup> 味道 ‘flavor’ (MC *d-* B2) and su<sup>3</sup>dzai<sup>5</sup> 所在 ‘place’ (MC *dz-* B2) are from a koine like Baxter’s (2014). The onset b- in ‘flavor’ shows Northern denasalization of m- (see Baxter 2014: 67–68; Akitani 2008: 71 supposes this to reflect earlier v- > SB b-). Cognates of the second word are widespread for ‘place’ in Mǐn, but this item features a literary-looking grammatical device (nominalizing MC *ʃjo<sup>B</sup>* 所 + ‘be at’); Mǐn verbs ‘be at’ do not so closely resemble (and are perhaps not even cognate to) MC *dzoj<sup>B</sup>* 在 (e.g., Southern Mǐn [Taiwanese Hokkien] ti<sup>C2</sup>, and see various forms at Akitani 2008: 353–354 including NM Zhènqián [ti<sup>52</sup>] and Eastern Mǐn Zhōuníng 周寧 [ti<sup>3</sup>]).

Akitani’s (2008) SB glossary includes three voiced-onset historical B2/D2 items not mentioned above: the antonyms gəu<sup>5</sup> 厚 ‘thick (of surfaces)’ (MC *ɣ-* B2 : SB *g-* 5 < “B2+”) and bɔ<sup>2</sup> 薄 ‘thin (of surfaces)’ (MC *b-* D2 : SB *b-* 2 < “D2+”), and also the verb fie<sup>2</sup> 食 ‘eat’ (MC *ʒ-* D2 : SB *fi-* 2 < “D2+”). On the view that all such words should be explicable in terms of the sources of § 2, we might claim (for instance) that these involve early NM voicing alternations or koine loans: JY reflections of ‘thick’ are very irregular in Yue (2013), and see § 4 below on ‘eat’.<sup>30</sup> I do not pursue such arguments here, however. The essential point is simply the small size of voiced-onset B2/C2/D2 residual in colloquial NM vocabulary.

Norman’s (1996) Zhènqián material, though a bit problematic in consisting of isolated morphosyllables, serves as a useful point of comparison here. Of specific

30. Yue (2013: 126) reports JY eu<sup>5</sup>, yeu<sup>5</sup>, keu<sup>9</sup>, and heu<sup>9</sup> from various locales and informants, and an anonymous reviewer remarks that comparable variation affects many NM words. A key question for future exploration will be to what extent such variation can be understood in terms of the ideas of Huang (2001a) considered in § 2.3 and § 4.

relevance are the author's historical oblique tone examples of "Series Six Initials" (i.e., pMǐn "softened" \*-D- > PNM \*D-, though recall that ZQ reflections of PNM voicing are purely tonal.) Norman (1996: 36–38) records 37 such items, reported to be all that appear in his ZQ corpus (1996: 24). It is clear, first of all, that Sources 1/2/3 of § 2 above can account for a substantial portion of this relatively small number of words (note some items have already appeared above): (*Tone B*) ion<sup>5</sup> 上 'ascend' is a product of NM voicing alternation (§ 2.3 and just above); kau<sup>5</sup> 咬 'bite' is not the same etymon as other Sinitic 'bite' (cf. MC *ŋæw<sup>B</sup>*) but a Mǐn-specific word with possible connections to Tai (Schuessler 2007: 560); ty<sup>5</sup> 鯉 'carp' had a complex onset in ≈pMǐn and is shared with Tai and/or HM (§ 2.1); to<sup>5</sup> 'far' is an NM-specific word; heŋ<sup>5</sup> 'gizzard' is a Mǐn-specific word (§ 2.2); tyen<sup>5</sup> 懶 'lazy' is a pMǐn/general southern complex-onset word (§ 2.1); tu<sup>5</sup> 苧 'ramie' is a pMǐn/general southern prenasalized word (above); kye<sup>5</sup> 倚 'stand' is a southern Sinitic word whose status in the family as a whole is unclear; -mu<sup>5</sup> 婦 (in 'daughter-in-law') is a bound second syllable voiced in NM due to assimilation (§ 2.4, where compare 'man'); (*Tone C*) tsai<sup>9</sup> 'many' is a Mǐn-specific word; tu<sup>9</sup> 脰 'neck' is a Mǐn-specific and perhaps an old complex onset word (§ 3.1); tio<sup>9</sup> 'road' is a Mǐn-specific word; pi<sup>9</sup> 鼻 'smell' is a product of PNM or earlier voicing alternation (§ 3.1); tion<sup>9</sup> 'surplus' is according to Norman (1996: 37) a Mǐn-specific word; (*Tone D*) tsua<sup>5</sup> 'cockroach' is a Mǐn or more general southern word and apparently from a complex onset (Zhengzhang 2002: 24; Baxter & Sagart 2014: 89); tsi<sup>5</sup> 'one' is an NM-specific or broader Mǐn word; and lye<sup>5</sup> 舌 'tongue' comes from a pMǐn complex onset like those retained in Hmong (above).

In addition, some of Norman's (1996) twenty remaining ZQ examples are doubtful as representatives of native Mǐn – that is, they are likely Source 4 loans. The morpheme ti<sup>5</sup> 值 'to be worth, etc.' in late disyllables like 'value' (cf. Norman 1969 JY ka<sup>5</sup>loi<sup>8</sup> 價值) must be a koine entrant (§ 2.4); Norman's pue<sup>5</sup> 'recite from memory' should be compared to MC *bwoj<sup>C</sup>* 背, not to *bwoj<sup>B</sup>* 倍; and the vocalism of pu<sup>9</sup> 步 'step, pace' (MC *bu<sup>C</sup>*: JY vo<sup>6</sup>: SB bu<sup>6</sup>) contrasts with, e.g., native-looking 'cloth' (MC *pu<sup>C</sup>* 布: JY pio<sup>5</sup>: SB pio<sup>5</sup>). There are peculiarities of other kinds: for 'sweat' (MC *yan<sup>C</sup>* 汗), Akitani's (2008: 117) SB guaiŋ<sup>6</sup> supports PNM voicing, but Norman (1969: 91, 298) has JY kuen<sup>6</sup>: Jiànǒu kuen<sup>6</sup> and thus pMǐn \*-g-, not "softened" \*-g-, at Norman (1973: 228).

Nevertheless, I do not wish to claim that Source 1/2/3/4 origins are obvious in all cases of apparent PNM lower register oblique-tone voicing. A reviewer of this paper holds that most NM data point to voiced 'sweat', for instance, and in addition to 'thick', 'thin', and 'eat' mentioned above, there are items like 'county' (MC *ywen<sup>C</sup>* 縣: SB gyin<sup>6</sup>). Instead, I would again emphasize the scarcity of exam-

ples of PNM oblique-tone \*D- that do not turn out to relate to the sources of § 2. Introducing pMǐn \*-D- on this basis is difficult to justify: in the end, such a category will likely just capture a small number of early complex onset regionalisms (e.g., Norman's \*-d- items when they participate in MC l- : Coastal Mǐn t-, noted above.) For NM specifically, B2/C2/D2 D- consists of a mirror image of the historical upper register situation (Sources 1–3, giving \*D- at or around PNM) plus late voiced-onset loans (Source 4; these are slightly later entrants which may often have directly joined daughter NM branches.) Devoicing of pMǐn \*D- to PNM \*T- is best seen as a regular development in historical B2/C2/D2.

### 3.3 Tone A2 D- in Shǐbēi

Applied to SB, Norman's proposals suggest that MC Tone A2 voiced obstruent onsets D- should correspond to both SB D- Tone 2 (< PNM Tone A2+) and to T-Tone 5 (< A2-). However, in contrast to the situation in B2, C2 and D2 above, as far as historical *voiced stop* onsets are concerned, it is the correspondence MC D- A2 : SB D- 2 which is the rule in Akitani's (2008) glossary:

(MC b-) tuai<sup>6</sup>bɔ<sup>2</sup> 大婆 'great-grandmother' | tɕiaŋ<sup>5</sup>bɔŋ<sup>2</sup>kaiŋ<sup>1</sup> 正房間 'central building' | xo<sup>3</sup>bueiŋ<sup>2</sup> 火盆 'fire bowl (for warmth)' | niu<sup>5</sup>tʰo<sup>3</sup>by<sup>2</sup> 牛腿瓠 'bottle gourd' | (d-) daiŋ<sup>2</sup>te<sup>0</sup> 亭仔 'pavilion' | dɔ<sup>2</sup>po<sup>5</sup> 駝背 'hunchback' | xo<sup>1</sup>dɔ<sup>2</sup> 核桃 'walnut' | dɔŋ<sup>2</sup>tɕʰiŋ<sup>5</sup> 堂前 'front room' | [MC Tone C!] dueiŋ<sup>2</sup> 鈍 'dull' | (g-) ka<sup>6</sup>gi<sup>2</sup> ~ xa<sup>6</sup>gi<sup>2</sup> 下棋 'play chess' | gy<sup>2</sup>neiŋ<sup>5</sup> 渠人 'they' | lɔŋ<sup>5</sup>fi<sup>2</sup> 萁萁 'bracken' | (ɣ-) geiŋ<sup>2</sup> 鹹 'salty' | gəu<sup>2</sup>te<sup>0</sup> 猴仔 'monkey' | gian<sup>2</sup> 行 'from' | gu<sup>2</sup>te<sup>0</sup> 糊仔 'starch paste' | guaiŋ<sup>2</sup>neiŋ<sup>5</sup> 寒人 'cold (of weather)' | fu<sup>2</sup>li<sup>2</sup>ciu<sup>3</sup> 狐狸手 'fourth finger' | fu<sup>2</sup>ɕy<sup>1</sup> 鬚鬚 'beard, mustache' | fu<sup>2</sup>lian<sup>2</sup> 喉嚨 'throat'

This does not mean that the above are a purely native class in SB. 'Walnut' (see Footnote 28), 'hunchback', and 'great-grandmother' have late features, for instance, with SB -ɔ in the latter two items corresponding to MC -a.<sup>31</sup> Also, SB fi-2 is in many cases a reflection of a northern ɣ- A2 (< OC \*g-) rather than a native result. There could also be Source 1–3 words hiding here (e.g., the third-person pronoun 'they' above is southern.) Regardless, in Akitani's (2008) popular glossary and in other colloquial NM data sets, the tendency for cognates of MC Tone A2 words to be voiced is clear. The phenomena of § 2 alone will be inadequate to account for this situation.

31. Akitani (2008:195) does note the thoroughly colloquial applications of bɔ<sup>2</sup> 婆 'old woman' in SB; this morpheme does not appear to go to OC and is of somewhat mysterious provenance. Huang Chin-wen (2001b: § 3) has considered its complex reflections in Jiàn'ōu.

It is significant that Norman's anticipated voiceless correspondents in SB 5 are hard to find where historical A2 voiced stops are concerned. That is, stated more generally, Norman's proposals imply that NM stop-onset words exhibiting the correspondence MC *D-* A2 : NM *T-* A2- should constitute a roughly equivalent class to those exhibiting MC *D-* A2 : NM *D-* A2+, but they do not. This problem looks most serious as regards MC *b-* A2 : SB *p-* 5 and MC *d-* A2 : SB *t-* 5, with (MC *d-*) *tiau*<sup>5</sup> 條 '(classifier for cows, blocks of ink, etc.)' apparently the only example occurring in Akitani's (2008) glossary. Since Akitani (2008: 195) also reports an SB *hjaŋ*<sup>2</sup> *diau*<sup>2</sup> 桁條 'beam', the classifier might be a late entrant. It is possible to find a few morphemes exhibiting these two correspondences elsewhere in Akitani's (2008) extensive NM data.<sup>32</sup> They are a distinct minority, however, and in my view there is little basis for suggesting dual NM analogues of MC *b-* and *d-* in historical A2. Instead, pMǐn \*b/\*d- A2 > SB b/d- 2 should be regarded as regular developments.

The case of gutturals requires special attention (see under MC *g-* and *ɣ-* in the list above). We do find six voiceless-onset SB Tone 5 cognates of MC *g/ɣ-* A2 morphemes in Akitani's (2008) glossary: *kio*<sup>5</sup>te<sup>0</sup> 茄仔 'eggplant', *hy*<sup>2</sup>seŋ<sup>1</sup>*kueiŋ*<sup>5</sup> 圍身裙 'apron', *tsʰai*<sup>1</sup>*kyiŋ*<sup>5</sup> 猜拳 'morra (hand game)', *xuaŋ*<sup>5</sup>ɕioŋ<sup>1</sup>laiŋ<sup>1</sup> 橫廂間 'side buildings (in courtyard)', *xiŋ*<sup>5</sup>tsʰeiŋ<sup>1</sup> 還親 'get married (of a woman)' and *ʔo*<sup>5</sup>xəŋ<sup>5</sup> 禾槁 'winnowing bucket'. However, it is concerning that here we find SB *k-* (first three words) vs. *x-* (next two words) to mirror the extra-Mǐn separation (e.g., MC *g-* vs. *ɣ-* > northern /k/ vs. /x/.<sup>33</sup> More specifically, 'eggplant' is "a relatively late loan word in the Min dialects" (Norman 1981: 48), 'apron' features the late correspondence MC *hj-* : SB *fi-* in its first syllable (see at Footnote 23), the first syllable of 'side buildings' (MC *ɣwæŋ*<sup>A</sup> 橫 'horizontal') may have a native cognate in SB □ *guan*<sup>2</sup> 'horizontal elements of tables and chairs' (Akitani's (2008: 113) gloss is *zhuōyǐ de héngtiáo* 桌椅的橫條), and the SB rime -iŋ corresponding to MC -wæn in 'return' (see 'get married') is anomalous, apparently the only example of its kind in Akitani's

32. For example, Akitani's (2008: 96–120) fuller listing of SB morphosyllables includes items like *pa*<sup>5</sup> 爬, *po*<sup>5</sup> 賠, *pian*<sup>5</sup> 平 (cf. Table 4 and Footnote 38), *taiŋ*<sup>5</sup> 填, *təŋ*<sup>5</sup> 筒 (but also *dəŋ*<sup>2</sup>), and *kian*<sup>5</sup> 擎 'lift with hand'; cf. just below regarding gutturals.

33. By contrast, in the list above, note MC *ɣ-* : SB *g-* (and perhaps significantly, 9 of 14 such examples at Akitani (2008: 82) are in the level tone.) I do not take up the question of SB *g-* vs. *fi-* here. Late loans with *g-* and *ɣ-* do enter the former vs. the latter categories, but the distinction itself appears to have internal origins: see Ting (1999), Huang (2001a), and Tables 1–3 above. As for 'bracken', I find no other examples of MC *g-* : SB *fi-* in the whole of Akitani (2008), suggesting an NM-internal lenition /g/ → /fi/ / ɲ\_V in this case.

material (see, e.g., 2008: 88).<sup>34</sup> Some of these six words, and more generally much of the small class of stop-onset morphemes exhibiting MC *D-* A2 : NM *T-* A2-, must have entered from late, devoiced Sinitic varieties, perhaps including other Mǐn – the last an idea already pursued by Huang (2001a, 2001b).

The bigger picture regarding gutturals is arguably more significant. Among Akitani's (2008: 81) examples of SB *fi-* and *x-* cognates of MC *ɣ-* morphemes, the tendency for *fi-* to belong to the level tone (20 of 29 cases) and *x-* to oblique tones (28 of 34 cases, with the two *x-* syllables just above among the minority examples) is unmistakable.<sup>35</sup> All of these facts suggest that pMǐn voiced stops in A2 generally proceeded to SB Tone 2 *b/d/g-* (and at times *fi-*). This is again just as Huang (2001a) has proposed, but here I take the specific position that this voicing preservation characterizes only the level tone. In § 3.4 below, I show first that Norman's (1969) original JY data is also readily understood in terms of conservatively voiced stops in A2, and then outline a new view of NM onset voicing based on examination of a fuller range of A2 onsets across SB, JY, and other NM.

### 3.4 The Jiànyáng historical lower register in Norman (1969) and a new NM model

In § 3.3 it was seen that the voiced stop onset words found in SB Tone 2 are not entirely from pMǐn A2 but include a few later A2 loans, mixture which becomes more pronounced as the literary lexicon is incorporated. By contrast, in JY, as was noted in § 2.5 by reference to Hirata (1988) and Yue (2013), A2 loans are held separate from native items. In particular, focusing for the moment on voiced stops, it is the correspondence MC *D-* A2 : JY *L-* Tone 2 which marks late entrants, while MC *D-* A2 : JY *L-* Tone 9 marks the native class. Norman's (1969) JY glossary turns out to include large numbers of learned/literary items with *L-* (: MC *D-*), and it proves possible to break words featuring historical voiced stops into two similarly-sized groups beginning from this A2 separation. The first group consists of words exhibiting the correspondences MC *D-* A2 : JY *L-* 2 and MC *D-* B2/ C2/D2 : JY *L-* 5/6/8: this is an internally coherent stratum of voiced stop onset loans from a koine like Baxter's (2014), with such items overwhelming the small quantity of native PNM \**D-* (> JY *L-*) words from Sources 1/2/3 visible in studies

34. SB *xin*<sup>5</sup> 'return' resembles Southern Mǐn (Taiwanese Hokkien) *hiŋ*<sup>2</sup> 'return (coll.)'; I am not sure if this is significant.

35. Also compare Ting's (1999: 250) examples of MC *ɣ-* morphemes with SB *fi-*, all but one in the level tone, and of MC *ɣ-* morphemes with SB *x-*, all but one in oblique tones. Actually it is clear from Akitani's (2008) material that such separations affect both native and loaned material in SB, but this phenomenon is beyond scope here.

like Akitani (2008). The second group consists of words exhibiting the correspondences MC *D-* A2 : JY L- 9 and MC *D-* B2/C2/D2 : JY T- 5/6/8: this is an internally coherent stratum of native Mǐn vocabulary showing conservative voicing in historical A2 words alone. In Table 8, I present these two strata in terms of all of Norman’s (1969) examples with MC *b-* and *d-* (phonological representations and Chinese spellings are maintained from that source.)<sup>36</sup>

**Table 8.** Inherited vs. borrowed reflections of historical *b-* and *d-* onset words in Jiànyáng

MC	JY	2 (< A2-)	5 (< B2)	6 (< C2)	8 (< D2)
<i>b-</i>	koine	vaiŋ <sup>2</sup> iu <sup>3</sup> 朋友 'friend', vau <sup>2</sup> tsie <sup>3</sup> 袍仔 'coat, jacket', voij <sup>2</sup> ueŋ <sup>1</sup> 平安 'safe, peaceful', xuo <sup>2</sup> voij <sup>2</sup> 和平 'peace', vu <sup>2</sup> sai <sup>7</sup> 菩 薩 Bodhisattva, vui <sup>2</sup> ioŋ <sup>3</sup> 培養 'to cultivate (talent)'		vui <sup>6</sup> xu <sup>8</sup> 佩服 'to respect', y <sup>6</sup> voi <sup>6</sup> 預備 'to prepare'	
	inherited	9 (< A2+) ma <sup>8</sup> vai <sup>9</sup> 口牌 'to play cards', mu <sup>8</sup> vai <sup>9</sup> 木排 'raft', pa <sup>8</sup> vaiŋ <sup>9</sup> 白 礬 'alum', vaiŋ <sup>9</sup> 瓶 'bottle, vase', voŋ <sup>9</sup> 馮 'surname', k <sup>h</sup> au <sup>1</sup> vyn <sup>9</sup> 戥盆 'a basin for washing the feet'	poi <sup>5</sup> tsie <sup>3</sup> 婢仔 'a bondswoman'	paiŋ <sup>6</sup> 辦 'to manage, to arrange; to punish', paiŋ <sup>6</sup> xua <sup>7</sup> 辦法 'method, way of handling a matter', paŋ <sup>6</sup> 病 'sick', t <sup>h</sup> u <sup>7</sup> paŋ <sup>6</sup> 口病 'to examine (a sick person)' +1, pyŋ <sup>6</sup> 飯 'cooked rice' +2	ai <sup>9</sup> pa <sup>8</sup> 鞋拔 'shoehorn', pa <sup>8</sup> 白 'white', pa <sup>8</sup> vaiŋ <sup>9</sup> 白礬 'alum', pai <sup>8</sup> 拔 'to pull out', pai <sup>8</sup> nia <sup>8</sup> 拔口 'to tow (a boat)' pu <sup>8</sup> 縛 'to bind'
<i>d-</i>	koine	2 (< A2-)	5 (< B2)	6 (< C2)	8 (< D2)
		lai <sup>2</sup> yeŋ <sup>1</sup> 台灣 'Taiwan', lan <sup>2</sup> 潭 'pool' +1, hu <sup>5</sup> lan <sup>2</sup> 吐痰 'to spit',	lau <sup>5</sup> loi <sup>3</sup> 道理 'reason', lau <sup>5</sup> te <sup>7</sup> 道德 'morality', loi <sup>5</sup> 第 'prefix for	lai <sup>6</sup> hai <sup>5</sup> 代替 'to substitute', lau <sup>6</sup> 稻 'rice plant', voi <sup>6</sup> lau <sup>6</sup> 味道 'flavor', hu <sup>3</sup> loi <sup>6</sup> p <sup>h</sup> u <sup>2</sup> 土	le <sup>8</sup> pie <sup>8</sup> 特別 'special'

36. I try to cover all example morphemes from Norman’s glossary, but use +1, +2, and so forth, to indicate that there are one, two, etc., additional words containing the same morpheme in his data. Gutterals seem to behave more erratically in JY, but a reliable feature is native MC *y-* A2 : JY Ø- 9 (see ‘shoe’) vs. loaned MC *y-* A2 : JY x- 2 (also JY x- in 5/6/8).

Table 8. (continued)

MC	JY	2 (< A2-)	5 (< B2)	6 (< C2)	8 (< D2)
		lo <sup>2</sup> kaŋ <sup>1</sup> 調羹 ‘spoon’, lo <sup>2</sup> 堤 ‘a dike’, lo <sup>6</sup> lu <sup>2</sup> 地圖 ‘map’ +1, loŋ <sup>2</sup> 唐 ‘a surname’, xu <sup>2</sup> lu <sup>2</sup> 糊塗 ‘muddled, mixed-up’, luŋ <sup>2</sup> xa <sup>8</sup> 同學 ‘classmate’, iu <sup>3</sup> xuo <sup>5</sup> luŋ <sup>2</sup> toŋ <sup>1</sup> 有禍同當 ‘to face misfortune together’	forming ordinal numbers’, luŋ <sup>5</sup> 動 ‘to move’	地婆 ‘Earth Goddess’, loi <sup>6</sup> xuoŋ <sup>1</sup> 地方 ‘place’, loi <sup>6</sup> lu <sup>2</sup> 地圖 ‘map’ +3, pio <sup>3</sup> loi <sup>6</sup> 表弟 ‘younger male cousin of a different surname’, tse <sup>3</sup> luen <sup>6</sup> 子彈 ‘bullet’, ken <sup>1</sup> lui <sup>6</sup> 軍隊 ‘army, troops’	
	inherited	9 (< A2+) laiŋ <sup>9</sup> tsie <sup>3</sup> 亭仔 ‘pavilion’, lan <sup>9</sup> 甜 ‘sweet’, lau <sup>9</sup> 淘 ‘to wash (especially rice)’, xui <sup>8</sup> lau <sup>9</sup> 核桃 ‘walnut’, leu <sup>9</sup> 掏 ‘to fish out’, leu <sup>9</sup> tsie <sup>3</sup> 投仔 ‘dice’, leu <sup>9</sup> xan <sup>2</sup> 投降 ‘to surrender’, lo <sup>9</sup> 舵 ‘rudder’, loi <sup>2</sup> loŋ <sup>9</sup> 池塘 ‘a pond’, pai <sup>5</sup> loŋ <sup>9</sup> 拜堂 ‘to bow in the hall – to get married’, lu <sup>9</sup> 杜 ‘surname’, lu <sup>9</sup> 塗 ‘to smear’, luŋ <sup>9</sup> sin <sup>1</sup> 童身 ‘person called upon to dance at a shamanistic rite’ +1	khy <sup>3</sup> tu <sup>5</sup> 豕肚 ‘tripe’ +1, sai <sup>5</sup> ti <sup>5</sup> 細弟 ‘younger brother’ +3, tie <sup>5</sup> soiŋ <sup>1</sup> mu <sup>2</sup> 弟 新口 ‘wife of younger brother’ +1, seu <sup>5</sup> tia <sup>5</sup> 掃地 ‘to sweep the floor’, tia <sup>5</sup> ha <sup>5</sup> 地下 ‘ground, floor’ +3, tuen <sup>5</sup> si <sup>5</sup> 但是 ‘but, however’	i <sup>7</sup> tian <sup>6</sup> 一定 ‘surely’, ua <sup>6</sup> tian <sup>6</sup> 話定 ‘to decide, to agree’ +2, teu <sup>6</sup> 豆 ‘bean’, uoŋ <sup>2</sup> teu <sup>6</sup> 黃豆 ‘soybean’, teu <sup>6</sup> xu <sup>6</sup> 豆腐 ‘beancurd’ +1, t <sup>h</sup> aiŋ <sup>2</sup> tie <sup>6</sup> 田地 ‘fields’, tu <sup>6</sup> tsie <sup>3</sup> 渡仔 ‘ferry boat’, tue <sup>6</sup> 大 ‘big, great; greatly’	ta <sup>8</sup> tsie <sup>3</sup> 碟仔 ‘dish’

This single sort on onset correspondences yields very coherent classes. Note the possibility of cross-reference within disyllables: both onsets of loi<sup>6</sup>lu<sup>2</sup> 地圖 ‘map’

correspond to MC *d*-; as this is a unitary word, in itself it serves as a marker of the historical unity of JY l- in Tone 2 and in Tone 6 (see row 3 koine). In the same way, both syllable onsets of **pa<sup>8</sup>vaiŋ<sup>9</sup>** 白礬 ‘alum’ correspond to MC *b*-, pointing to the historical unity of JY v- in Tone 9 and p- in Tone 8 (see row 2 inherited). Consider also native vs. koine doublets: devoiced tia<sup>5</sup> ‘ground’ occurs in colloquial seu<sup>5</sup>tia<sup>5</sup> 掃地 ‘sweep the floor’, tia<sup>5</sup>ha<sup>5</sup> 地下 ‘ground, floor’, etc., whereas loi<sup>6</sup> occurs within younger regional standard vocabulary like loi<sup>6</sup>xuoŋ<sup>1</sup> 地方 ‘place’ (with Late MC *f*- [< *p*-] : JY x-), loi<sup>6</sup>lu<sup>2</sup> 地圖 ‘map’, etc. Likewise, ‘younger brother’ is devoiced in colloquial sai<sup>5</sup>ti<sup>5</sup> 細弟 ‘younger brother’, tie<sup>5</sup>soiŋ<sup>1</sup>mu<sup>2</sup> 弟新口 ‘wife of younger brother’, etc., whereas loi<sup>6</sup> occurs in learned pio<sup>3</sup>loi<sup>6</sup> 表弟 ‘younger male cousin of a different surname’, etc.<sup>37</sup> Many late koine disyllables carry additional distinguishing phonological features: xuo<sup>2</sup>voin<sup>2</sup> 和平 ‘peace’ (MC *ɣ*- A2 : JY x- 2), vui<sup>6</sup>xu<sup>8</sup> 佩服 ‘to respect’ (Late MC *β*- [< *b*-] : JY x-), voi<sup>6</sup>lau<sup>6</sup> 味道 ‘flavor’ (Late MC *v*- [< *m*-] : JY v- and compare SB in § 3.2), etc.

Two kinds of intrusive material are underlined in the Table 8 inherited stratum. First, while Tone 9 is largely a native category in JY, a few loans do appear in which this tone is not a result of pMǐn \*b/\*d- A2 but rather must reflect initial stress in koine disyllables (xui<sup>8</sup>lau<sup>9</sup> 核桃 ‘walnut’ and loi<sup>2</sup>loŋ<sup>9</sup> 池塘 ‘a pond’; cf. ha<sup>5</sup>va<sup>9</sup> 下巴 ‘cheek’ and others in Norman 1969 in which lenition plus JY Tone 9 is clearly late-arising in loaned material.) Second, in the oblique tones, a few items appear which are loans from a relatively recent devoiced transregional standard or other Mǐn, including pain<sup>6</sup>xua<sup>7</sup> 辦法 ‘method, way of handling a matter’, teu<sup>6</sup>xu<sup>6</sup> 豆腐 ‘beancurd’, and perhaps also i<sup>7</sup>tian<sup>6</sup> 一定 ‘surely’ and tuen<sup>5</sup>si<sup>5</sup> 但是 ‘but, however’. Significantly, these words are of a piece with the small body of devoiced NM words with MC A2 voiced stop onset cognates, discussed in § 3.3 above. That is, in Table 8, we may be seeing the oblique-tone portion of an additional, small correspondence class MC *D*- A2/B2/C2/D2 : JY T- 2/5/6/8 which consists largely of late loans (cf. discussion of sonorants, etc., later in this Section.) In the JY case, much as was seen in SB, MC *d*- A2 : JY t- 2 in Norman (1969) turns out to consist only of tai<sup>2</sup>tsie<sup>3</sup> 蹄仔 ‘pork shoulder’ and, again, tio<sup>2</sup> 條 ‘Measure for rivers’.<sup>38</sup> Observe finally that Norman’s (1969) glossary contains extremely few

37. I disregard the difference ti<sup>5</sup> ~ tie<sup>5</sup> for ‘younger brother’; it could of course itself be due to stratification. Also, an anonymous reviewer points out that mu<sup>2</sup> in ‘wife of younger brother’ should be represented “婦” (cf. § 2.4), but for clarity I retain Norman’s representations; see discussion in § 2.4 above.

38. For MC *b*- A2 : JY p- 5, Norman’s (1969) JY pu<sup>2</sup> ~ p<sup>h</sup>u<sup>2</sup> 婆 ‘old woman’ and pian<sup>2</sup> 平 ‘flat’ deserve attention. The former may be rather young in Sinitic (see § 3.3 and Footnote 31 above as well as discussion in Huang (2001b)); the latter appears in Table 4 and Footnote 32 above.



PNM oblique-tone \*D- (i.e., Source 1/2/3) items akin to ‘neck,’ ‘ramie,’ etc., above. The one likely case in Table 8 is underlined lau<sup>6</sup> 稻 ‘rice plant,’ often compared to HM (Ratliff 2010 pHM \*mbləu; cf. ‘tongue’ in § 3.2).

In the remainder of § 3.4, I propose to leverage Table 8, and specifically the separate native vs. loaned correspondences revealed by JY (e.g., JY L- 9 : SB D- 2 vs. JY L- 2 : SB D- 2), to build a tentative general proposal for a conditioned split of Tone A2 in NM. I try to examine the subgroup more broadly by reference to both Norman’s (1969) JY and to a fuller range of Akitani’s (2008) SB, ZQ and Dǐkǒu (DK) 迪口 data. Whereas Akitani’s (2008) glossaries prove heavily native (see § 3.1–§ 3.3), this expanded view encompasses much extrinsic material akin to that of Table 8’s koine rows.

The key outstanding issues are NM sonorant and what I will call “affricate” onsets, below N- and DZ-. As regards first sonorants, the data at hand reveal a basic correspondence JY 2 : SB 5 : ZQ 2 : DK 2. Here we see consistent indication of PNM A2- across the subgroup; thus, the native development was pMǐn \*N- A2 > PNM \*N- A2-. Examples may be found within Akitani’s (2008) various lists of historical A2 morphemes in NM (pages 92–93 for SB, page 139 for ZQ, and page 186 for DK). Below I provide reduced diagnostic native pairs of the form SB Tone 5 : ZQ Tone 2 (my English glosses are simply based on general Sinitic and may be inapt for NM.)

(MC l-) li<sup>5</sup>: li<sup>2</sup> 梨 ‘pear’ | liŋ<sup>5</sup>: liŋ<sup>2</sup> 簾 ‘screen’ | lueiŋ<sup>5</sup>: leuŋ<sup>2</sup> 龍 ‘dragon’ | luaiŋ<sup>5</sup>: luaiŋ<sup>2</sup> 欄 ‘railing’ | (n-) nai<sup>5</sup>: nai<sup>2</sup> 泥 ‘mud’ | (ń-) neiŋ<sup>5</sup>: neiŋ<sup>2</sup> 人 ‘person’ | (ŋ-) nueiŋ<sup>5</sup>: neuŋ<sup>2</sup> 濃 ‘thick (of odor, etc.)’ | (ŋ-) niu<sup>5</sup>: niu<sup>2</sup> 牛 ‘bull’ | ŋɔ<sup>5</sup>: ŋye<sup>2</sup> 鵝 ‘goose’ | ŋa<sup>5</sup>: ŋa<sup>2</sup> 牙 ‘tooth’ | ŋy<sup>5</sup>: ŋy<sup>2</sup> 魚 ‘fish’ | (y-) ʔian<sup>5</sup>: ian<sup>2</sup> 贏 ‘win’ | ʔiŋ<sup>5</sup>: ʔoŋ<sup>2</sup> 羊 ‘sheep’ | ʔiu<sup>5</sup>: iu<sup>2</sup> 油 ‘oil’

Occasional sonorant-onset items for which individual NM reflexes seem to point instead to PNM A2+ (SB 2, JY 9, etc.) are stress loss effects in daughter varieties. For instance, Akitani (2008: 92–93) reports that pMǐn \*N- A2 items appearing in SB 2 (as opposed to 5) involve non-initial syllables of polysyllabic words. In JY 9, comparably anomalous items in Norman (1969) include mau<sup>9</sup> 無 ‘not have,’ noi<sup>9</sup> 你 ‘you,’ ŋue<sup>9</sup> 我 ‘I, me,’ etc., with various historical tonal categories represented. This exceptional behavior is of much interest in that it provides clear indication that a small portion of SB 2, JY 9, etc., is prosodic in origin.

There is also the regular-looking sonorant correspondence JY 2 : SB 5 : ZQ 9 : DK 9. Rather than a proto-segment contrasting with regular PNM \*N-, here it is necessary to appeal to late entry into differentiated NM languages (thus I think there is a clear analogy to the situation regarding stops which the softening theory has trouble with.) The loaning solution is strongly supported by semantics and distribution. Examples in the reduced diagnostic form SB 5 : ZQ 9 are

below, again extracted from Akitani's (2008) lists; parentheses in glosses mark use in disyllabic words.

(MC *m-*) *məu*<sup>5</sup> : *meu*<sup>9</sup> 謀 '(plot, etc.)' | *məŋ*<sup>5</sup> : *mauŋ*<sup>9</sup> 忙 'busy' | (*l-*) *li*<sup>5</sup> : *li*<sup>9</sup> 厘 '(centimeter, etc.)' | *liŋ*<sup>5</sup> : *liŋ*<sup>9</sup> 廉 '(inexpensive, etc.)' | *liu*<sup>5</sup> : *liu*<sup>9</sup> 劉 '[surname]' | *lueiŋ*<sup>5</sup> : *leuŋ*<sup>9</sup> 隆 '(prosperous, etc.)' | *luaiŋ*<sup>5</sup> : *luaiŋ*<sup>9</sup> 鸞 '[name of mythical bird]' | (*ŋ-*) *neiŋ*<sup>5</sup> : *iŋ*<sup>9</sup> 仁 '(benevolent, etc.)' | (*ŋ-*) *ŋyiŋ*<sup>5</sup> : *ŋyiŋ*<sup>9</sup> 言 'speak (lit.)' | (*y-*) *?iu*<sup>5</sup> : *iu*<sup>9</sup> 由 'from (lit.)'

Among such words we find the odd example where an NM language does not have a sonorant onset (here see ZQ 'benevolent', an obvious late loan.) This is reminiscent of two further special cases involving sonorants: MC *m-* A2 etyma with NM correspondents in JY *v-* 2 : SB *b-* 2 : ZQ *Ø-* 9 : DK *Ø-* 9, and MC *hj/y/ń-* A2 etyma with NM correspondents in JY *Ø-* 2 : SB *fi-* 2 : ZQ *Ø-* 9 : DK *Ø-* 9 (see Akitani (2008: 92) for SB examples.) For instance, MC *mjun*<sup>A</sup> 文 '(literature, etc.)' is JY *vuŋ*<sup>2</sup> : SB *bueiŋ*<sup>2</sup> : ZQ *uaŋ*<sup>9</sup>; MC *ńen*<sup>A</sup> 然 'thus' is JY *ieŋ*<sup>2</sup> : SB *fiŋ*<sup>2</sup> : ZQ *iŋ*<sup>9</sup>. These are clear late entrants in which labiodentalization or palatalization had advanced to denasalization in the donor. Again, the native A2 sonorant development is to PNM \*N- A2-.

Turning now to pMǐn A2 "affricates", here I use \*DZ- in reference to Mǐn cognates of MC *d-* 澄 and *dz-* 從 morphemes, eliding the question of the specific nature of these onsets at pMǐn. The key correspondence is once again JY 2 : SB 5 : ZQ 2 : DK 2. Thus, the pMǐn onsets at issue proceeded regularly to PNM A2- just as did the sonorants, with devoicing associated with this tonal development in NM proper. It seems that at least in Tone A, the early Mǐn analogue of MC *d-* (> PNM \*t- A2-) was distinct from early Mǐn \*d-, which recall on the present approach is seen to have developed regularly to PNM \*d- A2+. <sup>39</sup> Below are native sets of the form JY 2 : SB 5 : ZQ 2, with JY from Norman (1969) and SB/ZQ again from Akitani (2008: 78, 139); observe devoicing to t- and ts- (~ tɕ-).

(MC *d-*) *ta*<sup>2</sup> : *ta*<sup>5</sup> : *ta*<sup>2</sup> 茶 'tea' | *toŋ*<sup>2</sup> : *tɕŋ*<sup>5</sup> : *tauŋ*<sup>2</sup> 腸 'intestines' | *toiŋ*<sup>2</sup> : *teiŋ*<sup>5</sup> : (DK *teiŋ*<sup>2</sup>) 塵 'dust' | (*dz-*) *tsieŋ*<sup>2</sup> : *tɕieŋ*<sup>5</sup> : *tɕieŋ*<sup>2</sup> 錢 'money' | *tsaŋ*<sup>2</sup> : - : *tsaŋ*<sup>2</sup> 晴 'clear' | *tsioŋ*<sup>2</sup> : *tɕioŋ*<sup>5</sup> : *tɕioŋ*<sup>2</sup> 牆 'wall' | *tsoi*<sup>2</sup> : *tɕi*<sup>5</sup> : *tɕi*<sup>2</sup> 糍 'rice cake' | - : *tsɔ*<sup>5</sup> : *tso*<sup>2</sup> 槽 'trough'

39. Clear native NM cognates of MC *dž-* 禪 and *dz-* 崇 morphemes are fewer and I set these aside. Perhaps the former fit here (e.g., JY *tsie*<sup>2</sup> : SB *tɕie*<sup>5</sup> : ZQ *tɕie*<sup>2</sup> 匙 'spoon'), while the latter follow the dentals (that is, > d- A2 and > t- B2/C2/D2); see Akitani (2008: 80) for SB level tone *dy*<sup>2</sup> 鋤 'hoe' vs. oblique-tone *ti*<sup>6</sup> 事 'work'.

Norman's (1969) suggested examples of pMǐn \*D- A2 > PNM \*T- A2- turn out to be predominantly of this specific kind: JY ta<sup>2</sup> 茶 'tea', toij<sup>2</sup> 陳 '(a surname)', lue<sup>2</sup>toij<sup>2</sup> 拉腸 'to have diarrhea', toij<sup>2</sup> 沈 'to sink', ty<sup>2</sup>tsie<sup>3</sup> 廚仔 'cook', xui<sup>1</sup>toij<sup>2</sup> 灰塵 'dust', etc.

There is also the regular-looking "affricate" correspondence JY l- 2 : SB d/dz- 2 : ZQ t/ts- 9 : DK t/ts- 9. These are once again late entrants, with JY l- Tone 2 crucial to the determination (cf. Table 8). Illustrative pairs from Norman (1969) and Akitani (2008) are as follows, consisting of JY example word : ZQ morpheme.

(MC *d-*) ly<sup>2</sup>haŋ<sup>5</sup> 除口 'besides' : ty<sup>9</sup> | loi<sup>2</sup>loŋ<sup>9</sup> 池塘 'a pond' : tie<sup>9</sup> | (dz-) kuen<sup>1</sup>lue<sup>2</sup> 棺材 'coffin' : tsua<sup>9</sup> | lue<sup>2</sup>loi<sup>3</sup> 財禮 'engagement gift' : tsua<sup>9</sup> | lue<sup>2</sup>xuŋ<sup>2</sup> 裁縫 'tailor' : tsoi<sup>9</sup> | lyŋ<sup>2</sup>lai<sup>5</sup> 存在 'to exist' : tsauŋ<sup>9</sup> | leŋ<sup>2</sup>ts'ien<sup>2</sup> 從前 'previously, before' : tseuŋ<sup>9</sup>

There are again also segmental markers: see JY x- in 'tailor', a reflection of northern labiodentalization. I present in Table 9 the specific case of JY cognates of MC *dz-* morphemes in more detail, providing all tonal categories and all relevant examples from Norman's (1969) JY glossary in the manner of Table 8.

**Table 9.** Inherited vs. borrowed reflections of historical *dz-* onset words in Jiànyáng

MC	JY	2 (< A2-)	5 (< B2)	6 (< C2)	8 (< D2)
<i>dz-</i>	koine	leŋ <sup>2</sup> ts'ien <sup>2</sup> 從前 'previously, before', hieŋ <sup>1</sup> lue <sup>2</sup> 天才 'talent', kuen <sup>1</sup> lue <sup>2</sup> 棺材 'coffin', lue <sup>2</sup> loi <sup>3</sup> 財禮 'engagement gift', lue <sup>2</sup> tsy <sup>3</sup> 財主 'rich man', lue <sup>2</sup> xuŋ <sup>2</sup> 裁縫 'tailor', lyŋ <sup>2</sup> lai <sup>5</sup> 存 在 'to exist'	lau <sup>5</sup> xueŋ <sup>3</sup> 造 反 'to revolt', lyŋ <sup>2</sup> lai <sup>5</sup> 存在 'to exist', si <sup>8</sup> lai <sup>5</sup> 實在 'really', xau <sup>3</sup> lai <sup>5</sup> 好在 'fortunately', xieŋ <sup>6</sup> lai <sup>5</sup> 現在 'now'	loi <sup>6</sup> 字 'a Chinese character', loi <sup>6</sup> tieŋ <sup>3</sup> 字典 'dictionary', sia <sup>3</sup> loi <sup>6</sup> 寫字 'to write (characters)', lui <sup>6</sup> 罪 'guilt, crime'	
	inherited	tsaŋ <sup>2</sup> hieŋ <sup>1</sup> 晴天 'a clear day', tsien <sup>2</sup> 錢 'money' +1, tsion <sup>2</sup> 牆 'wall' +1		mu <sup>8</sup> tsion <sup>6</sup> 木 匠 'carpenter', tsiu <sup>6</sup> 就 'then, immediately' +1, tsoi <sup>6</sup> 自 'oneself'	tsoi <sup>8</sup> 疾 'painful', tsue <sup>8</sup> 坐 'to sit', tsie <sup>7</sup> 漬 'to soak, to immerse'

The koine layer here proves to have the same internal consistencies as were seen in Table 8 (note koine A2 + B2 in **lyŋ<sup>2</sup>lai<sup>5</sup>** 存在 ‘to exist’), as well as correspondences like Late MC **β-** : JY **x-**.<sup>40</sup>

In light of the foregoing, I believe the pMín tonal class A2 was affected by devoicing relatively late, with voiced stops especially resistant. In PNM, even as onsets of other kinds were devoiced, A2 stops retained their voicing, and were to yield the new, extra-low tonal class A2+ (see Table 10).

**Table 10.** A conditioned split in early NM Tone A2

Pre-Mín or pMín Tone A2	PNM
voiced aspirates *D <sup>h</sup> - (>> NM T <sup>h</sup> -)	A2–
*ɬ- (i.e., the antecedent of NM s/ɬ- given s/ɬ- : MC l-)	
sonorants *N-	→
voiced “affricates” *d- (?), *dz- (>> NM T-, TS-)	
voiced stops *D-	A2+

In the case of Table 10 “\*D<sup>h</sup>-” and “\*ɬ-”, regular development into PNM A2– is uncontroversial. For this result given pMín onsets \*D<sup>h</sup>- in A2, see Akitani (2008: 54, page 79 for the SB situation). Here I am not concerned with whether such a segment was phonemic at pMín. For A2– as the regular result given items to enter the onset correspondence MC l- : NM s/ɬ-, see Akitani (2008: 54, page 80 for so<sup>5</sup> 雷 ‘thunder’, saiŋ<sup>5</sup> 籃 ‘basket’ and six additional SB examples.) This segment could have been PNM or earlier \*ɬ-, \*C<sup>h</sup>l- or some other(s) (see Mei & Norman 1971), with specifics again inessential here. I also leave aside the more important question of how to understand NM Línjiāng 臨江 and the Shào–Jiāng group, in both of which the sonorants and affricates of Table 10 yield A2+, not A2–. Akitani (2013) sees these as independent reorganizations of the general NM situation (that is, certain A2– words came to enter A2+ and were revoiced attendant to this tonal shift. Note, however, that Akitani does not present the A2 split characterizing most of NM as conditioned, as is proposed here.) My preference would be to approach this situation from the likely allophonic nature of onset voicing in Tone A2 of “Proto Northwestern Mǐn” (PNWM), with devoicing and the associated tonal split preceding differently across daughter branches.

40. There seem to me to be almost no NM cognates of MC **d-** or **dz-** onset morphemes which have consistent PNM A2+-type reflexes across modern NM. One could be JY loŋ<sup>9</sup> : SB dɔŋ<sup>2</sup> : ZQ taŋ<sup>9</sup> 長 ‘long’ (MC **d-**), but this word might participate in an alternation involving attributive vs. predicative applications in SB; see § 4. I also find JY lyen<sup>9</sup> : SB dzyiŋ<sup>2</sup> : ZQ tɕyiŋ<sup>9</sup> 全 ‘(entire)’ (MC **dz-**) in JY words like lyen<sup>9</sup>ka<sup>1</sup> 全家 ‘the whole family’.

The general conclusion here is thus that voicing neutralization D- > T- was far from complete in PNM; at least the voiced stops survived as such in Tone A2. Subsequently, A2 was affected by a secondary tonal split separating \*b/\*d/\*g- (> A2+) from other onsets, among which obstruents had devoiced or were soon to (> A2-). Precisely which moment we consider to constitute “PNM proper” is less important for my purposes, and involves the PNWM question and more specifically the question of the era at which an analysis of A2+/A2- as contrasting tonemes becomes appropriate. The key point is the significance of the retention of voiced stops D- in A2 and later in A2+. This native class provided a foundation for the development pMǐn \*NT- > D- in NM (Source 1 of § 2.1), and allowed accommodation of voiced local words (Source 2), voiced alternants (Source 3), and eventually large numbers of voiced loans (Source 4) in the same D- across tones. The well-known and dramatic A2+ skew in Norman’s data is a product of the special behavior of A2 in NM. By contrast, B2/C2/D2 splits, where they occurred (or remain in progress), followed on the reemergence of D- in these categories.

A few examples above have hinted at a class of exceptions in which NM A2+ or its individual reflexes (JY 9, SB 2, etc.) have prosodic origins. In the concluding thoughts of § 4, I briefly take up a related idea which concerns the status of NM within Mǐn as a whole: the possibility that Source 3 voicing alternants (§ 2.3) ultimately reflect tone shift driven by characteristically Mǐn stress loss.

#### 4. Stress and sandhi: Northern Mǐn as typical Mǐn with a twist

I have presented fuller information from Huang (2001a) and other sources regarding the NM voiceless-onset/voiced-onset alternant pairs of Table 3 (e.g., JY *taŋ*<sup>1</sup> ‘load (n.)’ ~ *laŋ*<sup>9</sup> ‘carry a load’) in an Appendix. As stated in § 2.3, stratification could be the cause of doubling in a few of these or similar cases, and I disregard ‘mushroom’ and ‘lard’ in light of this possibility. However, given the colloquial nature of member items and their peculiar distributions, this will not be a sound general solution. Past attempts to introduce morphology proper are in my view equally doubtful. For instance, Yue’s (1976; 2013) idea of JY Tone 9 in particular as a *biànyīn* 變音 (or “tonal morpheme”) is too narrowly focused, as she does not address the larger NM voiced onsets problem of which JY 9 is only one aspect. Baxter & Sagart’s claims (see esp. 2014: 186–187), on the other hand, are overly broad. As has been noted, projection of the voiced onsets of Table 3 to OC presyllables or prefixes is neither justified by the available evidence nor at all elucidating with respect to the details of the distribution of voicing in NM (cf. criticisms in Akitani 2017). Huang (2001a: 40–41) hews closest to the facts at hand in perceiving a now-obsolescent early NM mechanism. However, her analogy to early Sinitic anticausative – i.e., *de*-transitivizing – voicing is problematic (cf. criti-

cisms at Wáng (2005: 476–477); also Jacques (2015) for a comparative view of the Old Chinese situation), and we would need to attribute a diffuse range of derivational effects to such a hypothetical morphological process.

The uneven nature of the material in question is extremely clear. To point to just two cases among many, one anonymous reviewer of this paper has expressed the view that Huang's (2001a: 305) SB *tsia*<sup>6</sup>*te*<sup>3</sup>*paiŋ*<sup>5</sup> ~ *paiŋ*<sup>1</sup> 'freckles' should really be *tsia*<sup>6</sup>*te*<sup>3</sup>*baiŋ*<sup>5</sup>, and Yue (2013: 90) notes JY *luen*<sup>9</sup>*cin*<sup>1</sup> 單身 'single' vs. *tuen*<sup>1</sup>*ŋaiŋ*<sup>3</sup>*ɣue*<sup>2</sup> 單眼皮 'single eye-lid', etc. Beginning from Huang's (2001a) position that such variability itself may suggest a now-defunct early NM process, we might consider adopting Yue's (1976; 2013) basic view that *tone shift*, not onset alternation, was the driver of these changes. Such an adjustment would allow us to consider some of the doublets at issue to be remnants not of derivational morphology, but rather of stress-driven allomorphy. Specifically, in light of what is seen elsewhere in Mǐn, we may hypothesize that certain PNM and/or early daughter language morphemes had pitch-depressed allomorphs when employed in non-final position within constructions such as Attr. + N, etc. As such, given (1) PNM's unique retention of voiced onsets in Tone A2+ (reconstructed as low [11] in PNM in Handel 2003: 71), and (2) the related possibility that this voicing had acquired the status of allophonic attendant of phonetic low pitch in early NM, it is possible that synchronically, PNM /T/ came to be realized as [D] not only in low A2+ but also in (low) sandhi allomorphs from other citation tones.<sup>41</sup>

I do not attempt a detailed exposition of this idea here. Such an account would include, for instance, examination of the different phonologizations of possible stress/sandhi variants that characterize different NM varieties, with early /A1/ > [A2+] > JY 9 / SB 2, etc., the most clearly attested. Neither is it my view that a sandhi account will prove useful in all cases (the diverse sources of NM voiced onsets have of course been a point of emphasis in this study.) However, I do think that in the Appendix we see a small critical mass of doublet pairs for which other explanations (including Sources 1, 2 and 4 of § 2) are likely to fail. Accordingly, in hopes of stimulating further discussion, I present by way of conclusion what I see as a few key advantages of a sandhi approach.

First, right-dominant tone sandhi (*liándú biàndiào* 連讀變調) is widely attested across Mǐn. These processes are thought to have begun from phonetic pitch depression due to loss of stress on non-final syllables of prosodic units meeting certain syntactic and/or phonological conditions, later proceeding towards

41. So it may not be the case that, as Hirata (1988: 18) argues, "tone sandhi is incapable of accounting for the phenomenon of onset softening" 連讀變調不能解釋聲母弱化現象. Ironically, this objection was in response to Yue (1976), who had not suggested tone sandhi as such to begin with: for the misunderstanding, see Yue (2013: 56).

paradigms within which “citation tone” morphemes map to “sandhi tone” (non-final) allomorphs (see esp. Chen 2000).<sup>42</sup> In Table 11, I present the possibility of an NM-inclusive account of general Mǐn stress/sandhi by reference to MC *tam*<sup>A</sup> 擔 ‘carry on the shoulder’ and *bjij*<sup>C</sup> 鼻 ‘nose’. In the former case, Southern Mǐn lacks the dual analogues ‘carry’ vs. ‘load’ seen in NM; in the latter case, it lacks ‘smell’ vs. ‘nose’ (widespread in Mǐn including NM; see Wāng & Akitani 2014: 701–702). Nonetheless, Southern Mǐn’s sandhi alternations present striking *correlations* with the lexical (including part of speech) contrasts seen in other Mǐn/NM (see Stage 2 in Table 11).<sup>43</sup>

**Table 11.** From stress to sandhi allomorphy in Southern Mǐn

pMǐn lexeme	Stage 1: syntactically conditioned pitch depression	Stage 2 (Taiwanese Hokkien): sandhi allomorphy; no lexicalization
*tam <sup>A1</sup> ‘carry on shoulder’	(X) [tam 55]  [≈tam 31] X	gu <sup>2</sup> > <sup>6</sup> tā <sup>1</sup> 牛擔 ‘yoke’, tɕ <sup>h</sup> iam <sup>1</sup> > <sup>6</sup> tā <sup>1</sup> 攆擔 ‘sharpened pole’  tā <sup>1</sup> > <sup>6</sup> tsui <sup>3</sup> 擔水 ‘carry water’, tā <sup>1</sup> > <sup>6</sup> kang <sup>1</sup> 擔工 ‘porter’
*bi <sup>C2</sup> ‘nose’	(X) [p <sup>h</sup> i 33]  [≈p <sup>h</sup> i 22] X	p <sup>h</sup> i <sup>6</sup> ‘nose’, tsat <sup>8</sup> > <sup>7</sup> p <sup>h</sup> i <sup>6</sup> 實鼻 ‘stuffy nose’  p <sup>h</sup> i <sup>6</sup> > <sup>5</sup> p <sup>h</sup> aj <sup>1</sup> 鼻芳 ‘smell sth. fragrant’, p <sup>h</sup> i <sup>6</sup> > <sup>5</sup> tsui <sup>3</sup> 鼻水 ‘mucus’

That is, reconstruction of syntactically conditioned pitch depression (≈ Stage 1 in Table 11) to pMǐn allows a satisfying descriptive parsimony: on top of combining NM upper register alternants like Huang’s (2001a) ‘carry’ ~ ‘load’ with otherwise aberrant-seeming lower register ‘smell’ ~ ‘nose’, etc., the NM situation is brought together with Mǐn-wide tendencies. The NM particulars would naturally have been affected by the survival of voiced onsets in A2 and then A2+, as shown in Table 12.

42. Both Chen (2000) on Sinitic and Ratliff (1992) on White Hmong regard the origins of sandhi systems as closely related to changes affecting unstressed syllables. White Hmong is left-dominant; see Ratliff (1992: 35–36) and Downer (1967: 592–593) for triggering environments. Closer to Mǐn is right-dominant Biao Mien 標敏, with no phonological trigger and sandhi domains of two or more syllables in length (specifications at Solnit 1985: 184).

43. In Tables 11 and 12 under Stage 1, phonetic tone values are merely illustrative. Under Stage 2 in Table 11, I use forms and definitions from MNYCD (2011), but provide IPA representations, general Sinitic etymological (as opposed to Taiwanese Language Phonetic Alphabet) tone numbers, and rough indication of sandhi changes.

In this way, the intermittent stranding in NM of what were historically allomorphs, giving rise to the modern lexemes on display at right in Table 12 (and the Appendix), could be seen to reflect much the same disintegration of sandhi paradigms found in, e.g., White Hmong (Downer 1967; Ratliff 1992). In such cases, we at times observe phenomena including restoration of citation forms in prototypical sandhi environments, non-preferential employment of sandhi and non-sandhi variants, and also elevation of what were in origin sandhi variants to independent lexical status (Ratliff 1992: 77–88). In NM, loss of sandhi and sporadic lexicalization of variants may have been associated with entry of a koine stratum featuring radically different voicing and stress patterns.

Table 12. From stress to allomorphy to lexicalization in NM

pMin lexeme	Stage 1: pitch depression under PNM bundling of low pitch and +V	Stage 2: sandhi allomorphy > some phonemic breaks	Stage 3 (SB): lexicalization
*tan <sup>A1</sup> ‘carry on shoulder’	(X) [tan 55]  [≈t <sup>h</sup> an 31] X	pin <sup>B1</sup> tan <sup>A1</sup> 扁擔 ‘shoulder pole’  dan <sup>A2+</sup> tan <sup>A1</sup> 擔擔 ‘carry a load’	/tan <sup>1</sup> / ‘load’  /dan <sup>2</sup> / ‘carry’
*bi <sup>C2</sup> ‘nose’	(X) [p <sup>h</sup> i 33]; later > [p <sup>h</sup> i 33]  [≈p <sup>h</sup> i 22] X	p <sup>h</sup> i <sup>C2</sup> 鼻 ‘nose’  bi <sup>C2+</sup> tɕy <sup>B1</sup> 鼻嘴 ‘to kiss’	/p <sup>h</sup> i <sup>6</sup> / ‘nose’  /bi <sup>6</sup> / ‘to smell, etc.’

An additional and in my view substantial benefit to this approach is that reference to historical word- and phrase-level stress/sandhi effects clears up the difficulties of Table 5, where sixteen early NM tones are necessary if an analogy to medieval Sinitic tonal registrogenesis (where four tones > eight) is pursued to its logical conclusion.<sup>44</sup> On the current alternative view, a conditioned PNM or post-PNM split of just A2 yielded nine total tones, with further splits and mergers driven by new voiced items (from entry of old complex onset words, substrate words, the odd lexicalized sandhi allomorph, and late loans) and proceeding slightly differently across daughter languages.

At last, it is significant that the PNM bundling of low pitch and onset voicing proposed above is a recognized feature of certain dialects of this region. Ho (1996: 229–30) describes such an association in Jǐngníng 景寧 Wú of southwest-ern Zhèjiāng, for instance, with particular tonal categories acquiring historically

44. To be precise, at least fourteen, as apparently no NM variety separates “A1+” from “C1+” or “B1+” from “D1+” (cf. Table 5). Such consolidations are natural from the sandhi point of view.



anomalous voiced onsets as they undergo diachronic pitch lowering.<sup>45</sup> Arguably more pertinent (though less specifically described) are Zhengzhang's (1985:42) observations regarding NM Línjiāng and Shuǐběi 水北: he remarks that "the voiced feature [of obstruents] can be regarded as an attendant feature of Tone A2, accounting for voiceless obstruents [p t ts tɕ k] in A2 being pronounced [b d dz dz g]," and indeed sees A2 alone as a voiced-onset category in these varieties, with devoicing having affected oblique tones (1985:43 incl. Footnote 3).<sup>46</sup> This is just the arrangement I have suggested here for general NM. In my opinion, this is another sense in which regional phenomena prove to elucidate the NM situation, allowing us to avoid recourse to awkward stipulations concerning pMǐn or Old Chinese.

There is arguably an elegance in the generality of Norman's proposals for pMǐn softened onsets or for Common Mǐn \*D-, while the phenomena of § 2, though in my view quite clearly established, make for a more complicated picture. However, the possibility that Norman's (1973) pMǐn \*-D- was in large part just A2 \*D-, with its voiced stops preserved in the NM languages of this Wú-Mǐn border region, is both more adequate to deal with the modern situation (as seen in § 3 above) and simple in its own way. The uniquely NM voiced results of § 2, including the sandhi results I have now proposed to account for certain § 2.3 alternations, may be seen as contingent upon this conservative internal class. Actually, Zhengzhang (1995:17) held from the beginning that NM languages had "likely simply retained the voiced onsets native to their varieties given a favorable environment and prolonged the neutralization process."<sup>47</sup> I think this is exactly right as regards Tone A2 in particular, a preservation that may ultimately prove relevant to the special behavior of A2 across Sinitic with respect to devoicing.

45. Ho's (1996) thought experiment on this point concerns whether SB onset voicing *in general* could have resulted from such phenomena, an idea presenting a number of serious difficulties which he duly notes. Also, recall that a similar process is a feature of Akitani's (2013) approach to Línjiāng and Shào-Jiāng.

46. "濁音成分也可視為陽平調的伴隨成分，說明清塞音[p t ts tɕ k] 在陽平調也可讀作[b d dz dz g]." The Línjiāng and Shuǐběi situations merit further study by reference especially to Akitani (2013).

47. As opposed to having borrowed from, e.g., Wú: "它們可能只是在有利的環境中保存了本方言原有的濁母讀法，延緩了清化過程，而不像是從吳語借用的。" Zhengzhang's views have at times been imperfectly represented by other authors, as at Norman (2000:276).

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Abbreviations

DK	Díkǒu
JY	Jiànyáng
JYZ	Jiānyang xian zhi [Jiānyang local gazeteer]
MC	Middle Chinese
MNYCD	Taiwan Minnanyu changyong cidian [Dictionary of basic vocabulary of Taiwanese Southern Mǐn]
NM	Northern Mǐn
pHM	proto-Hmong-Mien
pMǐn	proto-Mǐn
PNM	proto-Northern Mǐn
PNWM	Proto Northwestern Mǐn
SB	Shǐbēi
ZQ	Zhènnián

Appendix

Voiced ~ voiceless alternants in Northern Mǐn

Here I list SB and JY examples of voiced ~ voiceless alternant pairs along with lexical or phrasal context where available; “n.c.” = no context given in the source. SB is largely from Huang (2001a). JY forms and definitions are all from Norman (1969) except as noted; in other cases, English glosses are mine, based on Huang’s (2001a) or Akitani’s (2008) Chinese where available. Historical lower register examples from (10) ‘nose’ forward are my own speculative additions.

MC	NM voiceless	NM voiced + tone shifted
(1) <i>pan</i> <sup>A</sup> 搬 'carry; move'	SB: <b>puaiŋ</b> <sup>1</sup> ts <sup>h</sup> io <sup>5</sup> 搬□ 'move house' (Huang 2001a: 305) JY: <b>poiŋ</b> <sup>1</sup> , n.c. (Norman 1971: 133 “literary”; colloquial examples at Yue 2013: 120)	SB: <b>buaiŋ</b> <sup>2</sup> , n.c. ( <i>yòu dú</i> 又讀 at Akitani 2008: 77) JY: <b>voiŋ</b> <sup>9</sup> tshio <sup>5</sup> 搬□ 'move one's residence'
(2) <i>pæn</i> <sup>A</sup> 斑 'spot'	SB: tsia <sup>6</sup> te <sup>3</sup> <b>paiŋ</b> <sup>5</sup> ~ <b>paiŋ</b> <sup>1</sup> 隻仔斑 'freckles' (Huang 2001a: 305) JY: <b>paiŋ</b> <sup>1</sup> , n.c. (Yue 2013: 104)	SB: <b>baiŋ</b> <sup>2</sup> miŋ <sup>6</sup> 斑面 'pockmarked face' (Huang 2001a: 305) JY: <b>vaiŋ</b> <sup>9</sup> , n.c. (Yue 2013: 104)

MC	NM voiceless	NM voiced + tone shifted
(3) <i>poŋ</i> <sup>A</sup> 崩 'collapse'	JY: pain <sup>1</sup> , n.c. (Norman 1971: 208 "literary")	SB: bain <sup>2</sup> suain <sup>1</sup> 崩山 'avalanche' (Huang 2001a: 304) JY: vain <sup>9</sup> , n.c. (Yue 2013: 98)
(4) <i>pjiŋ</i> <sup>C</sup> 沸 'boil'	[SB: sy <sup>3</sup> fiy <sup>1</sup> lɔ <sup>5</sup> 水沸了 'the water is boiling' (Huang 2001a: 303, but fiy <sup>1</sup> features an anomalous combination of onset and tone)] JY: p <sup>h</sup> y <sup>5</sup> , n.c. (JYXZ 1994: 847; Yue 2013: 120)	SB: y <sup>5</sup> ~ fiy <sup>2</sup> sy <sup>3</sup> 沸水 'boiled water' (Huang 2001a: 303, Akitani 2008: 100 only fiy <sup>2</sup> ) JY: ȳy <sup>9</sup> (?) in "沸水" 'boiled water' (Yue 2013: 120)
(5) <i>tan</i> <sup>A</sup> 單 'single'	SB: ku <sup>1</sup> tuain <sup>1</sup> 孤單 'alone, lonely' (Huang 2001a: 305) JY: tueŋ <sup>1</sup> tsie <sup>3</sup> 單仔 'list'	SB: duain <sup>2</sup> sain <sup>1</sup> neŋ <sup>5</sup> 單身人 'bachelor' (Huang 2001a: 305) JY: lueŋ <sup>9</sup> siŋ <sup>1</sup> 單身 'bachelor'
(6) <i>tam</i> <sup>A</sup> 擔 'carry on shoulder'	SB: piŋ <sup>3</sup> tan <sup>1</sup> 扁擔 'shoulder pole'; ts <sup>h</sup> iŋ <sup>6</sup> tan <sup>1</sup> 籤擔 'sharpened shoulder pole' (both Huang 2001a: 306–307) JY: lan <sup>9</sup> tan <sup>1</sup> 擔擔 'carry a shoulder load'	SB: dan <sup>2</sup> kio <sup>7</sup> 擔轎 'carry a sedan chair; sedan chair carrier'; dan <sup>9</sup> ~ dan <sup>5</sup> tan <sup>1</sup> 擔 擔 'carry a shoulder load' (both Huang 2001a: 307; 'sedan chair' is kiau <sup>6</sup> at Akitani 2008: 109) JY: lan <sup>9</sup> tan <sup>1</sup> 擔擔 'carry a shoulder load'
(7) <i>toj</i> <sup>C</sup> 戴 'carry; wear'	SB: Tuai <sup>5</sup> [surname] (Huang 2001a: 311) JY: tue <sup>5</sup> , n.c. (JYXZ 1994: 848; Yue 2013: 60)	SB: duai <sup>2</sup> mɔ <sup>6</sup> te <sup>2</sup> 戴帽仔 'wear a hat'; duai <sup>2</sup> fiy <sup>2</sup> keŋ <sup>1</sup> 戴圍巾 'wear a scarf' (both Huang 2001a: 311) JY: le <sup>9</sup> ~ lue <sup>9</sup> , n.c. 'wear (a hat)'
(8) <i>kaw</i> <sup>A</sup> 高 'tall'	SB: kɔ <sup>1</sup> , n.c. (Huang 2001a: 317) JY: kau <sup>1</sup> , n.c. (Hòushān 後山 at Yue 2013: 103)	SB: fiɔ <sup>2</sup> , n.c. (Norman 2000: 277) JY: au <sup>9</sup> , xau <sup>9</sup> , hau <sup>9</sup> 'tall', n.c. (various locales; see Yue 2013: 103)
(9) <i>kat</i> <sup>D</sup> 割 cut'	SB: kuai <sup>7</sup> , n.c. (Akitani 2008: 108; Huang 2001a: 42 Footnote 18 has "intransitive" uai <sup>7</sup> = Akitani's ʔuai <sup>7</sup> )	SB: huai <sup>2</sup> in "割肉" (Akitani 2008: 108; "transitive" at Huang 2001a: 42 Footnote 18)
(10) <i>bjiŋ</i> <sup>C</sup> 鼻 'nose'	SB: p <sup>h</sup> i <sup>6</sup> 'nose' (Zhengzhang 1985: 44) [ZQ: p <sup>h</sup> i <sup>5</sup> 'nose' (Akitani 2008: 305)]	SB: bi <sup>6</sup> 'to smell' (Zhengzhang 1985: 44) [ZQ: pi <sup>2+</sup> 'to smell' (Akitani 2008: 305)]
(11) <i>djaŋ</i> <sup>A</sup> 長 'long'	SB: mɔ <sup>5</sup> te <sup>3</sup> ton <sup>5</sup> 尾仔長 '[its] tail is long' (in folksongs [gēyáo 歌謠] #1 and #3 at Huang 2001a: 313, 314)	SB: don <sup>2</sup> mi <sup>5</sup> ɔ <sup>3</sup> 長棉襖 'long padded jacket'; don <sup>2</sup> k <sup>h</sup> i <sup>5</sup> 長氣 'long-winded (?)' (Huang 2001a: 303; 'padding' is min <sup>5</sup> at Akitani 2008: 118)

MC	NM voiceless	NM voiced + tone shifted
		JY: loŋ <sup>9</sup> , n.c.
(12) <i>dʒaŋ</i> <sup>B</sup> 上 ‘go up’, <i>dʒaŋ</i> <sup>C</sup> 上 ‘top’	SB: lau <sup>5</sup> teioŋ <sup>6</sup> ‘upstairs’ (Akitani 2008: 114) JY: hieŋ <sup>1</sup> tsioŋ <sup>6</sup> 天上 ‘in the sky’	SB: hioŋ <sup>5</sup> (“verb” at Akitani 2008: 114) JY: ioŋ <sup>5</sup> sueŋ <sup>1</sup> 上山 ‘climb a mountain’
(13) <i>ʒik</i> <sup>D</sup> 食 ‘eat; food’	SB: ɕi <sup>1</sup> in bi <sup>2</sup> ɕi <sup>1</sup> 蔽食? ‘cover for bowls of food’ or piŋ <sup>3</sup> ɕi <sup>1</sup> 扁食 ‘wonton’ (this is speculation based on Akitani 2008: 96–97) JY: si <sup>8</sup> in pieŋ <sup>3</sup> si <sup>8</sup> 扁食 ‘wonton’ and “食指” ‘index finger’	SB: fie <sup>2</sup> ‘eat’ (Akitani 2008: 104) JY: ie <sup>8</sup> ‘to eat’
(14) <i>ɣwæŋ</i> <sup>C</sup> 話 ‘speak’	SB: ʔua <sup>6</sup> , n.c. (Akitani 2008: 102)	SB: fua <sup>6</sup> , n.c. (Akitani 2008: 102) JY: ua <sup>6</sup> ‘to speak’, n.c.
(15) <i>ɣæwk</i> <sup>D</sup> 學 ‘learn’	SB: xɔ <sup>1</sup> in “學堂”, etc. (Akitani 2008: 81); perhaps a late borrowing given JY ha <sup>8</sup> in similar words	SB: ɦɔ <sup>2</sup> , n.c. (“verb” at Akitani 2008: 81) JY: o <sup>8</sup> ‘to learn’
(16) <i>ɣwε</i> <sup>C</sup> 畫 ‘drawing’, <i>ɣwεk</i> <sup>D</sup> 畫 ‘draw’	SB: xua <sup>6</sup> ‘picture (n.)’ (Akitani 2008: 102) JY: ua <sup>5</sup> xua <sup>6</sup> ‘to paint a picture’	SB: fua <sup>2</sup> ‘draw (v.)’ (Akitani 2008: 102) JY: ua <sup>5</sup> xua <sup>6</sup> ‘to paint a picture’

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*Author's address*

Jonathan Smith  
Christopher Newport University  
105 McMurran Hall  
1 Avenue of the Arts  
Newport News, Virginia 23606  
United States  
jonathan.smith@cnu.edu

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