

## Valence-Changing Prefixes and Voicing Alternation in Old Chinese and Proto-Sino-Tibetan: Reconstructing \*s- and \*N- Prefixes\*

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A voicing alternation in the Middle Chinese pronunciation of the initial consonant of Chinese verbs has long been recognized as the reflection of a morphological process dating to the Old Chinese period or earlier. As illustrated by the pair of words *zhāng* 張 (MC *trjang*) ‘to stretch (trans.)’: *cháng* 長 (MC *drjang*) ‘to be long (intrans.)’, this morphological process is associated with transitive/intransitive word pairs. There is disagreement among historical phonologists about whether this alternation should be attributed to a detransitivizing nasal voicing prefix \*N- or to a causativizing sibilant devoicing prefix \*s-. In this paper I summarize the internal and comparative evidence and review the recent arguments put forth by specialists in support of both views, and conclude that both explanations are not entirely satisfactory. I propose that further research must consider the possibility that several processes were at work, and that productive and frozen morphological processes may have co-existed with analogical leveling at various points before and during the Old Chinese period.

Key words: Old Chinese morphology, Old Chinese phonology, detransitivizing prefix, causative prefix, voicing alternation

### 1. Voicing alternations in Chinese

A voicing alternation in the Middle Chinese pronunciation of the initial consonant of Chinese verbs has long been recognized as the reflection of a morphological process dating to the Old Chinese period or earlier.<sup>1</sup> Among the many oft-cited examples of this

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<sup>1</sup> The Chinese term for this alternation is *qīngzhuó biéyì* 清濁別義. It is not necessary in this

alternation are the following pairs of Chinese words, presented with Middle Chinese transcriptions.<sup>2</sup>

**Table 1:** Middle Chinese voicing alternation

<u>Set A</u>	<u>Set B</u>
<i>jiàn</i> 見 <i>kenH</i> ‘to see’	<i>xiàn</i> 現 <i>henH</i> ‘to appear’
<i>bié</i> 別 <i>pjet</i> ‘to separate (trans.)’	<i>bié</i> 別 <i>bjet</i> ‘to depart; to be different’
<i>zhé</i> 折 <i>tsyet</i> ‘to break, bend (trans.)’	<i>shé</i> 折 <i>dzyet</i> ‘to bend (intrans.)’
<i>bài</i> 敗 <i>paejH</i> ‘to defeat’	<i>bài</i> 敗 <i>baejH</i> ‘to suffer defeat’
<i>zhòng</i> 中 <i>trjuwngH</i> ‘to hit the target’	<i>zhòng</i> 仲 <i>drjuwngH</i> ‘to be in the middle > middle brother, second of three sons’
<i>jiá</i> 夾 <i>keap</i> ‘to press between’	<i>xiá</i> 狹 <i>heap</i> ‘narrow, pressed on both sides’
<i>zhāng</i> 張 <i>trjang</i> ‘to stretch (trans.)’	<i>cháng</i> 長 <i>drjang</i> ‘to be long’

The phonological alternation may be simply described. The first member of each pair has a voiceless unaspirated initial, while the second member has a voiced initial. The pronunciations of the two words are otherwise identical. The alternating Middle Chinese initials are generally homorganic, but if not they can be shown to derive from homorganic Old Chinese precursors.

The semantics of the alternation are not as easily described and have been cast in different terms by various scholars. The traditional nomenclature describes the Set A words as ‘transitive’ and the Set B words as ‘intransitive’ (Pulleyblank 1973, Sagart 1999, Sagart 2003).<sup>3</sup> Schuessler (2007) refers to Set A as ‘simplex’ and Set B as ‘endopassive’. Mei (2009, 2012) uses the terms ‘causative’ and ‘simplex’ for Sets A and

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paper to recapitulate the long history of scholarship identifying and discussing this phenomenon, often in the context of ancient Chinese word families. For references to earlier works of scholarship in this area, the reader may consult the bibliographies of Pulleyblank (1989), Sagart (2003), Phua (2004), and Mei (2009). For scholarship on voicing alternations and prefixation in Tibeto-Burman, consult the references in Dai (2001), LaPolla (2003), and Matisoff (2003). In this study we shall be concerned primarily with scholarship of the last two decades.

<sup>2</sup> The Middle Chinese transcriptions are from Baxter (1992), modified as described in Sagart & Baxter (2009:222, fn.3). Note that in this transcription *h* represents a voiced guttural fricative ([ɣ] or [ɦ]), which is a reflex of Old Chinese \*g; *-H* represents *qù* 去 tone. For additional examples of this alternation pattern, see Sagart (2003:758-759). In some cases both members of a pair are written with the same Chinese character, in other cases with different characters, but this has no bearing on the nature of the underlying alternation.

<sup>3</sup> Sagart’s initial hypothesis concerning the reconstruction of Set A and Set B words has been integrated into the Baxter & Sagart system of Old Chinese (e.g. Baxter & Sagart 2011), and subsequent refinements of the hypothesis should be attributed to both scholars. However, for simplicity in this paper I shall refer to the hypothesis as Sagart’s.

B respectively.<sup>4</sup> These differences in terminology are summarized in Table 2. They reflect different analyses of Old Chinese morphosyntactic categories as well as different understandings of the nature of the derivational process involved. It also must be noted that not all pairs participating in the voicing alternation have a straightforward semantic or syntactic relationship. In other words, there are exceptions that do not fit into the general categories just described.

An accurate, though incomplete, description of the morphological alternation is to say that the Set A words have higher valence than the Set B words. Phrased another way, the first verb in each pair takes an additional overt argument in comparison with the second verb in each pair. We can use the rather informal terms “outer directed” and “inner directed” to describe the semantics of the members of each pair. This description of semantics is admittedly vague; indeed, it is essentially a tautological reiteration of the syntactic distinction, since the addition of a verbal argument necessarily implies a greater degree of interaction beyond the subject of the verb. Nevertheless, this terminology has the advantage of neutrality in that it doesn’t favor any one scholar’s interpretation over the others.<sup>5</sup>

**Table 2:** Terms for the syntactic/semantic properties associated with the voicing alternation

	<u>Set A</u>	<u>Set B</u>
Sagart (2003)	transitive	intransitive
Schuessler (2007)	simplex	endopassive
Mei (2009)	causative	simplex
the present study	higher valence outer directed	lower valence inner directed

## 2. Proposed origins of the voicing alternation

There are two basic analytical approaches that can logically be taken to explain the origin of the morphological alternation. The first is to assume that the Set A words are basic, and that the Set B words were derived from them through a valency-decreasing process that voiced the root-initial consonant. The second is to assume that the Set B

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<sup>4</sup> We note the unfortunate and confusing circumstance that the same set of words—those labeled Set A—may be described as both ‘simplex’ and ‘causative’ even though those terms are normally in opposition, and that the term ‘simplex’ has been applied to both Set A words and Set B words.

<sup>5</sup> These terms have been used in various studies of Tibetan and Tibeto-Burman morphosyntax. See, for example, Matisoff (2003:117-118).

words are basic, and that the Set A words were derived from them through a valency-increasing process that devoiced the root-initial consonant. From the perspective of universal linguistic processes, both of these possibilities seem plausible.<sup>6</sup> As for the cause of the voicing alternation itself, it may be assumed that a morphological prefix was involved. In the case of a valency-decreasing derivation (A→B), the prefix would have been a voiced element that caused a following voiceless consonant to become voiced; in the case of a valency-increasing derivation (B→A), the prefix would have been a voiceless element that caused a following voiced consonant to become voiceless.<sup>7</sup> Because of later sound changes the prefix was itself lost, leaving only the voicing alternation.

Both of these logical possibilities described above have been proposed by scholars. Scholars who have worked on this problem have in most cases looked to the Tibeto-Burman [TB] languages, presumed to be genetically related to Chinese, in order to provide substance to their formulations of the phonological and semantic processes at work in Old Chinese.<sup>8</sup>

Among the Tibeto-Burman languages, word-family alternations between homorganic initial consonants are commonly found. Benedict (1972:124) believed that voicing alternation of the root initial was a basic Tibeto-Burman morphological process that could be reconstructed at the Proto-Tibeto-Burman [PTB] level: “In Tibetan, Kiranti, Bahing, Vayu, and Bodo-Garo the fundamental contrast is that between intransitives with sonant [i.e. voiced] initials and transitives with surd [i.e. voiceless] initials, and this contrast surely is to be regarded as an inherited TB feature”. Benedict saw this alternation as distinct from, but a possible source of, the commonly observed alternation in Lolo-Burmese between intransitive forms with voiceless unaspirated initials and transitive forms with voiceless aspirated initials, which is normally ascribed to a Lolo-Burmese causativizing prefix \*s- (p.125). He also saw it as distinct from alternations resulting from prefixation in Tibetan.

More recent views about the Tibeto-Burman voicing alternation are expressed in LaPolla (2003) and Matisoff (2003). LaPolla (2003:24) follows Benedict in noting that some voicing alternations seem to be attributable to prefixes, while others do not. Matisoff (2003:15-16) implies that all voicing alternations ultimately arose under the influence of prefixal elements, while noting that because prefixes often are irregularly

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<sup>6</sup> For an alternative view, see Phua (2004:38-40).

<sup>7</sup> It is also possible, though less likely, that dissimilatory rather than assimilatory processes were at work. We shall not consider this possibility here, since there seems to be little evidence for it.

<sup>8</sup> I take the widely-accepted position that Chinese is genetically related to the Tibeto-Burman languages. The precise nature of that relationship is not relevant to the discussion here. On the question of the position of Chinese vis-à-vis Tibeto-Burman, see Handel (2008).

preserved, direct evidence of their existence may not be recoverable in all cases. He further notes (2003:89) that the “most ancient” Tibeto-Burman morphological alternation involves prefix \*m- marking “inner-directed or stative verbs” and prefix \*s- marking “transitive or outer-directed or causative verbs”.

While there seems little doubt that the Chinese voicing alternation phenomenon bears some relationship to the phenomena observed in Tibeto-Burman, it seems unlikely that there is a precise one-to-one correlation; in other words, it is probably not the case that a single morphological process in Proto-Sino-Tibetan [PST] accounts for all of the voicing alternation phenomena of Old Chinese and Tibeto-Burman. In fact, given the number of different morphological processes that are seen in Tibeto-Burman, the possibility that multiple processes were at work in Old Chinese—and were perhaps muddled up through the effects of analogical leveling and extension over time—cannot be dismissed out of hand. Yet some of the most recent claims about this morphological process are absolutist and mutually incompatible. On the one hand, Sagart (2003, 2006) and Sagart & Baxter (2010) (following earlier proposals by Baxter, Pulleyblank, and others, though with revisions based on additional evidence) propose an OC voicing prefix \*N-. On the other hand, Mei (2008, 2009, 2012) (following Gong and others) proposes an OC devoicing prefix \*s-. Both of these proposals appeal simultaneously to internal Chinese evidence and external comparative evidence.

### 3. Critical analysis—Tibeto-Burman

Without reviewing in detail all of the evidence concerning prefixes, voicing alternations, and related valency-changing processes in Tibeto-Burman, it will be useful to provide a brief summary.<sup>9</sup> We shall restrict our attention to the function of prefixes on verbal roots.

There is no doubt that a valency-increasing \*s- prefix with outer-directed semantics (often manifested as causativity) can be reconstructed for Proto-Tibeto-Burman. It is the first morphological element listed in LaPolla’s 2003 overview of Sino-Tibetan morpho-syntax. Matisoff (2003:89) notes that “transitive or outer-directed or causative verbs ... marked by the sibilant prefix \*s-” are a widespread and ancient feature of Tibeto-Burman, already recognized by Wolfenden in 1929. While overtly present in outer-directed verb forms in a number of TB languages, notably Tibetan and Jingpho, “often ... the only traces left by the proto-prefixes are oppositions in the manner of the

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<sup>9</sup> Dai (2001) provides a comprehensive overview of the various TB morphological alternations that have been attributed to prefixes \*N-, \*s-, or both. Dai, however, explicitly attributes every such pattern of alternation to the influence of \*s- alone. This position hardly seems tenable, as can be seen just from the small sample of data presented below.

initial consonants in the verb-pairs” (Matisoff 2003:90).

For example, Written Burmese has dozens of pairs like *nûi* ‘to be awake’ : *hnûi* ‘to awaken (someone)’ and *prat* ‘to be cut in two’ : *phrat* ‘to cut (something) in two’. This alternation pattern (aspiration in obstruents, voicing in resonants) can be definitively traced back to the presence of an earlier \*s- prefix, still seen in front of vowel-initial roots as in *ip* ‘to sleep’ : *sip* ‘to put to sleep’. In Loloish, this prefix changed to \*ʔ-, with effects that are sometimes manifested purely as tonal distinctions in languages like Lahu.

Similar patterns of alternation are found throughout the Tibeto-Burman languages. Of particular importance here is to note that devoicing of voiced root initials is a common effect of \*s-. Chang & Chang (1976:478) note: “[Some] causative pairs have a simple voiced-stop initial in the non-causative of both Tibetan and Liang-shan Lolo [Northern Yi, aka Nuosu], which appears to have been devoiced by \*s- in the causative”.

We should also, however, note that *s-* does not necessarily always have a devoicing effect in Tibeto-Burman languages. A comparison of Written Tibetan forms having *s-* with modern pronunciations in various Tibetan varieties shows that while devoicing of following resonants is common, voiced obstruents tend to remain voiced after *s-* (unless, of course, the language in question has no voicing contrast), often leading to voicing assimilation of earlier *s-*. The following table, adapted from Zhang (2009:261-262), illustrates these patterns with Amdo Tibetan dialects that retain a voicing distinction:

**Table 3:** Written Tibetan (WT) forms with *s-* compared to modern Tibetan dialects<sup>10</sup>

	WT	Qilian 祁連 (Dola)	Dari 達日 (Darlag)	Xiahe 夏河 (Sangchu)	Ledu 樂都 (Drotsang)
star	<i>skar.ma</i>	ʃkærmæ	ʃkarma	xkarma	hkærma
door	<i>sgo</i>	rgo	rgo	ɣgo	figo
thousand	<i>stong</i>	ʃtoŋ	ʃtoŋ	xtoŋ	htoŋ
claw	<i>sder.mo</i>	rdermo	rdermo	ɣdermo	fidermo
fur	<i>spu</i>	ʃpə	ʃpə	hwə	hpu
frog	<i>sbal.pa</i>	rbæwa	rwawa	wawa	fibawa
front	<i>sngon</i>	ʃŋən	ŋən	ɣŋon	fŋan tsho
heart	<i>snying</i>	ʃn̥aŋ	n̥aŋ	ɣn̥aŋ	f̥naŋ
nose	<i>sna</i>	ʃn̥æ	n̥a	ɣna	f̥na
medicine	<i>sman</i>	ʃm̥an	m̥an	ɣman	f̥man

<sup>10</sup> Qilian and Ledu are located along the eastern edge of Qinghai province, Xiahe is in south-western Gansu, Dari is in southeastern Qinghai. All are Amdo Tibetan varieties, which unlike Central Tibetan dialects are generally toneless, preserve consonant clusters to some degree, and to some degree retain a voicing distinction in initial consonants (Gesang & Gesang 2002).

In none of the forms are WT voiced initials *g-*, *d-*, or *b-* devoiced. In Qilian and Dari, however, nasals *ng-*, *ny-*, *n-*, and *m-* are consistently devoiced.

There is also little doubt that a valency-decreasing prefix \*N- (equivalent to Matisoff's \*m-) with inner-directed semantics can be reconstructed for Tibeto-Burman. Indeed, Matisoff (2003:89) introduces \*s- and \*m- together, treating them as elements of an early paradigm.<sup>11</sup> On page 117, he elaborates on the semantics of \*m-: "the nasal prefix generally signals *inner-directed states or actions*, including 'middle voice' notions like stativity, intransitivity, durativity, reflexivity..." In many TB languages, including Tibetan, this prefix remains overtly present; in others it has, like \*s-, left traces in manner alternations of initial consonants or in tonal alternations. In particular, \*N- had a tendency to either voice a following voiceless obstruent, or to preserve the voicing of a following voiced obstruent that would otherwise have devoiced.

In only a small number of cases can we find survivals of both \*N- and \*s- present in the same verbal paradigm. Perhaps the best-known example is the Written Tibetan pair *mnam* 'have a smell (intransitive)' : *snam* 'sniff (something) (transitive)'. In many more cases we see the effects of these prefixes reflected in the types of consonant alternations described above. Some TB languages make greater use of \*N- in morphological verb paradigms; others make greater use of \*s-. Some languages show clear evidence of both. Indeed, there are examples in Lahu of paradigms involving both \*N- and \*s-, and of paradigms involving just \*s-.<sup>12</sup>

Finally, in some languages such as Written Tibetan, we not only observe some alternations with overt *m-* and some alternations with overt *s-*, but also voicing alternations that seem to suggest the effects of the earlier presence of one or both prefixes. This fact, along with the complexity of the patterns seen in many other TB languages, suggests that these prefixes remained productive over a long period of time even as their prefixal status was lost in particular lexical items. As a result, within the lexicon of a single language, we can often see frozen morphological processes coexisting with productive ones, as manifested by distinct phonological effects. This also, of course, raises the possibility that voicing alternations originally attributable to lost prefixes \*s- or \*N- could have become productive in their own right by analogy. The combination of all these factors has led to the great profusion of morphological patterns currently seen in Tibeto-Burman languages.

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<sup>11</sup> These two prefixes have been discussed by many other scholars as well, for example Chang & Chang (1976).

<sup>12</sup> For example, Matisoff (2003:91) cites the pairs  
*dəʔ* < \*N-t- 'drink' : *tɔ* < \*s-t- 'give to drink'  
*tòʔ* < \*t- 'burn (intr.)' : *tú* < \*s-t- 'set on fire'

What is striking about both \*N- and \*s- in Tibeto-Burman is the degree to which these prefixes remained productive in various branches and languages throughout the history of the family, even as their phonological manifestations and semantic subtleties diverged in various ways. As a result, there are very few examples of pairs of verbs distinguished by \*N- and/or \*s- that are attested widely throughout the family. To put it another way, while it seems clear that \*N- and \*s- existed at the earliest reconstructible stages of the language, it is seldom possible to reconstruct specific verb forms with \*s- or \*N- at the PTB stage. From the perspective of comparative Sino-Tibetan, this means that we cannot rely on evidence from TB cognates to reconstruct these prefixes in individual words of Old Chinese. Instead, we can hypothesize that Chinese inherited productive forms of \*N- and \*s-, and that these prefixes were applied to verb forms throughout the early stage of the language. In order to determine which words took these prefixes, we should primarily rely on evidence that bears directly on Chinese pronunciations.

#### 4. Critical analysis – Old Chinese

Sagart, Mei, and Gong work with Old Chinese reconstructions that differ in a number of respects, both substantively and notationally. For example, Gong and Mei use systems having four main vowels, while Baxter & Sagart's (2011) system used by Sagart has six vowels; Baxter & Sagart's system includes a set of uvular initials, which are not found in Mei and Gong. For the purposes of this paper, however, these differences are largely irrelevant.<sup>13</sup> All the systems posit a basic three-way distinction in obstruent initials: voiceless unaspirated (e.g. \*p- \*t- \*k-), voiceless aspirated (e.g. \*p<sup>h</sup>- \*t<sup>h</sup>- \*k<sup>h</sup>-), voiced (e.g. \*b- \*d- \*g-), which in the absence of pre-initial elements preserve their voicing and aspiration features as they develop to Middle Chinese.

##### 4.1 Sagart

Sagart (1994, 1999, 2003) attributes the morphological alternations seen in Chinese verb pairs to a nasal prefix \*N- which caused voiceless unaspirated initials of verb roots to become voiced.<sup>14</sup> The verb pairs from Table 1 are given again below with the Old

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<sup>13</sup> For details concerning each system, the reader should consult the published works of each scholar.

<sup>14</sup> The idea of a voicing prefix accounting for this alternation is credited to Pulleyblank (1973). Sagart's \*N- is different from his \*m-, a nasal prefix with different phonological and semantic effects (Sagart 1999:79-86, Sagart & Baxter 2010).

Chinese reconstructions of Baxter & Sagart (2011):<sup>15</sup>

**Table 4:** Sagart's proposed reconstructions

<u>Set A</u>	<u>Set B</u>
見 * $[k]^{\text{e}}$ en-s 'to see'	現 *N- $[k]^{\text{f}}$ en-s 'to appear'
別 *pret 'to separate (trans.)'	別 *N-pret 'to depart; to be different'
折 *tet 'to break, bend (trans.)'	折 *N-tet 'to bend (intrans.)'
敗 * $p^{\text{f}}$ ra[t]-s 'to defeat'	敗 *N- $p^{\text{f}}$ ra[t]-s 'to suffer defeat'
中 *truŋ-s 'to hit the target'	仲 *N-truŋ-s 'to be in the middle > middle brother, second of three sons'
夾 *C.k <sup>l</sup> <r>ep 'to press between'	狹 *N-k <sup>l</sup> <r>ep 'narrow, pressed on both sides'
張 *C-traŋ 'to stretch (trans.)'	長 *Cə-[N]-traŋ 'to be long' <sup>16</sup>

The reconstruction of \*N- in Set B words is supported in part by evidence for nasals in early borrowings of Chinese Set B words into Mien, as noted by Downer (1973) and discussed in Sagart (1994, 1999, and 2003). It is also based in part on reference to various Tibeto-Burman languages that have nasal prefixation with stativizing semantics. As clarified in Sagart (2003), the hypothesis is that a de-transitivizing prefix \*N- attached to verb roots. If the initial of the root was voiceless unaspirated, it became voiced, e.g. \*N-p- > \*b-. If it was voiceless aspirated, it did not change, e.g. \*N-k<sup>h</sup>- > \*k<sup>h</sup>-.<sup>17</sup> Evidence for \*N- attaching to verb roots with voiced initials is lacking. This is the reason that the pairs of words participating in this voicing alternation paradigm all have voiceless unaspirated root initials.

It should be pointed out that Baxter and Sagart also reconstruct a causative prefix \*s- (Sagart 1999:62-73, Sagart & Baxter 2012). But this prefix is not involved in Sagart's reconstruction of the alternation pattern above, and in fact its potential use for these verb pairs is precluded by the sound changes attributed to \*s- elsewhere in the system.<sup>18</sup>

<sup>15</sup> For the purposes of this article, the details of the reconstructions aside from the presence and absence of \*N- are not crucial.

<sup>16</sup> This word is reconstructed with \*Cə- as well as \*N-, presumably because the Min cognate is reconstructed with a "softened" initial by Jerry Norman. See below for more on this point. A reconstruction of \*N-traŋ would also be consistent with the Middle Chinese pronunciation, and indeed \*N-traŋ is the form seen in Sagart (2006:64).

<sup>17</sup> An example of this development is found in the word *kāi* 開 'to open (v.i.)', discussed in more detail in Section 5 below. This hypothesis is actually prefigured in Gong (2001) (cf. the reconstruction on page 23 for *pī* 披: \*N-phrjal > \*phrjal), although based on entirely different argumentation.

<sup>18</sup> This argument is laid out in Sagart & Baxter (2012).

## 4.2 Mei

In a recent conference presentation, Mei (2009) argued for a distinctly different reconstruction of these verb pairs. Citing the evidence for causative TB prefix \*s- as presented in Chang & Chang (1976) and Dai (2001), Mei suggested that a similar OC prefix \*s- was responsible for the voicing alternation pattern. According to this hypothesis, the Set B forms with voiced initial are the roots, and the Set A forms are derived through prefixation, with \*s- having a devoicing effect on the root initials. This parallels the effect of \*s- before resonants, an effect hypothesized in Mei's earlier 1989 paper that explains the pair of words *miè* 滅 'destroy' < \*mjiat and *xuè* 威 'cause to be destroyed' < \*mjiat < \*smjiat, which both appear in Ode 192 of *Shijing* 詩經.<sup>19</sup> Mei thus implies the following reconstructions (based on the system of Gong 2001, which is in turn modified from that of Li Fang-Kuei):<sup>20</sup>

**Table 5:** Mei's proposed reconstructions

<u>Set A</u>	<u>Set B</u>
見 *s-gians 'to see'	現 *gians 'to appear'
別 *s-brjat 'to separate (trans.)'	別 *brjat 'to depart; to be different'
折 *s-djat 'to break, bend (trans.)'	折 *djat 'to bend (intrans.)'
敗 *s-brads 'to defeat'	敗 *brads 'to suffer defeat'
中 *s-drjəngws 'to hit the target'	仲 *drjəngws 'to be in the middle > middle brother, second of three sons'
夾 *s-griap 'to press between'	狹 *griap 'narrow, pressed on both sides'
張 *s-drjang 'to stretch (trans.)'	長 *drjang 'to be long'

## 4.3 Gong

Mei's conclusions are similar to those of Gong (2000) and Gong (2001).<sup>21</sup> However, there is a crucial and interesting difference. Gong posits a "Pre-Chinese" stage, earlier than Old Chinese. In Gong's system, Pre-Chinese \*Cr- (where *C* is a voiced stop *b*, *d*, or

<sup>19</sup> The Old Chinese reconstructions here are Mei's. The Baxter-Sagart reconstructions are \*met and \*m̥et, respectively.

<sup>20</sup> Reconstructions for 'to hit the target' : 'to be in the middle' and 'to press between' : 'narrow' do not appear in Mei (2009) or Mei (2012), so I have supplied the reconstructions. All of the other forms appear in Mei (2012) as shown here.

<sup>21</sup> Gong (2002), which contains reprints of Gong (2000) and Gong (2001), is listed among the references of Mei (2009) and Mei (2012). Mei's reference (2009:1, 2012:17) to Gong (2002: 187-188) is equivalent to a reference to Gong (2001:10-11).

g) develops to OC \*r- and then to Middle Chinese *l*-. In contrast, \*N-Cr- develops to OC \*Cr- and then to a Middle Chinese obstruent initial.<sup>22</sup> Thus in Gong's system, the reconstructions that Mei has offered above could not co-exist at the same stage of the language. For example, consider Gong's (2001:11) reconstructions of the following pairs of words:

**Table 6:** Gong's proposed reconstructions

<u>Set A</u>	<u>Set B</u>
別 PC *s-brjat > OC *prjat	別 PC *N-brjat > OC *brjat
敗 PC *s-brads > OC *prads	敗 PC *N-brads > OC *brads

Contrasting with both transitive 別 PC \*s-brjat > OC \*prjat 'to separate' and intransitive 別 PC \*N-brjat > OC \*brjat 'to depart; to be different', but in the same word family, is *liè* 裂 PC \*brjat > OC \*rjat 'to divide'. It is not clear how *liè* 裂 could be reconstructed in a way compatible with Mei's reconstructions in Table 5 without appeal to a prefix \*N-.

What we see in Gong (2001) is an approach distinct from that of both Sagart and Mei. Where Sagart accounts for the voicing alternation with a single prefix \*N-, and Mei accounts for it with a single prefix \*s-, Gong supplies both. Like Mei, Gong makes use of Tibeto-Burman comparison, but he focuses on Tibetan pairs showing the presence of both *m*- and *s*- (Gong 2001:10). This results in a neat solution, but raises additional questions. First, how do we explain the semantics of three-member paradigms with \*C-, \*N-C-, and \*s-C- initials? In terms of regular sound change into Middle Chinese, prefix \*N- is only required when medial \*-r- or \*-l- is present following the voiced root initial. If these medials are not involved, should Set A members be reconstructed with plain voiced \*C- or with prefixed \*N-C-? In the absence of a direct Tibetan cognate, it is unclear how this would be decided by Gong.

In sum, the proposals by Sagart, Mei, and Gong present us with a number of hypotheses to explain verbal voicing alternation, all of which appeal to parallels in Tibeto-Burman. Sagart's hypothesis is that only prefix \*N- is involved; Mei's that only prefix \*s- is involved; Gong's that both are involved. According to Sagart's proposal, verbs participating in the alternation have voiceless root initials; according to Mei's proposal, verbs participating in the alternation have voiced root initials; and according to Gong's proposal verbs participating in the alternation have voiced initials, although other alternations with voiceless initials are also elucidated (for example, see the reconstruction of *bāo/pāo* 胞 in Gong 2001:22).

<sup>22</sup> The medial \*-r- also regularly conditions Middle Chinese second-division vocalism. For more on the role of \*-r- in Gong's reconstruction, see Handel (2009:47-50).

## 5. Discussion: \*N-, \*s-, or both?

As noted earlier, both \*N- and \*s- are found throughout Tibeto-Burman (*contra* the exclusive focus placed by Dai 2001 and Mei 2009 on \*s-prefixation, but as recognized by Mei 2012).

Chang & Chang (1976:494-495) explicitly claim both \*N- and \*s- were at work in Chinese as well as in Tibeto-Burman: “If a nasal prefix was one source of voicing contrasts in Chinese, \*s- was another.” Evidence from Tibetan cognates was used by Chang & Chang to reconstruct both \*N- and \*s- in specific Chinese words.

Some of the broader questions raised by OC reconstructions of both \*N- and \*s- have been discussed at length by Phua (2004). He makes several interesting points. First, he notes (2004:21) that the causative \*s- prefix as reconstructed for Old Chinese by Baxter (1992) and Sagart (1999) is not related at all to the voicing alternations of Old Chinese. They provide no examples of \*sC<sub>[+vd]</sub> > \*sC<sub>[-vd]</sub> > \*C<sub>[-vd]</sub>. If a causativizing prefix \*s- existed in Old Chinese, Phua asks, why should it not attach to verbal roots with voiced initials? We shall return to this question below in light of modifications to the Baxter-Sagart system made since 1999.

Second, Phua (2004:25-26) considers the plausibility, on universal grounds, of a language with both a valency-decreasing prefix \*N- and a valency-increasing prefix \*s-, yet with the first occurring only with verb roots having voiceless initials, and the second only with verb roots having voiced initials. He concludes (2004:27) that “it is highly dubious to argue that the means of morphological derivation is divided into two opposing types based on the voicing of the initial of the [verb] root.” It is more natural, he claims, for the appropriate prefix to be determined by the semantics or category of the verb root, not its phonological shape.<sup>23</sup>

Third, Phua raises the possibility (2004:49) that distributional patterns seen in these proposed prefixes may allow us to reconstruct phonologically conditioned allophones which might more plausibly explain some of the phenomena involved.

Phua’s overall conclusions need not be discussed in detail here.<sup>24</sup> But the three points summarized above provide a useful perspective for further consideration of the proposals of Mei and Sagart. Let us suppose that, as in the Tibeto-Burman family, a

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<sup>23</sup> Consider for example the semantically equivalent English prefixes *un-* and *in-* (the latter having a number of allomorphs *im-*, *il-*, *ir-*, etc.). The choice of prefix generally depends on whether the root is of Latinate or non-Latinate origin, not on the phonological shape of the root.

<sup>24</sup> In summary, Phua believes that the basic source of the voicing alternation is \*s-. He argues that this prefix had an allomorph \*r- found before roots with acute initials. He proposes to eliminate Sagart’s \*N-, and associates Sagart’s \*m- with Gong’s \*N-. There are a number of serious problems with these conclusions, a discussion of which need not be undertaken here.

valency-decreasing prefix \*N- and a valency-increasing prefix \*s- both were present in the Old Chinese morphological system that was inherited from PST, and that both were employed in verbal paradigms. Let us further suppose that, as seen in many TB languages, both prefixes could attach to roots with all types of initial consonants: grave, acute, voiced, voiceless, etc. Initially these alternation patterns would not have had identical semantics. In other words, we would not expect that the semantic relationship between \*ROOT<sub>1</sub> and \*N-ROOT<sub>1</sub> would be exactly the same as that between \*s-ROOT<sub>2</sub> and \*ROOT<sub>2</sub>. But, as we have seen in TB languages, the precise semantic distinction between these two patterns may have been blurred over time. (Even if it had remained distinct, that distinction may not be fully recoverable based solely on evidence of the meanings of these word pairs from later stages of the language.)

If this were the case, then when we look at pairs of words like those in Table 1, how can we determine which of them originally involved \*N- and which originally involved \*s-? Sometimes we are fortunate to have direct evidence of the pronunciation of specific lexical items. An example of such evidence is that presented by Sagart (2003: 761-762): borrowings of specific Chinese lexical items into Hmong-Mien languages that preserve unequivocal reflexes of prenasalized consonants.<sup>25</sup> Sagart (2003) shows that such evidence may even permit us to reconstruct \*N- where Middle Chinese does not show a voicing alternation because the verb root begins with an aspirated initial. For example, the transitive and intransitive verbs ‘to open’ are homophonous in Middle Chinese, both with aspirated initial *kh-*. They are reconstructed this way in the current Baxter-Sagart system:

**Table 7:** Transitive and intransitive forms of *kāi* 開 ‘to open’

<u>Set A</u>	<u>Set B</u>
開 *[k] <sup>hc</sup> əj ‘to open (v.t.)’	開 *Nə-[k] <sup>hc</sup> ə[j] ‘to open (v.i.)’

The evidence for \*N- (here in the variant form \*Nə-, for reasons that are not clear to me) is found in Mien forms originally cited by Downer (1973) and given by Sagart (2003:759) as *khai*<sub>1</sub> (< Proto-Mienic \*kh-) ‘to open (transitive)’ : *gai*<sub>1</sub> (< Proto-Mienic \*ŋkh-) ‘to open (intransitive)’.

In some cases such direct evidence may be supplemented by comparative evidence. For the current example, it is interesting to note the form Jingpho *məkha* ‘be open, as a door’, from PTB \*m-ka ‘door’ (cited in Matisoff 2003:125).<sup>26</sup>

<sup>25</sup> Some of the examples in Sagart (2003) are cited from Downer (1973).

<sup>26</sup> This is a case where Matisoff indicates that TB cognates “unambiguously point to PTB \*m-”. Although I have noted above that the presence of prefixes in TB language forms is unlikely to definitely indicate their existence in Chinese cognate forms, we may also suppose that the

A less certain example of such direct evidence would be Jerry Norman's Proto-Min reconstruction of 長 'long' with 'softened initial' \*-d. Norman (1986) suggested that one origin of these 'softened initials' might have been prenasalization. If the Min word for 'long' did in fact reflect an earlier Chinese \*Nd- initial, this would fit the paradigm proposed by Sagart in Table 4 above.<sup>27</sup> The evidence provided by this example is more speculative because there is no clear-cut pattern relating the softened initials of Norman's reconstruction to the Set B members of alternating verb pairs.

But in the majority of cases evidence related to specific lexical items is lacking and we are forced to analogize, taking patterns established on the basis of direct evidence and extending them to other alternating pairs. The danger of over-analogizing in such a situation is always present.

Following Phua's suggestion that we look more carefully at complementary distribution, we notice some interesting patterns in the distribution of \*s- in the Baxter-Sagart system.

As described in Sagart & Baxter (2012), the development of their \*sC- clusters is quite complex. Reflexes include Middle Chinese *s-*, *z-*, *sy-*, *zy-*, and *C-*. In the case where \*s- occurs before a resonant *R*, the general development is \*sR- > *s-*. These sound change rules mean that Baxter & Sagart do not reconstruct causative \*s- in many forms where other scholars have posited it as a source of voiceless resonants. We have already seen, for example, Mei's 1989 proposal that *xuè* 威 'cause to be destroyed' < \*mjiat < \*smjiat is derived from *miè* 滅 'destroy' < \*mjiat by \*s-prefixation. But Baxter & Sagart reconstruct *xuè* 威 as \*m̥et, since the Middle Chinese initial is *x-*, not *s-*, and in their system \*sm- would yield *s-*.

However, in the Baxter & Sagart system the distribution of \*s- is notably limited. In cases where \*s- has identifiable causative semantics its distribution is even more limited.

I have reviewed all occurrences of pre-initial \*s in Baxter & Sagart (2011).<sup>28</sup> I count

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likelihood is increased when the prefix can be reconstructed at the PTB level for a specific lexical item, as this suggests the possibility that a derived form may have already been fully lexicalized in PST.

<sup>27</sup> Such a reconstruction, however, would be incompatible with the current Baxter-Sagart system, which reconstructs \*Cə- as the origin of Proto-Min softened initials. This is apparently the reason that the reconstruction for 'long' seen in Table 4 contains both \*Cə- and \*N-. See Handel (2010) for another solution to the problem of how to reconstruct this word so that it both fits the paradigm and explains the Min softened initial.

<sup>28</sup> This data set contains approximately 4,000 forms. While it does not constitute a complete reconstruction, it is sufficiently large to provide an indication of the general patterns found in the reconstruction system. Note that some occurrences of \*s are followed by a hyphen <-> and others by a period <.>. The notation is explained in Sagart & Baxter (2009:236): "We use

a total of approximately 220 occurrences.<sup>29</sup> Nearly all—206—occur before a resonant, a uvular, or a dental. Some typical examples are:

- (1) 歲 *sui* < *sjwejH* < \*s-q<sup>wh</sup>at-s ‘year’
- (2) 膝 *xī* < *sit* < \*s.tsik ‘knee’
- (3) 商 *shāng* < *syang* < \*s-taŋ ‘musical note’
- (4) 食 *sì* < *ziH* < \*s-m-lək-s ‘feed’
- (5) 羞 *xiū* < *sjuw* < \*s-nu ‘shame’

There are also 5 occurrences of capital \*S, also known “metathesizing \*S”. Three occur before a labial, and two before a dental; none have causative semantics and all but one are written with a following <.> indicating that they have no obvious morphological function. These five examples are given in (6)-(10).

- (6) 眨 *zhǎ* < *tsreap* < \*mə-ts<sup>r</sup>[a]p (< \*mə-S.p<sup>r</sup>rap ?) ‘blink’
- (7) 匠 *jiàng* < *dzjangH* < \*S.[b]aŋ-s ‘craftsman’
- (8) 自 *zì* < *dzijH* < \*S.[b]i[t]-s ‘to follow; from’  
cf. 自 *zì* < *dzijH* < \*N-tsi[t]-s ‘self (adv.)’ and 鼻 *bí* < *bjjjH* < \*m-[b]i[t]-s ‘nose’
- (9) 椒 *jiāo* < *tsjew* < \*S.tew ‘pepper plant’
- (10) 甑 *zèng* < *tsingH* < \*S-təŋ-s ‘boiler for steaming rice’

\*s never occurs before a non-resonant labial and occurs only fourteen times before a non-resonant velar. Of those fourteen occurrences, only four are identified as prefixes written <\*s-> (with a hyphen) rather than <\*s.> (with a period). They are listed as (11)-(14).

- (11) 翅 *chì* < *syex* < \*s-k<sup>h</sup>e-s ‘wing’
- (12) 示 *shì* < *zyijH* < \*s-gij?-s ‘show (v.)’
- (13) 蓍 *shī* < *syij* < \*s-kij ‘Achillea (?)’
- (14) 收 *shōu* < *syuw* < \*s-kiw ‘collect; harvest’

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a period to separate a minor syllable from a main syllable when the minor syllable plays no detectable morphological role and could be part of the root.” In other words, when <-> is present, we can assume that Baxter & Sagart have identified a morphological role for \*s. Both types of \*s appear to obey the same co-occurrence restrictions.

<sup>29</sup> Of these 220 occurrences, 145 are instances of <\*s-> and 75 are instances of <\*s.>. In addition, I count one example of <\*S->, four examples of <\*S.>, 12 examples of <\*sə->, and 22 examples of <\*sə.>. \*S- is distinguished from \*s- by its metathesizing function. If all of these variants are included, the total count is 259.

Of these four examples, only one clearly involves causativizing <\*s->.<sup>30</sup> 示 *shì* ‘show (v.)’ is explained in Sagart & Baxter (2012:49-50) as a causative derivation from (15).

(15) 視 *shì* < *dzyijX* < \**gijʔ* ‘look, see’

The extreme paucity of examples of causative \*s- occurring before labials and velars, when it is very commonly found before other places of articulation, is notable. Sagart & Baxter point out that in their system \*s- before velars is only detectable in Type B syllables with front vowels (where the result is MC *sy-* or *zy-*); whereas, in Type A syllables or before nonfront vowels, \*sK- and \*K- develop identically. It might therefore be argued that many more words likely had \*s- before velars in OC, but that this prefix is simply not recoverable from the MC pronunciation.

There are several difficulties with this counter-argument. The first is that, if causative \*s- did occur before velars with greater frequency, we should find a substantial number of pairs of homophonous words in Middle Chinese, derived from OC velar initials, where the semantics show that one is clearly a causative derivation from the other. To my knowledge no such pairs have been identified. Second, even in Type B syllables where a distinction in pronunciation would be preserved, only a single example has been discovered—yet Type B syllables make up approximately half the lexicon.

In fact, one could explain the relationship between 示 *shì* ‘show (v.)’ and 視 *shì* ‘look, see’ by arguing that \*s- was prefixed to 視 \**gijʔ* after initial \*g- had palatalized to \**dzy-*, not before. Baxter & Sagart (2012:46-47) note that the palatalization of velars (a regular part of their system) occurred as the first change, independent of the presence of \*s-; i.e. they propose:

(16) 示 \*s-*gijʔ*-s > \*s-*dzyijʔ*-s > \*z-*dzyijʔ*-s > \**zyijʔ*-s > *zyijH*

(17) 收 \*s-*kiw* > \*s-*tsyiw* > *syuw*

(18) 翹 \*s-*k<sup>h</sup>e-s* > \*s-*tsyhe-s* > *syeH*

If we suppose that \*s- was not attached in these forms until after palatalization had occurred, we can explain the very small number of occurrences of \*s-K- in the system as spurious reconstructions.

To put it another way, the distribution of \*s- before labials and velars is so limited as to seem unnatural. Either there are many more examples which have for some reason gone undetected, or the few apparent examples are not really examples at all, and

<sup>30</sup> Sagart & Baxter (2012:46) state that 收 *shōu* ‘collect; harvest’ probably has root 糾 *jiū* < \**k<r>iwʔ* ‘plait, unite’, but it is not clear if this is a causative derivation.

should be reconstructed differently.

The distributional restriction of prefix \*s- seen in Baxter & Sagart's system is not a general feature of TB languages. It is therefore unlikely that such a restriction could have been inherited from PST. We can suggest at least two explanations. First, that the restriction was not really present in Old Chinese, but reflects a systemic flaw in Baxter & Sagart's reconstruction system. (Perhaps the function and distribution of \*s- and \*N- are quite different from what Baxter & Sagart suppose, and some of the pairs of words in Table 1 involve a causativizing \*s-. This would restore \*s-K- clusters to the system.) Second, that the restriction developed in the history of Old Chinese as a result of phonological changes.

## 6. Conclusion

I would like to make some tentative suggestions for explaining the voicing alternation phenomena in Old Chinese in a way somewhat different from that taken by either Sagart or Mei.

There seems to be no definitive direct evidence for the existence of an \*s- prefix in the alternating verb pairs of the type seen in Table 1. Mei's (2009, 2012) conclusion is based on analogical reasoning, extending the reconstruction of \*s- before resonants (as in *xuè* 威) to other environments. Gong's (2001) reconstructions are in some cases based on the presence of *s-* in Written Tibetan cognates, but in these cases evidence beyond Tibetan is lacking, so that it is difficult to reconstruct \*s- in those particular lexical items at the PTB or PST stages. Since *s*-prefixation was a productive process in Chinese, Tibetan, and many other TB languages, and since we do not find a reliable correspondence of WT *s-* to OC \*s-, the comparative evidence cited by Gong cannot be taken as direct evidence for specific instances of OC \*s-. Nor do the Middle Chinese reflexes of Set A words constitute direct evidence for \*s-, since there are many plausible phonological sources for the Middle Chinese voicing alternation. So while Chinese and Tibeto-Burman morphological patterns suggest the *possibility* that \*s- is involved in Set A/Set B alternations, they do not convincingly establish it.

It therefore seems that, at least at the later stages of Old Chinese, the explanation offered by Sagart is more convincing. We have direct evidence for \*N- in a number of lexical items. But that is not necessarily the end of the story, especially given the oddities of the distribution of \*s- in the Baxter-Sagart system.

Although the exact distribution of \*s- across phonological environments may not be as restricted as currently implied by Baxter & Sagart's reconstruction system, it does seem likely that some co-occurrence constraints contingent on place or manner of articulation existed in Old Chinese. If \*N- and \*s- were restricted to occurrences in

overlapping but different environments, then it seems entirely possible that whatever semantic distinctions originally existed between  $*\text{ROOT}_1 \sim *N\text{-ROOT}_1$  alternations and  $*s\text{-ROOT}_2 \sim *ROOT_2$  alternations may have been partially neutralized, since for some verb roots only one choice of prefixation type may have been available because of phonologically-determined co-occurrence restrictions. This in turn would have led to a situation in which  $*s\text{-}$  and  $*N\text{-}$  ended up being applied for equivalent (but opposite) purposes to verb roots having different semantics and/or initial consonant types.<sup>31</sup> These ongoing productive morphological processes would have co-existed with frozen remnants of earlier paradigms involving  $*s\text{-}$  and/or  $*N\text{-}$  involving slightly different semantics or reflexes of phonotactic combinations that had later become disallowed.

And we cannot discount the further possibility that, by analogy, at a late stage voicing alternation alone might have become a functioning paradigm, just as *qù* 去-tone derivation was a functioning paradigm even after the loss of post-coda  $*\text{-s}$  that had given rise to it.

What all this suggests is that the prefixes involved in many specific OC lexical alternations may have to be worked out on an *ad hoc* basis, taking as much direct and indirect evidence as is available into account. Morphological patterns in Tibeto-Burman, and particular lexical items in TB languages, can do no more than provide inspirations and insights for that task.

One place to begin looking for direct evidence would be with voicing alternations where the verb root has a labial or velar obstruent initial, such as *bié* 別 and *bài* 敗. This is precisely the environment in which  $*s\text{-}$  does not commonly occur in the current Baxter-Sagart system. Perhaps in this environment the sound change rules proposed by Sagart & Baxter did not hold, and instead  $*s\text{-}$  had a devoicing function, as proposed by Gong and Mei. On the other hand, it might be the case that phonotactic constraints prevented the clustering of  $*s\text{-}$  with such consonants.<sup>32</sup> In this case, we would expect  $*N\text{-}$  to be involved in all such alternations. All of these possibilities merit further exploration.

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<sup>31</sup> By ‘equivalent but opposite’ I mean relationships like ‘causativizing’ and ‘decausativizing’, ‘transitivizing’ and ‘detransitivizing’, ‘valency-increasing’ and ‘valency-decreasing’, etc.

<sup>32</sup> This seems unlikely on universal grounds. My impression is that in languages that permit *sC* clusters, grave obstruents are as commonly or more commonly occurring than are acute obstruents.

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# 上古漢語和原始漢藏語動詞清濁別義的前綴詞頭 ——再論 \*s- 與 \*N- 的構擬

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中古漢語動詞聲母清濁別義的現象，例如：“張”和“長~短”，被認為是上古音或者更早構詞現象的反映。這種清濁別義的現象，有的學者認為其上古音的來源是起濁化作用的去及物性前綴 \*N-，也有的學者認為是起清化作用的使動化前綴 \*s-。本文總結介紹來自漢語內部的證據和來自比較語言學的證據，以及學者就這兩種假設提出的最新的意見。由於這兩方面假設都不能令人完全滿意，本文作者根據以上材料進一步提出新的看法，認為上古漢語時期可能有不同的構詞過程並存，但各種詞綴不一定都同時具備構詞能力，有的到了上古時期可能已經失去了構詞能力。

關鍵詞：上古漢語形態，上古音，去及物性前綴，使及物性前綴，使動化前綴，清濁別義