The evidence for Chinese *-r

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Abstract

Starostin (1989) proposes that Old Chinese had a final *-r that later changed to *-n* (and sometimes *-j*). Baxter & Sagart (2014a) incorporate Starostin's proposal in their recent Old Chinese reconstructions. This essay attempts to assemble the evidence for Old Chinese final *-r and to elaborate an explicit notation for the relative strength of this evidence for reconstructing an *-r in particular words.

1   Introduction

Because the Chinese script does not unambiguously encode phonetic information, like all other aspects of Old Chinese phonology, the final consonants of Old Chinese are necessarily somewhat uncertain.[2] The general tack of Chinese historical phonologists is to begin by projecting the finals of Middle Chinese backward onto Old Chinese and then to make adjustments of various kinds as they seem necessary.[3] Schuessler (2009) is a convenient exemplar of the *opinio communis*; he distinguishes final *-p, *-m, *-k, *-ŋ, *-t, *-n, *-w, *-wk,

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2   Here I provide a Chinese character with a reference number from Schuessler (2009), a Middle Chinese reading using Baxter's (1992) system and an Old Chinese reading using Schuessler's (2009) system. However, I mechanically adapt the conventions of Schuessler's reconstructions to match the typographical conventions of Baxter & Sagart (2014a) to ease comparison with the latter.

3   Karlgren's (1923: 27-30) voiced stop finals (cf. Baxter 1992: 325-342) and Pulleyblank's (1977-8: 187-194) palatal finals (cf. Baxter 1994: 145, 153-155) are of historic interest only and need not distract the current discussion. Karlgren reconstructed *-r and *-n in Old Chinese (Karlgren 1933: 19-37, Schuessler 1974: 80-81); most researchers change his *-r to *-j and extend its occurrence (Schuessler 2009: 25), i.e. Karlgren's *-r and Starostin's (1989) *-r are not equivalent. Some researchers prefer to reconstruct *-l rather than *-j (e.g. Zhengzhang 2000), a rather cosmetic disagreement that has no effect on the structure of Old Chinese phonology.

and *-j.[4] Starostin (1989: 399-407) further proposes *-r, to explain connections between final *-n and final *-j, a suggestion which Baxter & Sagart (2014a and 2014b) implement in their reconstruction, but without systematically presenting the data they relied on.

In the system of Baxter & Sagart "the notation '*[X]' means 'either *X, or something else that has the same Middle Chinese reflex as *X" (2014a: 8). According to this explanation *-[r], *-[n], and *-[j] would have the same meaning, i.e. 'could either be *-r or could be *-n or *-j as the case may be'. Despite their own description of their notation, it seems likely that they intend the item in the brackets as somehow the favored option, if not, why do they write ever write *-[r], which carries the disadvantage of not predicting the Middle Chinese value? Thus, one is compelled to assume that they in fact intend a four valued hierarchy of certainty with *-r, *-[r], *-[n]/*-[j] and *-n/*-j as the possible setting on a scale from 'there is certainly an *-r' to 'there is certainly not an *-r'. This notation has several disadvantage. It obscures the evidence base upon which Baxter & Sagart reached their decisions. Also, these four tiers of confidence obscure the fine-grained and complex evidence available for the readings of various characters. Here I attempt to rectify these disadvantages in the Baxter & Sagart system. I do so by assessing the data which Baxter & Sagart provide as systematically as I am able, with particular attention to establishing the relative confidence with which final *-r may be presumed in readings of particular characters, and proposing a notation that transparently expresses the fine-grained confidence levels inherent in the data. The notation proposed here is an improvement on the notation of Baxter & Sagart; I commend it for all ends which their reconstructions serve.

Evidence for *-r divides into two types, (1) direct evidence for *-r readings of specific characters, and (2) indirect evidence, which links the characters for which there is direct evidence to further characters for which there is no direct evidence.

2   Direct evidence of *-r

Three types of evidence pertain to the reconstruction of final *-r in the reading of a particular character: (1) explicit discussion in traditional literature of alternative -*n* and -*j* pronunciations of a word, (2) the mixture of Middle Chinese -*n* and -*j* readings of a single

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4   I omit from this list final *-h, *-s, and *-ʔ which are needed to explain the origin of tone in Middle Chinese, but are not relevant to the current discussion of *-r.

character, (3) rhyme contact in early poetry between a word with Middle Chinese -*n* and a word with Middle Chinese -*j* readings.[5]

Each of these three types of evidence is weaker than the preceding type. (1) Because the explicit discussion in traditional literature of dialect variation in the pronunciation of specific words isolates the specific time and place of the variation, this type of evidence is the strongest.[6] (2) The mixture of Middle Chinese -*n* and -*j* readings of single characters in the *Qièyùn* 切韻 (601 CE) pertains to a much later date than discussions of dialect variation. In addition, because the *Qièyùn* does not specify variant readings as originating from particular locales, no geographic information is available about Middle Chinese -*n* and -*j* variation. (3) Rhyme contact in early poetry between a word with a Middle Chinese -*n* reading and a word with a Middle Chinese -*j* reading is more convoluted than may be obvious at first blush. Since this evidence relies on *Qièyùn* readings, it does not directly reveal anything about the pronunciation of the words in a poem at the time of its composition. Presumably in the speech of a poem's author there was no difference between the finals that would later become Middle Chinese -*n* and those that would become -*j*. The challenge of explaining such cases is not to explain the pronunciation of the original poem per se, but to explain how Middle Chinese came to have an -*n* reading in the one case and a -*j* reading in the other. By virtue of the *Ausnahmslosigkeit der Lautgesetze,* such rhymes provide evidence that both -*n* and -*j* readings of both characters involved in a relevant rhyme *could* have appeared in the *Qièyùn*; that not all such readings were transmitted is an accident of fate. If one follows the explanation of Baxter & Sagart that *-r > -*n* is the mainstream development, whereas *-r > -*j* is characteristic of an eastern dialect (2014a: 254-268), then in all cases in which Middle Chinese -*n* rhymes with Middle Chinese -*j*, the dialect(s) reflected in the *Qièyùn* could have

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5   A fourth type of evidence, namely the use of a character to transcribe foreign syllables that end in -*r*, is also relevant. However, because foreign transcriptions are not directly relevant to -*n* and -*j* alternations and their treatment gives rise to a number of complications, the present article does not address the use of foreign transcriptions as evidence for *-r.

6   One might object that because discussion of the readings of the characters in the passages that constitute the first type of evidence will inevitably make reference to the *Qièyùn*, one should regard the evidence of the *Qièyùn* itself (i.e. the second type of evidence) as more secure then evidence of the first type. However, in evidence of the first type, it is the texts themselves and not the *Qièyùn*, that posit distinct readings; epistemologically reference to the *Qièyùn* is unnecessary. In contrast, as is discussed presently, rhyme contact between -*n* and -*j* in early poetry must make reference to the *Qièyùn* and is consequently a less secure source of evidence.

replaced the inherited -*n* reading with an eastern -*j* borrowing and could have failed to borrow the -*j* reading, instead retaining inherited -*n*. Because this third type of evidence implies the possibility of the second type of evidence, evidence of the third type is necessarily weaker than evidence of the second type.

As a notational convention it is convenient to distinguish these three forms of evidence as a, b, c, and to note these letters as a superscript ([a], [b], [c]) to indicate what evidence supports the reconstruction of final *-r in a given word. For example, the character 桓 (25-12f) *hwan* < *wˤan is glossed by a third century scholar as pronounced as 和 (19-07e) *hwa* < *wˤaj (Baxter & Sagart 2014a: 266); the Old Chinese reconstruction can make explicit this source of evidence for *-r by writing 桓 *hwan* < *wˤar[a]. Similarly, since the character 洒 (26-31g) has Middle Chinese readings *sejX* and *senX*, it may be represented in Old Chinese as 洒 *sˤirʔ[b]. In Ode 215 難 (24-35d) *nan* < *nˤan 'difficult' rhymes with 那 (18-12a) *na* < *nˤaj 'much', so the Old Chinese reconstructions of 難 and 那 can make explicit this source of evidence for *-r by writing 難 *nˤar[c] and 那 *nˤar[c].

3 Indirect evidence of *-r

In addition to the three types of direct evidence pertaining to the reconstruction of final *-r for a particular word (i.e. the reading of a particular character), there exist two types of indirect evidence also suggestive of final *-r in words for which direct evidence is lacking. First, a character may have 諧聲 *xiéshēng* contacts with a character with readings for which there is direct evidence for final *-r. Second, a word written with a character that has a Middle Chinese readings in -*n* may rhyme with another word (also written with a character that has a Middle Chinese reading in -*n*), for which there is direct evidence of final *-r.

The relationship of *xiéshēng* series membership is transitive (i.e. if 蕃 is in the same series as 播 and 播 is in the same series as 譒 then 蕃 is in the same series as 蟠). Thus, if 桓 *hwan* is reconstructed *wˤar[a] on the basis of it being glossed as 和 (19-07e) *hwa* < *wˤaj, then, according to the '*xiéshēng* hypothesis',[7] any character built on the phonetic 亘 probably

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7 Duàn Yùcái 段玉裁 (1735-1815) first elaborated the principle that the same phonetic component in the writing of two characters implies the words expressed by these characters have the same rime category in the *Shījīng* 詩經 (cf. Li 1974: 221). Li Fang-kuei 李方桂 adds the stipulation that each Old Chinese rime category have one vowel (Li 1974: 243, Baxter 1992: 348, Schuessler 2009: 11). For characters that do not occur as rhyme words in the *Shījīng* this principle is necessarily an assumption, but for words represented by

had the rhyme *-ar in Old Chinese. Such cases of *xiéshēng* links to characters with *-r[a] readings may be represented as [A], using the capital letter to reflect the more abstract nature of the evidence. In the same way [C] may mean that the reading in question has a *xiéshēng* connection to a word that rhymes in a way that implies *-r, either a Middle Chinese -*n* word that rhymes with a -*j* word or vice versa.

The notation [B] by analogy would mean a reading that has *xiéshēng* connection to a character with both -*n* and -*r* readings, e.g. since 洒 (26-31g) has Middle Chinese readings *sejX* and *senX*, the Old Chinese reconstruction of 哂 *syinX* (26-31i) could be written *ŋ̊ər[B]ʔ. However, using [B] exclusively for such cases would leaves no way to express the cases in which a *xiéshēng* series contains both -*n* and -*j* readings, but where no single character has both, e.g. 難 *nan* (24-35g) has an -*n* reading and 儺 *na* < *nˤaj (24-35k) has a -*j* reading, but no single character in series 24-35 has both -*n* and -*j* readings. Consequently, I propose to use [B] to mark all readings of all characters in a series that contains -*n* and -*j* readings whether of the type seen in series 26-31 (洒哂 etc.) or in series 24-35 (難儺 etc.).[8]

Unlike *xiéshēng* contact, rhyme contact is not transitive. If A rhymes with B and B with C, it is quite possible that A does not rhyme with C. If great philological care is not taken, the use of rhyme evidence would quickly lead to the presumption that all cases of Middle Chinese -*n* and -*j* descend from *-r (List forthcoming). The use of superscript numerals

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characters that are in the same *xiéshēng* series and also occur as rhyme words in the *Shījīng* whether or not the readings of these characters rhyme is a testable hypothesis. There are many such cases. For example, 拮 *ket* < *kˤit (29-01q) and 襭 *het* < *gˤit (29-01y) rhyme in Ode 8.3 and 脫 *thwajH* < *l̥ˤots (22-13m) and 帨 *sywejH* < *l̥ots (22-13g) in Ode 23.3. Such examples probably led Duàn Yùcái to formulate his theory.

8   It is not reasonable to presume that all words that are written with characters in a *xiéshēng* series that shows contact between -*n* and -*j* had a final *-r. For example, series 06-38 (匕) contains only one character that has a reading with final -*n*, namely 牝 (26-38i) *bjinX*, and this character also has the reading *bjijX*. Since *-r > -*j* is a minority development, characteristic of eastern dialects (Baxter & Sagart 2014a: 264-271), the chances of an entire *xiéshēng* series reflecting this change is very small. Instead, it is safer to presume that only the word written with the character 牝 is to be reconstructed with a final *-r. One may suppose, for example, that a speaker of an Eastern dialect first used this character to write this word in the pronunciation ancestral to *bjijX*, but that as this orthography became established speakers of Western dialects, saying something ancestral to *bjinX*, also took up the practice. Nonetheless, such late readings do nothing to challenge the transitivity of *xiéshēng* series membership per se. All characters built on 匕 are members of the same series and the reading 牝 *bjinX* is *prima facie* evidence for *-r in the reading of any of the other characters in the series.

conveniently captures the non transitive nature of the rhyme evidence. For example, if 泉 (25-40a) *dzjwen* < *dzwan 'spring, source' is thought likely to have final *-r because in Ode 197 it rhymes with 垣 (25-12m) *hjwon* < *wan 'wall' and the latter is in a *xiéshēng* series that also contains the character 桓 *hwan* which is glossed with 和 (19-07e) *hwa* < *wˤaj this evidence can be noted 泉 *dzwar^{A²}. Turning to another example of representing indirect rhyme evidence, in Ode 250 the words written 原 (25-20a) *ngjwon* < *ŋwan 'spring, source; origin' rhymes with both 宣 (25-12t) *sjwen* < *swar^A 'spread (v.)' (^A again because of 桓 [25-12f] *hwan* < *wˤar^a) and 歎 (24-35c) *than* < *ŋˤar^B 'to sigh' (^B because of contacts such as [24-35g] *nan* and 儺 [24-35k] *na* < *nˤaj). Consequently, 原 (25-20a) *ngjwon* may itself be reconstructed *ŋʷar^{A²B²}.

The notational conventions are now in place for keeping track of the strength of evidence for *-r in the reading of particular characters. The discussion proceeds to a presentation of the evidence belonging to each type (three direct and two indirect) and the calculation of the strength of evidence for *-r in particular characters.

4 Direct evidence in detail

4.1 (a) Explicit discussions of alternate pronunciations of a word

Baxter & Sagart (2014a: 264-267) cite evidence from discussions by early Chinese writers suggesting the need to reconstruct the readings of three characters with final *r. By way of example, in his commentary on *Lǚshì Chūn-qiū* 呂氏春秋, the late Hàn commentator Gāo Yòu 高誘 (fl . 205–212) writes:

> 今兗州人謂殷氏皆曰衣
> "Nowadays the people of Yǎnzhōu 兗州 all pronounce the family name 殷 Yīn
> [*ʔər] as 衣 Yī [*ʔ(r)əj]" (Baxter & Sagrat 2014: 265).

Baxter & Sagart (2014a: 264-267) provide three cases of explicit discussions of dialect pronunciations:

> 殷 (33-09a) *ʔjin* < *ʔən pronounced as 衣 (27-05a) *ʔjij* < *ʔəj
> 桓 (25-12f) *hwan* < *wˤan pronounced as 和 (19-07e) *hwa* < *wˤaj

癬 (23-21d) *sjenX* < *senʔ[9] 'ringworm' pronounced as 徙 (07-28a) *sjeX* < *seʔ[10]
'move (to)'

This evidence permits the reconstructions 殷 *ʾjin* < *ʔərᵃ, 桓 *hwan* < *wˤarᵃ, and 癬 *sjenX* < *serᵃʔ and all readings in the series 33-09 (殷), 25-12 (亘), and 23-21 (鮮) can be reconstructed with *-rᴬ.

4.2 (b) Characters with both -n and -j readings in Middle Chinese

The following characters have both *-n* and *-j* (or ∅ < *-j) readings, which permits their reconstruction with final *-rᵇ and all readings of characters in their series with *-rᴮ.

19-02l 輠 *hwaeX, hwanX, hwojX*
24-17e 獻 *sa, xjonH*
24-21l 癉 *tanX, taH*
24-54b 番 *pa, phjon*
25-32a 卵 *lwaX, lwanX*
26-31g 洒 *sejX, senX*
26-38i 牝 *bjijX, bjinX*
33-02l 圻 *ngjɨn, gjɨj*
    m 頎 *khonX, gjɨj*
33-25i 姺 *sejX, senX*
33-25j 洗 *sejX, senX*
33-29a 賁 *pwon, pjeH*
34-18g 錞 *dwojH, dzywin*
    h 鐓 *dwojH, dzywin*
    p 敦 *twoj, twon*
    r 焞 *thwoj, thwon*
34-23f 捘 *tswojH, tswonH*

Baxter & Sagart (2014a: 283) also argue for a final *-r in the word 短 (10-16a) *twanX*, 'short' because Ptoto-Mǐn *toi B 'short' (on the basis of forms such as Fúzhōu /tøi 3/ and Amoy /te 3/) suggests final *-j. As in the case of rhyme contact between *-n* and *-j* one might see this Mǐn evidence as arguing that there *could* have been a reading 短 *twaX < *twajX in the

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9 Baxter & Sagart (2014b) reconstruct with the main vowel *-a-.
10 Baxter & Sagart (2014b) reconstruct with the rime *-aj.

Qièyùn, had fate not intervened. Outside of a systematic comparison of Middle Chinese with Proto-Mǐn this use of Mǐn data to argue for *-r remains merely suggestive and will not receive further consideration here.

4.3 (c) Rhyme contact among words with final -n and -j

Baxter & Sagart (2014a: 257, 262) mention a number of cases in which words that end with *-n* rhyme directly with words that end with *-j*.[11]

Ode 43.1:

泚 (07-25h) *tsʰeʔ > *tshjeX*
瀰 (07-20o) *meʔ > *mjieX*
鮮 (23-21a) *sen > *sjen*

Ode 137.2:[12]

差 (18-13f) *tsʰˤraj > *tsrhea*
原 (25-20a) *ŋʷan > *ngjwon*
麻 (18-18a) *mˤraj > *mae*
娑 (18-15e) *sˤaj > *sa*

Ode 215.3:

翰 (24-02f) *gˤans > *hanH*
憲 (24-18a) *ŋ̊ans > *xjonH*
難 (24-35d) *nˤan > *nan*
那 (18-12a) *nˤaj > *na*

Ode 222.2 (cf. 299.1):

芹 (33-02f) *gən > *gjɨn*
旂 (33-02p) *gəj > *gjɨj*

Ode 259.7:

番 (24-54b) *pˤaj > *pa*

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11 A search through other early rhyming texts would surely yield further examples; I am currently engaged in such a search and hope to report relevant findings on a later occasion.

12 Baxter & Sagart (2014a: 266) understand Ode 137 as evidence only that 原 *ngjwon* ended with *-r. They point out that this poem is from the 陳風 Chén fēng section of the *Shījīng*, traditionally held to contain poems hailing from 陳 Chén, a region they regard as within the area that underwent the *ar > *-aj isogloss (Baxter & Sagart 2014a: 266). To avoid prejudicing the investigation, I treat Ode 137 like all others.

單 (24-21m) *tʰˤan > *than*

翰 (24-02f) *gˤans > *hanH*

憲 (24-18a) *ŋ̊ans > *xjonH*

Ode 299.1 (cf. 222.2):

芹 (33-02f) *gən > *gjin*

旂 (33-02p) *gəj > *gjɨj*

Zhōuyì 周易 (Baxter & Sagart 2014a: 259-260)

皤 (24-54r) *bˤaj > *ba*

翰 (24-02f) *gˤans > *hanH*

Zuǒzhuàn 左傳 (4th c. BCE), Duke 僖 Xī, year 5 (Baxter & Sagart 2014a: 255):[13]

辰 (33-13a) *dən > *dzyin*

振 (33-13p) *tən > *tsyin*

旂 (33-02p) *gəj > *gjɨj*

賁 (33-29a) *pˤwən > *pwon*

焞 (34-18r) *tʰˤwən > *thwon*

軍 (34-13a) *kwən > *kjun*

奔 (33-28a) *pˤwən > *pwon*

This evidence permits the reconstruction of the characters 灑 (07-20o) *mjieX*, 泚 (07-25h) *tshjeX*, 那 (18-12a) *na*, 娑 (18-15e) *sa*, 麻 (18-18a) *mae*, 差 (18-13f) *tsrhea*, 鮮 (23-21a) *sjen*, 翰 (24-02f) *hanH*, 憲 (24-18a) *xjonH*, 單 (24-21m) *than*, 難 (24-35d) *nan*, 番 (24-54b) *pa*, 皤 (24-54r) *ba*, 原 (25-20a) *ngjwon*, 芹 (33-02f) *gjin*, 旂 (33-02p) *gjɨj*, 辰 (33-13a) *dzyin*, 振 (33-13p) *tsyin*, 奔 (33-28a) *pwon*, 賁 (33-29a) *pwon*, 軍 (34-13a) *kjun*, and 焞 (34-18r) *thwon* with final *-rᶜ and the reconstruction of the series 07-20 (爾), 07-25 (此), 18-12 (那), 18-15 (沙), 18-18 (麻), 18-13 (左), 23-21 (鮮), 24-02 (倝), 24-18 (憲), 24-21a (單), 24-35 (嘆), 24-54 (采), 25-20 (原), 33-02 (斤), 33-13 (辰), 33-28 (奔), 33-29 (賁), 34-13 (軍), and 34-18 (敦) with the final *-rᶜ.

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13 I follow Baxter & Sagart's proposal that the text is "late enough that original *-ur has already diphthongized to *-wər" (2014a: 255), and simplify the presentation accordingly. The effected words are 賁 *pˤur > *pˤwər > *pwon*, 焞 *tʰˤur > *tʰˤwər > *thwon*, 軍 *kʷər > *kwər > *kjun*, and 奔 *pˤur > *pˤwər > *pwon*. Behr (2008: 492) also points to this passage and he adds 晨 at the beginning, i.e. he sees the rhyming pattern as extending somewhat longer than Baxter & Sagart do.

5 Indirect evidence

5.1 Xiéshēng *connections*

The *xiéshēng* series 07-20 (爾), 24-35 (嘆), 25-16a (丸) *hwan* and 25-24a (耑) appear not to contain individual characters with both *-j* and *-n* readings, but instead contain both characters with *-n* readings and characters with *-j* (or ∅ < *-j) readings. Readings of characters appearing in these series may be reconstructed with *-r^B.

07-20a 爾 *nyeX*
07-20k 鑭 *sjenX*

24-35g   *nan*
24-35k 儺 *na*

25-16a 丸 *hwan*
25-16e 骫 ʾ*jweX*

25-24a 耑 *twan*
25-24p 瑞 *dzyweH*

5.2 Rhyme contacts

Baxter & Sagart (2014a: 258, 295) mention the following examples of a word written with a character that has a Middle Chinese readings in *-n* rhyming with another word (also written with a character that has a Middle Chinese reading in *-n*), in which the latter character has direct evidence of final *-r.

Ode 5.1:
    詵 (33-25n) *srər^B > *srin*
    振 (33-13p) *tər^c > *tsyin*
Ode 49.2:
    奔 (33-28a) *p^{ˤ}ər^c > *pwon*[14]

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14 It is also possible to see 鷐之奔 *dur *tə *p^{ˤ}ur > *dzywin tsyi pwon* in 49.1 and 49.2 as intentional line

君 (34-12a) *kʷən > *kjun*

Ode 69.1:

乾 (24-02c) *kˤarᶜ > *kan*

歎 (24-35c) *n̥ˤarᴮ > *than*

難 (24-35d) *nˤarᶜ > *nan*

Ode 73.2:

啍 (34-18t) *tʰurᶜᴮ > *thwon*

璊 (24-57f) *mˤən > *mwon*

奔 (33-28a) *pˤərᶜ > *pwon*

Ode 197.8:

山 (24-45a) *srˤan > *srean*

泉 (25-40a) *dzwan > *dzjwen*

垣 (25-12m) *warᴬ > *hjwon*

Ode 250.2:

原 (25-20a) *ŋʷarᶜ > *ngjwon*

繁 (24-52b) *ban > *bjon*

宣 (25-12t) *swarᴬ > *sjwen*

歎 (24-35c) *n̥ˤarᴮ > *than*

巘 (24-17h) *ŋarᴮ > *ngjenX*

原 (25-20a) *ŋʷarᶜ > *ngjwon*

Ode 254.7:

蕃 (24-54m) *parᴮᶜ > *pjon*

垣 (25-12m) *warᴬ > *hjwon*

翰 (24-02f) *gˤarᶜs > *hanH*

Ode 259.1:

翰 (24-02f) *gˤarᶜs > *hanH*

蕃 (24-54m) *parᴮᶜ > *pjon*

宣 (25-12t) *swarᴬ > *sjwen*

Ode 244.4:

垣 (25-12m) *warᴬ > *hjwon*

翰 (24-02f) *gˤarᶜs > *hanH*

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internal rhyming, but this possibility is not further pursued here.

Ode 254.7:

藩 (24-54s) *parᴮᶜ > *pjon*

垣 (25-12m) *warᴬ > *hjwon*

翰 (24-02f) *gˤarᶜs > *hanH*

Ode 259.1:

翰 (24-02f) *gˤarᶜs > *hanH*

蕃 (24-54m) *parᴮᶜ > *bjon*

宣 (25-12t) *swarᴬ > *sjwen*

Ode 262.4:

宣 (25-12t) *swarᴬ > *sjwen*

翰 (24-02f) *gˤarᶜs > *hanH*

Ode 263.5:

嘽 (24-21m) *tʰˤarᶜ > *than*

翰 (24-02f) *gˤarᶜs > *hanH*

漢 (24-10c) *n̥ˤans > *xanH*

Chǔcí 楚辭, Jiǔ biàn 九變 (3rd c. BCE) (Baxter & Sagart 2014a: 260):

乾 (24-02c) *kˤarᶜ > *kan*

歎 (24-35c) *n̥ˤarᴮ > *than*

Ode 254.1

癉 (24-21l) *tˤarᵇʔ > *tanX*

板 (24-49j) *prˤanʔ > *paenX*

諫 (23-07b) *krˤans > *kaenH*

亶 (24-23a) *tˤanʔ > *tanX*

然 (24-36a) *nan > *nyen*

管 (25-01h) *kʷanʔ > *kwanX*

遠 (25-15f) *wanʔ > *hjwonX*

The *Jīngdiǎn shìwén* 經典釋文 and the received version of the *Lǐjì* 禮記 both offer 驒 (24-23-) in place of 癉 (24-21l) in citing Ode 254. A bamboo version of the *Lǐjì* excavated at Guōdiàn 郭店 writes this word with 担 (24-22-). The characters 驒 (24-23-) and 担 (24-22-) belong to the series built on 旦 (24-22/24-23),¹⁵ like 亶 *tanX* (24-23a), which is also a rhyme word in this poem (Baxter & Sagart 2014a: 259). I accept the explanation of 癉 (24-21l) as a

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15 Baxter & Sagart (2014a: 259) combine series 24-22 and 24-23.

textual corruption in this poem and do not take it as evidence of *-r in the words it rhymes with.

The calculation of the superscripts is unglamorous. Rhyme-derived superscript notation for those characters that have other evidence of final *-r previously discussed, is deferred to the conclusion. Those characters for which rhymes provides the first, indirect, evidence of final *-r are: 漢 *xanH* < *$\text{*ŋ̊}^\text{ˤ}\text{ar}^{2c^2}\text{s}$ (24-10c), 山 *srean* < *$\text{*sr}^\text{ˤ}\text{ar}^{A^2}$ (24-45a), 繁 *bjon* < *$\text{*bar}^{2c^2A^22B^2}$ (24-52b), 璊 *mwon* < *$\text{*m}^\text{ˤ}\text{ər}^{c^2C^2B^2}$ (24-57f), 泉 *dzjwen* < **dzwar^{A^2} (25-40a), 君 *kjun* < *$\text{*k}^\text{w}\text{ər}^{c^2}$ (34-12a).

6 Conclusions

Here follows a list of reconstructions of specific characters ordered according to strength of the evidence for *-r. The reconstructions of Baxter & Sagart (2014b) are provided in braces for reference. As explained above, despite their explanation to the contrary, the reconstruction of Baxter & Sagart distinguishes four levels of confidence in the reconstruction of *-r which they notate respectively *-r, *-[r], *-[n]/*-[j], and *-n/*-j. The confidence levels calculated here are not parallel with the confidence levels they arrive at. They reconstruct a confident *-r even for words such as 山 (24-45a) *srean* < *$\text{*sr}^\text{ˤ}\text{ar}^{A^2}$ {*s-ŋrar} and 泉 (25-40a) *dzjwen* < **dzwar^{A^2} {*s-N-ɢʷar}, where the evidence for *-r is quite indirect. There are also cases where they are skeptical of a final -r, even though the confidence calculation made here is quite high, e.g. 沘 (07-25h) *tshjeX* < *$\text{*tsh}^\text{h}\text{er}^\text{c}$ʔ {*[tsʰ]e(j)ʔ} and 娑 (18-15e) *sa* < *$\text{*s}^\text{ˤ}\text{ar}^\text{c}$ {*[s]ˤa[j]}. However, such instances of disagreement with the confidences presented here underline the need for further careful scrutiny of the evidence base upon which *-r is proposed. Given the current state of knowledge, the direct use of Baxter & Sagart's reconstructions of *-r in comparative studies (e.g. as in Hill 2014) is premature.

桓 (25-12f) *hwan* < *$\text{*w}^\text{ˤ}\text{ar}^\text{a}$ {*[ɢ]ʷˤar}
癬 (23-21d) *sjenX* < **ser^aʔ {*[s]arʔ}
殷 (33-09a) *ʼjin* < **ʔər^a {*ʔˤrə[r]}
番 (24-54b) *pa* < *$\text{*p}^\text{ˤ}\text{ar}^\text{bc}$ {*pˤar}, *phjon* < *$\text{*p}^\text{h}\text{ar}^\text{b}$ {*pʰˤar}
賁 (33-29a) *pwon* < *$\text{*p}^\text{ˤ}\text{ər}^\text{bc}$ {*pˤur}, *pjeH* < **par^bs {*por-s}
焞 (34-18r) *thwoj, thwon* < *$\text{*th}^\text{h}\text{ur}^\text{bc}$ {*tʰˤur}
輠 (19-02l) *hwaeX* < *$\text{*g}^\text{ˤ}\text{ror}^\text{b}$ʔ {*[g]ˤ<r>orʔ}, *hwanX* < **gor^bʔ {*[g]ˤorʔ}, *hwojX* <

gˤurᵇʔ {[g]ˤurʔ}

獻 (24-17e) *sa* < *sŋˤarᵇ {*s-ŋˤar},[16] *xjonH* < *ŋ̊arᵇs {*ŋ̊ar-s}

卵 (25-32a) *lwaX, lwanX* < *rˤorᵇʔ {*k.rˤorʔ}

洒 (26-31g) *sejX, senX* < *sˤirᵇʔ {*[s]ˤərʔ}

牝 (26-38i) *bjijX, bjinX* < *birᵇʔ {*[b]irʔ}

圻 (33-02l) *ngjin* < *ŋərᵇ {*[ŋ]ər}, *gjij* < *gərᵇ

癉 (24-21l) *tanX* < *tˤarᵇʔ {*tˤanʔ}, *taH* < *tˤarᵇs

頒 (33-02m) *khonX* < *kʰˤərᵇʔ, *gjij* < *gərᵇ

姺 (33-25i) *sejX, senX* < *sˤərᵇʔ {*[s]ˤərʔ}

洗 (33-25j) *sejX, senX* < *sˤərᵇʔ {*[s]ˤərʔ}

錞 (34-18g) *dwojH* < *dˤurᵇs, *dzywin* < *durᵇ

鐓 (34-18h) *dwojH* < *dˤurᵇs, *dzywin* < *durᵇ

敦 (34-18p) *twoj, twon* < *tˤurᵇ {*tˤur}

捘 (34-23f) *tswojH, tswonH* < *tsˤurᵇs

翰 (24-02f) *hanH* < *gˤarᶜᶜ²⁵ᴬ²⁴ᴮ²⁴ᶜ²s {*[g]ˤar}

嘽 (24-21m) *than* < *tʰˤarᶜᶜ² {*tʰˤar}

原 (25-20a) *ngjwon* < *ŋʷarᶜᴬ²²ᴮ² {*N-ɢʷar}

難 (24-35d) *nan* < *nˤarᶜᴮ²ᶜ² {*nˤar}

奔 (33-28a) *pwon* < *pˤərᶜᴮ²ᶜ² {*pˤur}

振 (33-13p) *tsyin* < *tərᶜᴮ² {*tər}

瀰 (07-20o) *mjieX* < *merᶜʔ {*m.ner}

泚 (07-25h) *tshjeX* < *tsʰerᶜʔ {*[tsʰ]e(j)ʔ}

那 (18-12a) *na* < *nˤarᶜ {*nˤar}

娑 (18-15e) *sa* < *sˤarᶜ {*[s]ˤa[j]}

麻 (18-18a) *mae* < *mˤrarᶜ {*C.mˤraj}

差 (18-13f) *tsrhea* < *tsʰˤrarᶜ {*tsʰraj}

鮮 (23-21a) *sjen* < *serᶜ {*[s][a]r}

憲 (24-18a) *xjonH* < *ŋ̊arᶜs {*qʰar-s}

嶓 (24-54r) *ba* < *bˤarᶜ {*[b]ˤar}

芹 (33-02f) *gjin* < *gərᶜ {*C.[ɢ]ər}

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16 Schuessler (2009) does not include the reading 獻 (24-17e) *sa*, but does reconstruct *sŋ- in series with
  similar patterns (e.g. 21-11 on p. 232).

旅 (33-02p) *gjij* < *gər^c {*C.[ɢ]ər}

辰 (33-13a) *dzyin* < *dər^c {*[d]ər}

軍 (34-13a) *kjun* < *kʷər^c {*[k]ʷər}

垣 (25-12m) *hjwon* < *war$^{A3c^2B^2C^2}$ {*[ɢ]ʷar}

宣 (25-12t) *sjwen* < *swar$^{A4c^2 4B^2C^2}$ {*s-qʷar}

㵎 (24-17h) *ngjenX* < *ŋar$^{Bc^2A^2B^2}$ {*ŋ(r)ar}

歎 (24-35c) *than* < *n̥ˤar$^{B2c^2A^2B^22C^2}$ {*n̥ˤar}

蕃 (24-54m) *bjon* < *par$^{BC3c^2 2A^2}$ {*par}

藩 (24-54s) *pjon* < *par$^{BCc^2A^2}$ {*[b]ar}

啍 (34-18t) *thwon* < *tʰur$^{BCc^2}$

詵 (33-25n) *srin* < *srər$^{Bc^2}$ {*srər}

乾 (24-02c) *kan* < *kˤar$^{Cc^2 2B^2}$ {*[k]ˤar}

繁 (24-52b) *bjon* < *bar$^{2c^2A^2 2B^2}$ {*[b]ar}

璊 (24-57f) *mwon* < *mˤər$^{c^2C^2B^2}$ {*mˤur}

漢 (24-10c) *xanH* < *n̥ˤar$^{2c^2}$s {*n̥ˤar-s}

君 (34-12a) *kjun* < *kʷər$^{c^2}$ {*C.qur}

山 (24-45a) *srean* < *srˤar$^{A^2}$ {*s-ŋrar}

泉 (25-40a) *dzjwen* < *dzwar$^{A^2}$ {*s-N-ɢʷar}

A list of the reconstructions of specific characters ordered according to the numbering of Schuessler (2009) is perhaps a convenience to the reader.

瀰 (07-20o) *mjieX* < *mer^{c}ʔ

泚 (07-25h) *tshjeX* < *tsʰer^{c}ʔ

那 (18-12a) *na* < *nˤar^c

娑 (18-15e) *sa* < *sˤar^c

麻 (18-18a) *mae* < *mˤrar^c

差 (18-13f) *tsrhea* < *tsʰˤrar^c

輠 (19-02l) *hwaeX* < *gˤror^{b}ʔ, *hwanX* < *gor^{b}ʔ, *hwojX* < *gˤur^{b}ʔ

鮮 (23-21a) *sjen* < *ser^c

癬 (23-21d) *sjenX* < *ser^{a}ʔ

乾 (24-02c) *kan* < *kˤar$^{Cc^2 2B^2}$

翰 (24-02f) *hanH* < *gˤar$^{cc^2 5A^2 4B^2 4C^2}$s

漢 (24-10c) *xanH* < *n̥ˤar$^{2c^2}$s

獻 (24-17e) *sa* < *s-ŋˤar^{b}, *xjonH* < *ŋ̊ar^{b}s

巘 (24-17h) *ngjenX* < *ŋar$^{Bc^2A^2B^2}$

憲 (24-18a) *xjonH* < *ŋ̊ar^{c}s

癉 (24-21l) *tanX* < *tˤar^{b}ʔ, *taH* < *tˤar^{b}s

嘽 (24-21m) *than* < *tʰˤar$^{cc^2}$

歎 (24-35c) *than* < *n̥ˤar$^{B2c^2A^2B^22C^2}$

難 (24-35d) *nan* < *nˤar$^{cB^2C^2}$

山 (24-45a) *srean* < *srˤar$^{A^2}$

繁 (24-52b) *bjon* < *bar$^{2c^2A^22B^2}$

番 (24-54b) *pa* < *pˤar^{bc}, *phjon* < *pʰar^{b}

蕃 (24-54m) *bjon* < *par$^{BC3c^22A^2}$

幡 (24-54r) *ba* < *bˤar^{c}

藩 (24-54s) *pjon* < *par$^{BCc^2A^2}$

璊 (24-57f) *mwon* < *mˤər$^{c^2B^2C^2}$

桓 (25-12f) *hwan* < *wˤar^{a}

垣 (25-12m) *hjwon* < *war$^{A3c^22B^22C^2}$

宣 (25-12t) *sjwen* < *swar$^{A4c^24B^22C^2}$

原 (25-20a) *ngjwon* < *ŋʷar$^{cA^22B^2}$

卵 (25-32a) *lwaX, lwanX* < *rˤor^{b}ʔ

泉 (25-40a) *dzjwen* < *dzwar$^{A^2}$

洒 (26-31g) *sejX, senX* < *sˤir^{b}ʔ

牝 (26-38i) *bjijX, bjinX* < *bir^{b}ʔ

圻 (33-02l) *ngjin* < *ŋər^{b}, *gjij* < *gər^{b}

芹 (33-02f) *gjin* < *gər^{c}

頎 (33-02m) *khonX* < *kʰˤər^{b}ʔ, *gjij* < *gər^{b}

旂 (33-02p) *gjɨj* < *gər^{c}

殷 (33-09a) *ʾjin* < *ʔər^{a}

辰 (33-13a) *dzyin* < *dər^{c}

振 (33-13p) *tsyin* < *tər$^{cB^2}$

姺 (33-25i) *sejX, senX* < *sˤər^{b}ʔ

洗 (33-25j) *sejX, senX* < *sˤər^{b}ʔ

詵 (33-25n) *srin* < *srər$^{Bc^2}$

奔 (33-28a) *pwon* < *pˤər$^{cB^2C^2}$

賁 (33-29a) *pwon* < *pˤər^{bc}, *pjeH* < *par^{b}s

君 (34-12a) *kjun* < *kʷər$^{c^2}$

軍 (34-13a) *kjun* < *kʷər^c

錞 (34-18g) *dwojH* < *dˤur^{b}s, *dzywin* < *dur^b

鐓 (34-18h) *dwojH* < *dˤur^{b}s, *dzywin* < *dur^b

敦 (34-18p) *twoj, twon* < *tˤur^b

焞 (34-18r) *thwoj, thwon* < *tʰˤur^{bc}

啍 (34-18t) *thwon* < *tʰur$^{BCc^2}$

捘 (34-23fʻ) *tswojH, tswonH* < *tsˤur^{b}s

The proceeding lists do not include the many hundreds of characters for which *xiéshēng* contacts are the only evidence of *-r. Instead, this information is more conveniently presented at the level of the whole *xiéshēng* series. To do this, the system of Hill (2015) is useful. As employed here, -NR means that *-n* readings predominate in the *xiéshēng* series and -IR means that *-j* readings predominate.

07-20 (爾) NEIR^{BC}

07-25 (此) TSEIR^{C}

18-12 (那) NAIR^{C}

18-13 (左) TSAIR^{C}

18-15 (沙) SAIR^{C}

18-18 (麻) MAIR^{C}

19-02 (果) KOIR^{B}

23-21 (鮮) SENR^{AC}

24-02 (靯) KANR^{C}

24-17 (膚) ṄANR^{B}

24-18 (憲) ṄANR^{C}

24-21 (單) TANR^{BC}

24-35 (嘆) NANR^{BC}

24-54 (釆) PANR^{BC}

25-12 (亘) WANR^{A} (or QUANR^{A} according to Baxter & Sagart 2014b)

25-16 (丸) WANR^{B} (or QUANR^{B} according to Baxter & Sagart 2014b)

25-20 (原) KUANR^{C}

25-24 (嵩) TONR^B

25-32 (卵) ovo (pronounced *r^{ˤ}or^{b}ʔ)

26-31 (西) SIR (or SYIR^B according to Baxter & Sagart 2014b)

26-38 (匕) PIR^B

33-02 (斤) KYNR^{BC} (or QYNR^{BC} according to Baxter & Sagart 2014b)

33-09 (殷) YNR$^{A''}$

33-13 (辰) TYNR^C

33-25 (先) SYNR^B

33-28 (奔) PYNR^C

33-29 (賁) PYNR^{BC}

34-13 (軍) KUYNR^C

34-18 (絮) TUNR^{BC}

34-23 (允) TSUNR^B

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