Fossil nominalization prefixes in Tibetan and Chinese*

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1 Introduction

In the Trans-Himalayan family, unlike Indo-European, the morphologically most complex languages, Rgyalrong and Kiranti, are endangered languages without a written literary tradition. A growing body of evidence suggests that this complex morphology is at least in part archaic (Jacques 2012b, DeLancey 2014, Jacques 2016b, Gong 2017), in particular because affixes that are non-productive and in some cases only accessible through reconstruction (such as the sigmatic causative) in Tibetan and Chinese are still productive in Rgyalrong languages.

The present paper deals with another case comparable of recessive morphology in the literary languages, the sigmatic and velar nominalization prefixes. These prefixes, which are completely productive in Rgyalrong languages such as Japhug, are only attested in a handful of words in Tibetan and Old Chinese. Using evidence from Japhug to ascertain the precise meaning of these prefixes, this study proposes new etymologies and evaluates older proposals.

2 Participles in Rgyalrongic

Rgyalrongic languages have a set of prefixes deriving non-finite verb forms, including participles, converbs and infinitives (Jacques 2014a, Sun 2014a,

*I would like to thank José Andrés Alonso de la Fuente, Nathan W. Hill and Laurent Sagart for useful comments. The glosses follow the Leipzig Glossing Rules. Other abbreviations used here are: AUTO autobenefactive / spontaneous, DEM demonstrative, EMPH emphatic, INV inverse, LNK linker, PFV perfective, POSS possessor, FACT factual, SENS sensory. The Japhug examples are taken from a corpus that is progressively being made available on the Pangloss archive (Michailovsky et al. 2014, http://lacito.vjf.cnrs.fr/pangloss/corpus/list_rsc.php?lg=Japhug). Middle Chinese is presented in an IPAnized version of Baxter's (1992) transcription.

Jacques 2016c). In the present paper, two sets of participles, the velar (core argument) and sigmatic (oblique) participles are discussed.

2.1 Velar participles

All Rgyalrong languages (Japhug, Tshobdun, Zbu and Situ) all have a set participle prefixes in **kV-** used in particular to build participial relative clauses with subject or object relativization. There are slight difference between the languages (Sun 2006, Sun & Lin 2007, Jacques 2016c, Zhang 2016); this paper only includes data from Japhug, which are sufficient to illustrate the constructions shared by all Rgyalrong languages.[1]

The core argument participle prefixes in Japhug are **kɯ-** for subject (S/A) participle and **kɤ-** for object participle, and can be illustrated by examples (1) (intransitive subject, in a non-restrictive head-internal relative) (2) (transitive subject) and (3) (object and intransitive subject).

(1) [**nɯ ɯ-ŋgɯ ʁgoɕna kɯ-rɤʑi**] **nɯ kɯ**
DEM 3SG.POSS-inside spider NMLZ:S/A-remain DEM ERG
pjɯ-mtsʰɤm tɕe,
IPFV-hear LNK
'The spider, which stays inside, feels it.' (26-mYaRmtsaR, 64)

(2) [**tɯ-xtsa ɯ-kɯ-tʂɯβ**] **nɯ ɯ-pʰe**
INDEF.POSS-shoe 3SG.POSS-NMLZ:S/A-sew DEM 3SG.POSS-DAT
'(He told) the shoe sewer.' (2003tWxtsa, 12)

(3) [**ta-ʁi pɯ-kɤ-βde**] **nɯnɯ,**
INDEF.POSS-younger.sibling PFV-NMLZ:P-throw DEM
[**pɯ-kɯ-si**] **nɯnɯ pɣʏtɕɯ ci to-sci,**
PFV-NMLZ:S/A-die DEM bird INDEF IFR-be.born
'The younger sister, who had been throw away, who had died, was reborn as a bird.' (qaCpa2002, 152)

Adjectival stative verbs need to take the participle **kɯ-** prefix to be used as attributes. The noun they modify is the head of the participial relative, which is generally head-internal as **wuma ʑo kʰa kɯ-ʑru** 'very splendid house' ('house that is very splendid/luxurious') in (4), as shown by the place of the intensifier **wuma ʑo**.

(4) [**wuma ʑo kʰa kɯ-ʑru**] **ɯ-ŋgɯ nɯtɕu**
really EMPH house NMLZ:S/A-be.strong 3SG.POSS-inside DEM:LOC
tó-wɣ-tsɯm tɕe
IFR:UP-INV-take.way LNK

[1] The participle prefixes are historically related to generic person and infinitive prefixes (Sun 2012, Sun 2014b, Jacques 2016a, Jacques 2018), but these are not discussed in this paper.

'The bird took her away to a splendid house (in heaven).' (2003zrAntCW tWrme, 74)

In addition, there is handful of lexicalized participles, where the vowel in the prefix has been lost and which appear as fricativized preinitials **x-** or **ɣ-** in Japhug (see Table 1 from Jacques 2014b: 5). Among these, **–ɣɲɟɯ** 'opening, orifice' has cognates in Stau and Khroskyabs (Jacques et al. 2017: 609).

Table 1: Irregular nominalizations in **ɣ**– and **x**–

noun	meaning	base verb	meaning
ɣndʑʏβ	'disastrous fire'	**ndʑʏβ**	'burn'
–ɣɲaʁ	'disaster'	**ɲaʁ**	'be black'
–ɣɲɟɯ	'orifice'	**ɲɟɯ**	'open (vi)'
–xso	'empty thing'	**so**	'be empty'

The velar participle prefixes found in Rgyalrong languages have cognate prefixes in many Trans-Himalayan languages, including Bodo-Garo, Jinghpo, Kuki-Chin, Karbi and Kiranti (Konnerth 2016, DeLancey 2015). In some languages, such as Limbu, the velar nominalization prefixes co-occur with a nominalization suffix. The active participle **kɛ-...-pa** serves as active participle (van Driem 1987: 199-202), as in (5), is an example of this type of construction.

(5) **kɛ-de:ŋ-ba** **te:ʔl-in** **thund-u**
NMLZ-tear-NMLZ clothes-ABS mend-3P
'He mends torn clothes.' (van Driem 1987: 201)

2.2 Sigmatic participles

In addition to the velar prefixes, we also find in Rgyalrong languages oblique participle prefixes (in Japhug **sʏ-**, **sʏz-** or **z-**) and related converbial forms (Yanmuchu 2005, Sun 2014a, Jacques 2016c).

The oblique participles are fully productive, and can be applied to any verb, even stative verbs (6). They can be converted into nouns (in particular for instruments, such as **sʏcɯ** 'key' from the verb **cɯ** 'open') even placenames (there is for instance in Kamnyu village a place called **znʏrɣʏma**, a lexicalized locative participle from the verb **nʏrɣʏma** 'to call the rain'), but are most commonly used to build participial relatives, relativizing oblique arguments and adjuncts.

(6) **stu ɯ-sɤ-dɤn nɯ stɤmku nɯra**
most 3SG.POSS-NMLZ:OBLIQUE-be.many DEM grassland DEM:PL
ŋu-nɯ
be:FACT-PL
'The (places) where they are the most numerous are the grasslands.' (19-qachGa mWntoR, 24)

Among the syntactic roles that can be relativized with the oblique participle are instrumental adjuncts (7), dative arguments (8), comitative arguments (9), time adjuncts (10) and locative adjuncts / goals (6, 11). Japhug text examples from each category are presented here to facilitate comparison with Tibetan and Chinese examples in the following sections.

(7) [**qandʑi cʰɯ-sɤ-ɣnda**] **nɯ tʰoŋtʰɤr ɲɯ-rmi**
bullet IPF-NMLZ:OBLIQUE-ram DEM ramrod TESTIM-call
'What is used to ram a bullet (into the muzzle of the gun) is called a ramrod.' (28-CAmWGdW, 55)

(8) [**ɯ-sɤ-fɕɤt**] **pjɤ-me qʰe tɕe**
3SG-NMLZ:OBLIQUE-tell IPFV.IFR-not.exist LNK LNK
tɤ-pɤtso ɯ-ɕki nɯ tɕu nɯra tɕʰi
INDEF.POSS-child 3SG-DAT DEM LOC DEM:PL what
pɯ-kɯ-fse nɯra pjɤ-fɕɤt.
PST-NMLZ:S-be.like DEM:PL IFR-tell
'She had no one (else) to tell it to, so she told the boy everything that had happened.' (140515 congming de wusui xiaohai, 77)

(9) **tɕe** [**ɯʑo ɯ-sɤ-ɤmɯmi**] **nɯ**
LNK it 3SG-NMLZ:OBLIQUE-be.in.good.terms DEM
dɤn ma ca kɯ-fse qaʑo
be.many:FACT because musk.deer NMLZ:S-be.like sheep
kɯ-fse, tsʰɤt kɯ-fse, ɯʑo cʰo kɯ-naχtɕɯɣ
NMLZ:S-be.like goat NMLZ:S-be.like it with NMLZ:S-be.identical
sɯjno, xɕaj ma mɤ-kɯ-ndza nɯ ra cʰo nɯ
herbs grass apart.from NEG-NMLZ:A-eat DEM PL with DEM
amɯmi-nɯ tɕe,
be.in.good.term:FACT-PL LNK
'The (animals) that are in good terms with the rabbit are many, it is in good terms with those that only eat grass, like musk deer, sheep or goats.' (04 qala1, 33-4)

(10) **tɕe nɯnɯ ʑaka** [**ɯ-sɤ-ji**] **ɲɯ-ŋu tɕe**
LNK DEM each 3SG-NMLZ:OBLIQUE-plant SENS-be LNK
'These are the (periods) when people plant each of these (crops).' (15 tChWma, 19)

(11) **kɯki tɯ-ci ki ɯ-tɯ-rnaʁ**
this INDEF.POSS-water this 3SG-NMLZ:DEGREE-deep
mɯ́j-rtaʁ tɕe, aʑo [**a-sɤ-ɣi**]
NEG:SENS-deep LNK I 1SG-NMLZ:OBLIQUE-come
mɯ́j-kʰɯ
NEG:SENS-be.able
'The water is not deep enough, there is not (enough) place for me to come.' (2010-03, 4)

Lexicalized instrumental or locational nouns derived from a transitive verb are often built from the sigmatic participle of the antipassive (with the prefix **rɤ-**, whose origin is explained in Jacques 2014b), as in **z-rɤ-xsɯr** 'wok' (from the verb **xsɯr** 'parch, fry') or **z-rɤ-rɤt** 'writing implement (paper or pen)' (from the verb **rɤt** 'write')

There are several clues indicating that the oblique participle prefixes in Rgyalrong languages are not recently innovated. First, outside of core Rgyalrong, there are fossilized traces of sigmatic nominalization prefixes with instrumental or locative value in Khroskyabs (Lai 2017: 511) and Tangut (Jacques 2014c: 256-257). Second, within Rgyalrong, these prefixes have many allophones and there are several lexicalized nouns derived from oblique participles, even as first element of compounds, like **sɤqrɤcʰa** 'alcohol to treat the guests' from **cʰa** 'alcohol' and **sɤqrɤ-**, the status constructus of the oblique participle **sɤ-qru** of the verb **qru** 'meet, greet (迎接)'. Third, there is no plausible source for this prefix, as if it were from a relator noun meaning 'place' for instance, it should have been grammaticalized as a suffix.

2.3 Sigmatic converbs

Forms related to the sigmatic participles include purposive converbs (12) and gerunds (13 and 14), but there are recently derived from the participles (Jacques 2014a: 272-273).

(12) [**kɯ-lɤɣ acɤβ nɯ kɯ ɯ-mɤ-sɤ-jmɯ~jmɯt**,]
NMLZ:S/A-herd Askyabs DEM ERG 3SG-NEG-PURP:CONV-forget
ɯ-pʰɯŋgɯ nɯ tɕu rdɤstaʁ-pɯpɯ tɕʰɯrdu ci
3SG.POSS-inside.clothes DEM LOC stone-little pebble INDEF
ɲɤ-rku,
IFR-put.in
'The shepherd Askyabs put a little pebble inside his clothes so that he would not forget it.' (qaCpa, 166)

The gerund generally means simultaneous action, without any obligatory argument coreference between the gerund clause and the main clause, as

shown by (13), where the verb in the gerund clause is intransitive, and its subject **ɯ-qom** 'her tears' is not even an argument of the main clause (however, the transitive subject of the main clause is coreferent with the third person possessor of **ɯ-qom**).

(13) **ɯ-qom sɤ-ɬɯ~ɬoʁ kɯ ɲɤ-mɟa tɕe**
3SG.POSS-tear GERUND-come.out ERG IFR-take LNK
'She took it (from hear mother's hand) while her tears flowed.' (140428 mu e guniang, 31)

Most commonly however, the subject of the greund clause is coreferent with that of the finite verb in the main clause, as in (14). Note the absence of 1SG person indexation on the gerund, as opposed to the finite verb **ku-rɤʐit-a**.

(14) **kutɕu sɤ-mtsɯ~mtsɯr ku-rɤʐit-a tɕe, jisŋi ndɤ**
here GERUND-be.hungry IPFV-remain-1SG LNK today however
tɯmɯkɯmpɕi kɯ pú-wɣ-nɯ-mbi-a
heavens ERG PFV:DOWN-INV-AUTO-give-1SG
ɕti
be.AFFIRM:FACT
'While I am staying here in hunger, today heavens have sent it (down) for me (to eat).' (Norbzang 2005, 253)

The gerund is also used to describe a background situation, as in (15).

(15) **nɯ sɤ-rkɯ~rkɯn ʐo tɤ-pɤtso cʰú-wɣ-tɕɤt**
DEM GERUND-be.few EMPH INDEF.POSS-child IPFV-INV-take.out
pjɤ-ra tɕe,
IFR.IPFV-have.to LNK
'One had to raise children with little (while food and clothes were few).' (140426 tApAtso kAnWBdaR, 5)

The gerund also occurs in lexicalized expression with a specific meaning, for instance the gerund **sɤ-xtɕɯ-xtɕi** from **xtɕi** 'be small' can mean 'when X was young, since childhood'.

3 Tibetan

Tibetan,[2] like Khroskyabs, is a language where the prefixes corresponding to syllabic prefixes in core Rgyalrong languages have become simple conso-

[2]This section presupposes accepted knowledge concerning Tibetan historical phonology and morphology (Li 1933, Coblin 1976, Hill 2011, 2014b), and obvious alternations (such as aspiration) are not commented on. The transcription of Tibetan adopted follows Jacques (2012a).

nants, without phonemic vowel. As a result of the dramatic syllabic contraction that occurred in proto-Tibetan, much of the archaic morphology has become obscured.

3.1 Velar nominalization

The complementary distribution of velar **g-** and dental **d-** preradicals in Tibetan, an observation which Hill (2011) ascribes to Saskya Paṇḍita but which was first pointed out in modern scholarship by Li (1933), suggests that velar presyllables have been dissimilated to dentals (***kə-** → **d-**) before velars and labials, and that dental presyllables have been dissimilated to velars (***tə-** → **g-**) before dentals. There is no way to distinguish between ***kə-** and ***tə-** presyllables from Tibetan alone, except before the initial **r-** (and perhaps **l-**), where no dissimilation took place.[3]

A certain number of examples of **g-** or **d-** preinitials, often together with a **-n**, **-d** or **-s** suffix (forming a circumfix like the active participle in Limbu in §2.1) derive nouns from verbs or adjectives, with either action nominal or subject nominal meaning (Jacques 2014d).

Examples with the **g-** allomorph include the following:[4]

- ནག་པོ་ *nag.po* 'black' (root |**nag**|) → གནག་ *gnag.pa* 'black ox'
- གླུ་ *blu, blus* 'buy off, ransom' (root |**lu**|) → གླུད་ *glud* 'ransom ritual'[5]
- ཡོ་ *jo* 'crooked' (root |**jo**|) → གཡོ་ *gjo* 'deceit'
- ཉེ་ *ɲe* 'near' (root |**n(j)e**|) → གཉེན་ *gɲen* 'relative; friend'
- ཉོ་ *ɲo* 'buy' (root |**ɲo**|) → གཉོད་ *gɲod* 'price (of a bride)'
- ཟ་ *za* 'eat' (root |**za**|) → གཟན་ *gzan* 'food (for animals)'
- འཛིན་ *ⁿdzin, bzuŋ* 'seize, hold'(root |**zuŋ**|) → གཟུངས་ *gzuŋs* 'dhāraṇī'
- ཞིབ *ʑib* 'fine, subtle' (root |**ʑib**|) → གཞིབ་ *gʑib* '(finely ground) flour'[6]

[3] As a consequence, it is possible that the prefix **d-/g-** in some of the examples below alternatively reflects the cognate of the action nominalization / degree nominalization **tɯ-** prefix in Japhug, on which see Jacques (2014b) and Jacques (2016a: 233-236), found in the form **ɯ-tɯ-rnaʁ** 'its depth' in example (11).

[4] Of these examples, since Japhug cognates of Tibetan ནག་པོ་ *nag.po* 'black' and ཟ་ *za* 'eat' exist (**ɲaʁ** 'be black' and **ndza** 'eat' respectively), the velar nominalized forms གནག་ *gnag.pa* 'black ox' and གཟན་ *gzan* 'food (for animals)' have Japhug counterparts (**kɯ-ɲaʁ** 'black one, the one which is black' / **-ɣɲaʁ** 'disaster' and **kɤ-ndza** 'eating; food'). These are however parallel formations, and do not reflect common inheritance.

[5] Concerning this ritual, see Karmay (1991).

[6] Attested in PT 977, གཞིབ་ཟེ་གང་ཡིས་རྒྱ་ཟེ་གང་མཛལ་པ་དང་ *gʑib bre gaŋ gʲis mu tig bre gaŋ mdʑal pa daŋ* 'A *bre* of flour was traded for a *bre* of pearls' (Silk 2018: 430).

The example གཟུངས་ *gzuŋs* ‘dhāraṇī’ is evidence that the **d/g-…-s** circumfix was still marginally productive in the imperial period, as it is calque from the Sanskrit **dhṛ** ‘hold’ (the root from which **dhāraṇī** derives), and must postdate the introduction of Buddhism.

In addition, Tibetan གཞོབ་ **gʑob**, translated in Zhang (1993) as 烧焦；火烧的恶臭 ‘burn; smell of singeing’, could be cognate with the Japhug irregular velar nominalization **ɣndʑɤβ** ‘disastrous fire’ (Table 1). Note however the attestation of གཞོབ་ **gʑob** in the glossary studied by Li (1962) in (16) corresponding to Chinese 皆被焚燒火災滅後灰燼不現及至餘影亦不可得.

(16) བསྲེགས་ཞིན་གཞོབ་ཏུ་རླགས་ནས་དུ་བ་ཡང་མྱེད་ཐལ་བའི་ལྷག་མ་མྱེད་པ་
bsregs.ɕiŋ gʑob.tu rlags.nas du.ba jaŋ mʲed tʰal.baɦi lhag.ma mʲed.pʰa
‘(completely) burnt and destroyed in a fire, not even leaving smoke or ashes’

In this passage, གཞོབ་ **gʑob** corresponds to 火災, with exactly the same meaning as the Japhug noun. The meaning ‘burning smell’ might be due to an abbreviation of the compound གཞོབ་དྲི་ *gʑob.dri* ‘burning smell’ in compounds. If this etymology is correct, the use of གཞོབ་ **gʑob** as a verb is due to zero conversion.

Examples of the **d-** allomorph (with verb roots in velar and labial initials) include the following:

- ངུ་ *ŋu, ŋus* ‘cry’ (root |**ŋu**|) → དངུད་མོ་ *dŋud.mo* ‘sob, wail (n)’
- ངན་ *ŋan* ‘evil’ (root |**ŋan**|) → དངན་པ་ *dŋan.pa* ‘sorcery, evil’
- འཁྱིལ་ *ᵑkʰʲil* ‘gather (of water), whirl, twist round’ (root |**ŋan**|) → དཀྱིལ་ *dkʲil* ‘center’[7]
- མང་ *maŋ* ‘many’ (root |**maŋ**|) → དམངས་ *dmaŋs* ‘people’
- འཁུ་ *ᵑkʰu* ‘offend, contend with, turn against’ (root |**kʰu**|) → དཀུ་ *dku* ‘trickery, deceit’[8]

It is conceivable that some of the **g-/d-** prefixes found in the Tibetan verbal system, in particular in the future tense, may be participial form that entered the finite system. This question goes however beyond the scope of this paper.

[7] The meaning ‘center’ would be derived from a older meaning ‘confluence’. The verb འཁྱིལ་ *ᵑkʰʲil* ‘gather, whirl’ is used for instance to refer to water gathering into a pond.

[8] See Bialek (2016: 150-1) for the philological study of this noun in Old Tibetan texts and the proposal of a derivation from the verb འཁུ་ *ᵑkʰu* ‘offend, contend with, turn against’, though she analyzes the **d-** prefix as a transitivizer, and postulates that the noun derives from an unattested transitive verb ***dku** ‘bend, make crooked’.

3.2 Sigmatic nominalization

Examples of oblique nominalization by sigmatic prefix in Tibetan are not many. The clearest ones, unsurprisingly, involve the instrumental nouns (the function illustrated by 7 in Japhug). As in the case of the velar nominalization prefix, as noted above, the sigmatic nominalization prefix generally occurs together with a suffix **-d** or **-s**, as in སྣོད་ *s-no-d* 'vessel'.[9]

- སྣོད་ ***nod, mnos*** 'receive' (root |**no**|) → སྣོད་ ***snod*** 'vessel'
- འབུད་ ***ⁿbud, bus*** 'blow' (root |**bu**|) → སྦུད་པ་ ***sbud.pa*** 'bellows'
- འགེལ་ ***ⁿgel, bkal*** 'load on' (root |**gal/kal**|) → སྒལ་ ***sgal*** 'load, back'
- ཉན་ ***ɲan*** 'hear' → (root |**ɲan**|) སྙན་ ***sɲan*** 'ear (honorific)'

The examples above are not problematic; note that in the case of honorific སྙན་ ***sɲan*** 'ear', we possibly have a calque from Sanskrit **śrava-**, which is attested in the sense of 'ear' in Classical Sanskrit. The adjective སྙན་ ***sɲan*** 'euphonious' is also derived from ཉན་ ***ɲan*** 'hear', but through another **s-** prefix, the cognate of the deexperiencer prefix **sɤ-** in Japhug, which is found in examples such as **mtsʰɤm** 'hear' → **sɤ-mtsʰɤm** 'audible' (Jacques 2012d).

Nouns of location derived by the prefix **s-** (corresponding to Japhug examples such as 6 and 11) include the following:

- འདིང་ ***ⁿdiŋ, btiŋ*** 'lay out, spread out' (root |**diŋ/tiŋ**|) → སྡིངས་ ***sdiŋs*** 'flat surface'
- འགར་ ***dgar, bkar*** 'pitch (tent)' (as in **gur bkar** 'pitch a tent', root |**gar/kar**|) → སྒར་ ***sgar*** 'encampment'
- འཆད་ ***ⁿtɕʰad, tɕʰad*** 'be cut, be broken off' (root |**tɕʰad**|) → ཅད་ ***ɕad*** 'division stroke'
- འཁོར་ ***ⁿkʰor*** 'turn, circumambulate' → སྐོར་ ***skor*** 'circle'
- དམའ་ ***dma*** 'low' → སྨད་ ***smad*** 'lower part'[10]
- མཐོ་ ***mtʰo*** 'high' → སྟོད་ ***stod*** 'upper part'[11]

[9] Another derivation involving **s-...-d** circumfixes are found in Tibetan: the collective noun derivation found with kinship terms such as སྐུད་ ***skud*** 'husband's male relatives' from ཁུ་ ***kʰu*** 'father's brother', སྤུན་ ***spun*** 'brothers' from ཕ་ཏུ་ ***pʰu.nu*** 'elder and younger brothers' (Nagano 1994). This formation is unrelated to the sigmatic nominalization described in this section.

[10] In this example, the base adjective དམའ་ ***dma*** 'low' contains a **d-** from a velar presyllable ***kə-** which underwent dissimilation. Note also the adverb མར་ ***mar*** 'down' from the same root, with a terminative **-r** suffix.

[11] This example suggests that the pre-Tibetan cluster ***smt-** was simplified as **st-**.

- འདྲུད་ *ⁿdrub, ⁿdrubs* ‘sew’ → སྒྲབས་ *srubs* ‘gap, fissure’

In this list, note that the noun སྐོར་ ***skor*** ‘circle’ may be derived from the causative སྐོར་ ***skor*** ‘cause to turn, surround, circumambulate’ and therefore not be an example of sigmatic nominalization prefix. The same explanation is not possible for the other examples, however.

The derivation of ཤད་ ***ɕad*** ‘division stroke’ from འཆད་ ***ⁿtɕʰad, tɕʰad*** ‘be cut, be broken off’ as proposed by Li (1933: 141)[12] with a proto-form ***s-tɕad** → **ɕad** is a non-trivial example of sigmatic nominalization; this word would mean literally ‘breaking place (when reading)’.

In addition to these two main categories, there are two potential isolated examples of sigmatic nominalization. First, the noun སྐྱོན་ ***skʲon*** ‘fault’ is clearly derived from the verb བཀྱོན་ ***bkʲon*** ‘scold, reprimand’ (whose **b-** may be a frozen past tense prefix); the semantic relation between the verb and the noun may be that of cause, a type not attested in Japhug.

Another example is སྐག་ ***skag*** ‘(astrological) hindrance, obstacle’, which could derive from the verb འགོག་ ***ⁿgog, bkag*** ‘hinder’,[13] a temporal nominalization, like the Japhug example (10). This is the only example from verbs with voicing alternation (on which see Jacques 2012c and Hill 2014a) where the oblique nominalization is based on the voiced alternant.

4 Old Chinese

Reconstruction of morphology in Old Chinese is a much more delicate enterprise that in Tibetan, since even the mere existence of clusters has to be reconstructed (Gong & Lai 2017). Nevertheless, there are potential cases of nominalization prefixes in Old Chinese, whose interpretation depends on the reconstruction system followed.

[12] Note that while Li Fang-kuei’s sound law ***s-tɕ-** → **ɕ-** is certainly correct (as pointed out by Abel Zadoks in an unpublished manuscript for instance, the numeral **ɲi.ɕu** ‘twenty’ can be explained as an instance of this sound change, the proto-form being ***ɲis-tɕu**, perfectly parallel to **sum.tɕu** ‘thirty’), some of his examples have to be abandoned. For instance, he argues that གྱམ་ ***gɕam*** ‘lower part, under’ derives from **tɕʰam** in the expression ཆམ་ལ་འབེབས་ ***tɕʰam-la ⁿbebs*** ‘defeat completely’, a collocation containing the verb འབེབས་ ***ⁿbebs, pʰab*** ‘cast down’). However, the syllable **tɕʰam** here is more plausibly related to the verb འཇོམས་ ***ⁿndʑoms, btɕoms*** ‘subdue, destroy’. The noun གྱམ་ ***gɕam*** ‘lower part, under’ is more likely to be the exact cognate of Japhug **tɤ-zrɤm** ‘root’ and Chinese 參 **ʂim** ← ***srəm** ‘plant root’ (see Jacques 2015), with the sound laws ***sr-** → **ɕ-** and ***tə-** → **g-** before coronal consonants (on the latter, see the discussion in § 3.1); the **g-** would reflect the indefinite possessor prefix (the noun ‘root’ being an inalienably possessed noun).

[13] Another possibility would be the adjective ཁག་པོ་ ***kʰag.po*** ‘difficult, hard’, if ancient attestations can be brought to light. Uebach (2006: 109) provides numerous attestations of གེག་ **keg**, གག་ **kag**, སྐེག་ **skeg**, སྐག་ **skag**, སྐྱེག་ **skʲeg** ‘kalendarisch ungünstige, gefährliche Zeit, Hindernis, drohendes Unglück’. The s-less forms are found as second members of compounds, as in དགུང་གེག་ ***dguŋ.keg*** ‘(astrological) hindrance (honorific)’. Uebach cites 忌 **giH** ‘taboo, abstain from’ apparently suggesting that the Tibetan word could be related; this is impossible for phonological reasons (voiced initial and absence of coda).

4.1 Velar nominalization

Evidence for velar nominalization in Old Chinese is slim, but not non-existent. Baxter & Sagart (2014: 57) suggest the following possibilities:

1. 方 **pjaŋ** 'square' (***C-paŋ**) → 匡 **kʰjwaŋ** 'square basket' (***k-pʰaŋ**)
2. 明 **mjæŋ** 'bright' (***mraŋ**) → 囧 **kjwæŋX** 'bright window' (***k-mraŋʔ**)
3. 威 **ʔjwɨj** 'awe-inspiring' (***ʔuj**) → 鬼 **kjwɨjX** 'ghost' (***k-ʔujʔ**)

It is however likely that some Old Chinese ***kə-** presyllables disappeared without observable traces in Middle Chinese, as shown by the data in Table 4.47 in Baxter & Sagart (2014: 153), where data from ancient loanwords into Vietic and Lakkia demonstrate the presence of a velar preinitial element in words such has 賊 **dzok** 'bandit' (Ruc **kəcʌk**). By consequence, most of potential traces of velar nominalization prefixes may have been lost by the effects of sound change, though the study of OC loanwords in Kra-Dai, Vietic and Hmong-Mien may provide us examples.

4.2 Sigmatic nominalization

Sagart (1999: 73) proposed the following examples of ***s-** nominalization prefix (I keep here the original reconstruction, without conversion to the system of Baxter & Sagart 2014, as none of these examples has become invalid in the new reconstruction).

1. 蒸 **tɕiŋ** 'to steam' (^{b}***tɨŋ**) → 甑 **tsiŋH** 'earthenware pot for steaming rice' (^{b}***s-tɨŋ-s**)
2. 拙 **jet, jejH** 'to pull' (^{b}***lat(-s)**) → 鞮 **sjet** 'leading string' (^{b}***s-lat**)
3. 噬 **ŋet** 'to bite, gnaw' (^{a}***ŋet**) → 楔 **set** 'wedge, piece of wood between the teeth of a corpse' (^{a}***s-ŋet**)
4. 射 **ʑek, ʑæH** 'to shoot' (^{b}***m-lak(-s)**; the ***-s** suffix here has an antipassivizing function, see Jacques to appear) → 榭 **zjæH** 'open hall for archery exercises' (^{b}***s-lak-s**)[14]
5. 侍 **dʑiH** 'to accompany, wait upon' (^{b}***dɨ(ʔ)-s**) → 寺 **ziH** 'servant, eunuch' (^{b}***s-dɨ(ʔ)-s**)
6. 食 **ʑik** 'to eat' (^{b}***m-lɨk**) → 食 **ziH** 'food' (^{b}***s-lɨk-s**)

[14] Note that the locative noun 榭 **zjæH** is based on the antipassive form of the verb, as we find in Japhug (§ 2.2).

Additional examples are presented in Baxter & Sagart (2014: 56) and Sagart & Baxter 2012. Some of these nouns, for instance 星 **seŋ** 'star' and 席 **zjek** 'mat', are derived from a root that is only attested in derived verbal forms.

1. 羍 **ŋjæk** 'go against, reverse' (***ŋrak**) → 朔 **ʂæwk** 'first day of month' (***s-ŋrak**)
2. 通 **tʰuŋ** 'penetrate' (***l̥ˤoŋ**) → 窗 **tʂʰæwŋ** 'window' (***s-l̥ˤ<r>oŋ**)
3. 亡 **mjaŋ** 'flee; disappear; die' (***maŋ**) → 喪 **saŋ** 'mourning, burial' (***s-mˤaŋ**)
4. 以 **jiX** 'take, use' (***ləʔ**) → 鉏 **ziX** 'handle of plow or sickle' (***sə.ləʔ**)
5. 晴 **dzjeŋ** 'clear (weather)' (***N-tsʰeŋ**), 清 **tsʰjeŋ** 'clear' → 星 **seŋ** 'star' (***s-tsʰˤeŋ**, Baxter & Sagart 2014: 139)[15]
6. 署 **dʑoH** 'to place; position' (***m-taʔ-s**), 緒 **zjoX** 'arrange in order' (***s-m-taʔ**), 著 **ʈjak** 'to place' (****t<r>ak**) → 席 **zjek** 'mat' (***s-m-tAk**, Baxter & Sagart 2014: 61)
7. 除 **djo** 'remove' (***[l]<r>a**) → 鋤 **dzjo** 'hoe' (***s-[l]<r>a**, Baxter & Sagart 2014: 81)
8. 匀 **jwin** 'even, uniform' (***[N-q]ʷi[n]**) → 旬 **zwin** 'ten-day cycle' (***s-N-qʷi[n]** , Baxter & Sagart 2014: 127)
9. 處 **tɕʰoX** 'be at' (***t.qʰaʔ**) → 所 **ʂjoX** 'place, nominalizer' (***s-qʰ<r>aʔ**, Baxter & Sagart 2014: 130)

[15] Even if one accepts the sound change ***s-tsʰ-** → **s-**, analyzing 星 **seŋ** 'star' as a locative nominalization ***s-tsʰˤeŋ** from a root ***tsʰeŋ** attested by 晴 **dzjeŋ** 'clear (weather)' and 清 **tsʰjeŋ** 'clear' is problematic. Although the graphs belong to the same phonetic series and the affricate onset is supported by Min data, the semantic difference is considerable, since these adjectives never mean 'bright' and are not associated to stars. The only way to salvage the hypothesis would be to suppose a locational/temporal noun 'clearing (in the night sky)' ⇒ 'starry sky' (night sky without any cloud), from which 'star' would be a singulative. The meaning 'starry sky' for 星 **seŋ** may be attested, as in the following passage from the poem 定之方中 Ding Zhi Fang Zhong (50) in the Shijing: 靈雨既零、命彼倌人。星言夙駕、說于桑田。 'When the good rains had fallen, He would order his groom, **By starlight**, in the morning, to yoke his carriage, And would then stop among the mulberry trees and fields.' (translation by Legge). Karlgren (1974: 33) translates it as 'when it cleared during the night, early he yoked his carriage'.

From a phonological point of view, reconstructing ***s-tsʰ-** is not the only logical possibility to account for the **s-** to ***tšʰ-** correspondence between MC and proto-Min, and the xiesheng contacts with words in affricates. For instance, a reconstruction ***tə-sˤeŋ** with a dental presyllable, fusing with the main syllable in the ancestor of Min, could also be considered. In this hypothesis, an etymological relationship with the words meaning 'clear' would have to be abandoned.

10. 圓 **hjwen** ‘round’ (***ɢʷ<r>en**) → 旋 **zjwenH** ‘whorl of hair on the head’ (***s-ɢʷen-s**, Baxter & Sagart 2014: 141)[16]

11. 尼 **nejX** ‘to stop’ (***nˤərʔ**) → 西 **sej** ‘west’, 棲 **sej** ‘bird’s nest’ (***s-nˤər**, Baxter & Sagart 2014: 147)[17]

While some of sound changes involved are not universally accepted, in particular ***s-tsʰ-** → **s-** and Li Fang-kuei’s (Li 1971) idea of ***sN-** → ***s-** (see the debate between Mei 2012 and Sagart & Baxter 2012), the change ***sl-** → **z-** in B type syllables is least controversial.[18] Even if we exclude all examples with controversial onsets for the sake of argument, we still have good examples of locative (榭 **zjæH**), comitative (寺 **ziH**) and instrumental (鉏 **ziX**) nominalizations, comparable to Japhug examples (6, 11), (9) and (7) respectively. The case of 食 **ziH** ‘food’ is more doubtful because there is a causative 食 **ziH** ‘feed’ from which it could derive by zero derivation, and also because an oblique nominalization of ‘eat’ should rather mean ‘eating place’ or ‘instrument used for eating’, not ‘food’.

These three examples of sigmatic nominalization (榭 **zjæH**, 寺 **ziH**, 鉏 **ziX**) are not the only ones that seem relatively straightforward. Without committing to a particular reconstruction system, if we accept Li Fang-kuei’s (Li 1971) reconstruction of s + nasal onsets, and Bodman’s (1969) hypothesis of OC dental affricates originating from clusters in ***s-** (***s-T-** → ***TS-**), three examples of instrumental nominalization (楔 **set**, 甑 **tsiŋH** and 鋤 **dzjo** ‘hoe’) and three examples of temporal/locative nominalization (朔 **ʂæwk**, 喪 **saŋ**, 棲 **sej**) are fairly convincing.

A possible example of sigmatic converb (parallel to the gerund in Japhug, § 2.3 in examples such as 13 to 15) in Old Chinese is the conjunction 雖 **swij** ‘although’. This conjunction is already attested in the Shijing as in (17), where it occurs in opposition to the copula 維 **jwij** in the main clause.

(17) 周雖舊邦，其命維新

‘Though Chow is an old state, its (heavenly) appointment is new.’ (235; Daya, Wenwang, Karlgren 1974: 185)

An etymological relationship between 雖 **swij** ‘although’ and 維 **jwij** ‘be’ is likely given their occurrence in the same phonetic series.[19] A copula with

[16] The word 旋 **zjwenH** is more likely to be a nominalization by *qùshēng* from the verb 旋 **zjwen** ‘revolve, turn’ (on which see Downer 1959, Jacques 2016b).

[17] This example, also discussed in Sagart (2004) and Nohara (2018), would have a direct Japhug equivalent **sɤz-nɯna** ‘resting place’. These are however not real cognate, since the Japhug word can be productively formed from the verb **nɯna** ‘to rest’.

[18] On the voicing of preinitial ***s-** in contact with a voiced lateral, see the typological discussion in Gong (2016), with evidence from Rgyalrongic and Tibetic languages.

[19] See also Behr (2006) for further philological evidence for an etymological relationship between 雖 **swij** and 維 **jwij**. Behr views the ***s-** prefix as a causative, an interpretation that is not impossible, but is more complex than that proposed here.

a converbial ***s-** prefix would mean 'while being XXX', a form that can have a concessive meaning in appropriate context (in the same way that English 'while', originally a temporal conjunction, has also become concessive) and could have become restricted in this usage.

Baxter and Sagart reconstruct 雖 **swij** as ***s-qʷij** and 維 **jwij** as ***ɢʷij**, and do not imply a morphological relationship between the two; in their system, the expected outcome of ***s-ɢʷij** would be †**zwij**. There are several ways around this problem; Jacques (2000) reconstructs 雖 **swij** as ***s-tə-wuj** and 維 **jwij** as ***tə-wuj**, using a system based on Sagart (1999); in this hypothesis, the presence of a ***tə-** preinitial, reconstructed here to account for the xiesheng relationship with 推 **tʰwoj** (from ***tʰʂʰuj**), accounts for the absence of voicing. If the reconstruction of a preinitial in this word is not accepted, it remains possible to suppose that, given the fact that this converbial prefix was probably not lexicalized at the same time as the other ***s-** prefixes, different sound laws apply.

Although the existence of sigmatic nominalization in Old Chinese is less immediately obvious than in Tibetan, the number of examples is of a comparable order.

5 Conclusion

The Tibetan and Chinese data presented in this paper support the idea that the sigmatic prefixes of Rgyalrong languages are not a Rgyalrongic innovation, but rather the preservation of prefixes that used to exist in the literary languages, but of which only fossil traces remain in the earliest attested stages of these languages. It is likely that traces of the same prefixes can be found elsewhere in the Trans-Himalayan family, though only few branches preserve unequivocal traces of the preinitials.[20]

It is hoped that the Japhug data provided in this paper will be useful to researchers of Old Chinese and Tibetan to look for additional examples of sigmatic oblique nominalization, and better evaluate the precise semantics of proposed etymologies: since the sigmatic participles are fully productive in Japhug, this language allows a finer-grained understanding of the use of this derivation than languages where only fossilized remnants can be identified.

The morphology-rich Rgyalrong languages have a role in the reconstruction of Trans-Himalayan morphology comparable to that of Sanskrit in Indo-European and Arabic in Semitic: their exuberant productivity offers an living model to build hypotheses on the traces of morphology in lesser-endowed languages.

[20] In particular, a possibly related nominalization prefix, which has the allomorphs **chya-**, **sha-** and **sa-**, is found in Jinghpo (Dai 1990: 3-4). However, it does not derive oblique nominals, and this comparison requires more investigations.

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