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# Phylogenies based on lexical innovations refute the Rung hypothesis

Guillaume Jacques and Thomas Pellard

CNRS-Inalco-EHESS, CRLAO

Sino-Tibetan (Trans-Himalayan) is one of the typologically most diverse language families in the world, one of the few comprising all gradients of morphological complexity, from isolating to polysynthetic. No consensus exists as yet on whether the rich morphology found in some languages, in particular person indexation, should be reconstructed in the common Sino-Tibetan ancestor or is a later innovation confined to and defining a particular “Rung” subgroup. In this article, we argue that this question is fundamentally a problem of phylogeny, and that the results of recent works on the phylogeny of Sino-Tibetan, supplemented by a more refined investigation of shared lexical innovations, provide support for the idea that person indexation morphology is not a recent innovation and that the languages lacking such a feature are thus innovative.

**Keywords:** Sino-Tibetan, Trans-Himalayan, phylogeny, Rung, Rgyalrongic, Kiranti, lexical innovations, person indexation

## 1. Introduction

One of the most vexing issues in [Sino-Tibetan \(ST\)](#) historical linguistics is the question of the reconstructibility of verbal morphology. [ST](#) languages present extreme typological diversity ([Arcodia & Basciano 2020](#)), and few, if any, typological features are common to the whole family. While many languages are almost prototypically isolating (e.g., Modern Chinese, Karen, Lolo-Burmese, Tujia, etc.), others have a rich polysynthetic structure (e.g., Rgyalrong and Kiranti; [Bickel et al. 2007](#); [Jacques 2013](#)). Determining how much morphology should be reconstructed for [proto-Sino-Tibetan \(pST\)](#) is thus a challenging question.

In particular, whether person indexation (i.e. “agreement”) should be recon-

structured for pST is still a highly debated issue. The **Polysynthetic Proto-Sino-Tibetan Hypothesis (PPSTH)** proposes that at least some of the person indexation systems found in various language groups are cognate and are inherited from pST, while the original system was lost in languages such as Chinese or Lolo-Burmese (Bauman 1975; van Driem 1993; DeLancey 2010b; Jacques 2012). On the other hand, the Rung hypothesis argues that part of those person indexation systems are not cognate but parallel innovations, and that if some are cognate, they are later innovations confined to a particular “Rung” subgroup of ST (LaPolla 1992; 2001; 2003; 2012; 2013). The debate about whether person indexation should be reconstructed in pST has reached an impasse: the PPSTH argues that cognate systems attested in many branches of the ST family, while the Rung hypothesis objects that languages with cognate indexation systems form a subgroup and appeals to the implausibility of such a system being repeatedly lost in many branches. The issue is thus intimately linked to the problem of the phylogeny of the ST family, but neither side is based on an independently motivated subgrouping hypothesis, to the risk of circularity. The controversy thus cannot be resolved on the sole basis of morphology but needs to look out for other kinds of evidence.

Reexamination of the issue of person indexation in ST is particularly timely since two recent independent studies of ST phylogeny using Bayesian methods on lexical data have recently been published (Zhang et al. 2019; Sagart et al. 2019). Their results are broadly similar, and neither supports the Rung hypothesis.<sup>1</sup> This article nevertheless proposes to examine the issue in more detail and with more data by empirically testing the prediction of the Rung hypothesis that shared lexical innovations should be found between the languages that share a person indexation system.

## 2. Sino-Tibetan verbal morphology and phylogeny

### 2.1. Rgyalrong and Kiranti person indexation

Person indexation systems are found in many ST languages, but opinions differ as to which are cognate (Bauman 1975; DeLancey 1989; 2010b; van Driem 1993) or the result of parallel developments (LaPolla 1992; 2001). The clearest case of cognate indexation morphology across branches of ST is that of Rgyalrong,

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1. LaPolla (2019), the main supporter of the Rung hypothesis, has expressed his endorsement of Zhang et al.’s (2019) results but has not discussed how these two incompatible hypotheses could be reconciled.

Nungish and Kiranti languages (Ebert 1990; Jacques 2012), which are generally considered to be historically related. The Rung hypothesis also considers them to be related, but views them as a later innovation restricted to the Rung subgroup (LaPolla 2003).

The relatedness of indexation systems across these branches is most obvious when one compares the transitive and intransitive singular paradigms of the Bantawa (Kiranti; Doornenbal 2009: 145) and Situ Rgyalrong (Lin 1993) languages (Table 1–2; shaded cells represent reflexive forms).<sup>2</sup> With the exception of the local configurations  $1 \rightarrow 2$  and  $2 \rightarrow 1$ , all affixes can be compared on a one-to-one basis (Table 3).

Table 1. Bantawa paradigm (singular forms)

	1O	2O	3O
1A		$\Sigma-na$	$\Sigma-u\eta$
2A	$ti-\Sigma-\eta a$		$ti-\Sigma-u$
3A	$i-\Sigma-\eta a$	$ti-\Sigma$	$\Sigma-u$ ( $i-\Sigma$ 3PL $\rightarrow$ 3SG)
INTR	$\Sigma-\eta$	$ti-\Sigma$	$\Sigma$

Table 2. Situ Rgyalrong paradigm (singular forms)

	1O	2O	3O
1A		$ta-\Sigma-n$	$\Sigma-\eta$
2A	$k\partial-w-\Sigma-\eta$		$t\partial-\Sigma-w$
3A	$w\partial-\Sigma-\eta$	$t\partial-w-\Sigma-n$	$\Sigma-w$ ( $w\partial-\Sigma$ 3' $\rightarrow$ 3)
INTR	$\Sigma-\eta$	$t\partial-\Sigma-n$	$\Sigma$

The 1SG suffixes ( $-\eta$  in Situ,  $-\eta/-\eta a$  in Bantawa) have exactly the same distribution in the two languages ( $1 \rightarrow 3$ ,  $3 \rightarrow 1$ , and  $2 \rightarrow 1$ , but not  $1 \rightarrow 2$ ), and the second person prefixes ( $t\partial-$  in Situ,  $ti-$  in Bantawa) only differ by the absence of  $t\partial-$  in the  $2 \rightarrow 1$  cell in Situ. However, this form is probably innovative in Rgyalrongic (Jacques 2018), and anyway some Rgyalrong languages such as Zbu do option-

2. A complete examination of the dual and plural forms of the intransitive and transitive paradigms lies beyond the scope of this paper, but additional cognate affixes can be identified (Jacques 2012).

**Table 3.** Morphological correspondences between Bantawa and Situ person affixes found in the singular paradigms

person	Bantawa	Situ
1SG	- <i>ŋ(a)</i>	- <i>ŋ</i>
2	<i>t</i> -	<i>tə</i> -
3O	- <i>u</i>	- <i>w</i>
inverse	<i>i</i> -	<i>wə</i> -

ally allow the second person *tə*- prefix instead of *kə*- in the 2→1 configuration too (X. Gong 2014). The third person direct (or object) (Situ -*w* and Bantawa -*u*) is present in 2→3 and 3→3 in both languages, but not in the 1SG→3 in Situ, though some irregular stem alternations in Zbu indicate that it was present in the 1SG→3 configuration in proto-Rgyalrong (X. Gong 2017).

The inverse prefix (Situ *wə*-, Bantawa *i*-) only appears in the 3→1SG and 3→3 cells in Bantawa, while it is found in 3→1SG, 3→2, 2→1, and also 3→3 cells in Situ. However, Bantawa has only one prefixal slot, and the absence of inverse in 3→2 and 2→1 can be analyzed as due to the fusion of the second person with the inverse \**ti-i* > *ti*-. In the 3→3 forms, the inverse prefix *i*- marks plural subject in Bantawa, in particular in the 3PL→3SG form *i*-Σ. Some innovative Situ dialects such as Sastod and Bragbar have lost the proximate vs. obviative opposition in 3→3 configurations<sup>3</sup> and reanalyzed the inverse as a plural subject marker (Sun 2015; Zhang 2019), resulting in a system very similar to that of Bantawa.<sup>4</sup>

The local forms 1→2 and 2→1 are less easily comparable between Situ and Bantawa, but there is clear evidence that the Rgyalrong forms are innovative: in particular, the 1→2 forms are probably ancient second person passive forms (Jacques 2018). However, local configurations are often renewed across languages with polypersonal indexation (Heath 1998; DeLancey 2018). The Bantawa 1→2 -*na* suffix, which has direct cognates in all Kiranti languages, may itself be related to the Situ second person singular -*n* suffix that appears in 1→2SG, 3→2SG and 2SG intransitive forms.

Some of the person indexation affixes in Table 3 indeed show similarities with pronouns and possessive prefixes. For instance, the 1SG -*ŋ* suffix is similar to the 1SG pronoun and to the 1SG possessive prefix of both Bantawa (resp. *iŋka*

3. It is well-attested in Tshobdun, Japhug and Zbu (Sun & Shidanluo 2002; Jacques 2010; X. Gong 2014).

4. In West Rgyalrongic, the inverse form was generalized in non-local configurations (Lai 2015).

and *iŋ-*) and Situ (resp.  $\eta\bar{a}$  and  $\eta\partial$ ). While this could suggest that the indexation suffixes might have been grammaticalized from pronouns (LaPolla 1992), other possibilities should be taken into consideration too (Jacques 2016b). In any case the second person prefix cannot be explained away as coming from a pronoun (Jacques 2012) at the Rgyalrongic or Kiranti stage.

Whatever the ultimate origin of the affixes themselves, the unusual indexation systems combining prefixes and suffixes found in Kiranti and Rgyalrongic are extremely unlikely to have been independently grammaticalized in the two groups (DeLancey 2014) and can thus be regarded as having the same origin.

## 2.2. The Rung vs Polysynthetic Sino-Tibetan hypotheses

The Rung hypothesis (LaPolla 2006; 2003; 2012; 2013)<sup>5</sup> argues that many person indexation systems found in ST languages are in fact parallel innovations. It nevertheless acknowledges that the systems of Rgyalrongic, Kiranti, Dulong/Rawang, West-Himalayan and Kham<sup>6</sup> are cognate and not due to parallel developments or contact. However, it considers them to be synapomorphies (i.e., shared innovations), and not symplesiomorphies (i.e., shared archaisms), and it thus argues that these languages form a “Rung” clade (Figure 1).

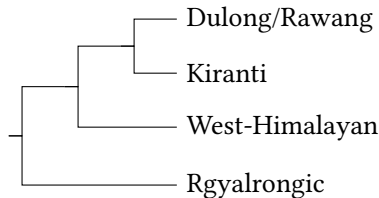


Figure 1. The Rung subgroup (LaPolla 2006: 394).

The Rung hypothesis is thus based on the interpretation of the presence of person indexation as a shared innovation, and Rung is defined as the subgroup including those languages exhibiting the set of person suffixes indicated in Table

5. The term “Rung” is due to Thurgood (1985), but LaPolla’s (2006) and Thurgood’s proposals are not completely identical. We will specifically focus here on LaPolla’s version of the Rung hypothesis.

6. Although LaPolla (2006) includes Kham in the proposed Rung subgroup, this language is found nowhere on the phylogenetic tree nor in the tables presented in LaPolla’s publications. Actually, not a single linguistic form of Kham is quoted anywhere.

4.7 The Rgyalrong group is assumed to have diverged from the others first, as it did not develop the reflexive/middle suffix found in Dulong, Kiranti and West Himalayan. In that view, languages lacking person indexation, such as Tibetan, Lolo-Burmese, or Chinese, simply never developed it.

Table 4. Morphological innovations defining the Rung group (LaPolla 2003)

	1SG	1PL	2PL	dual	reflexive/middle
proto-Rgyalrong	#-ŋ	#-i	#-ñ	#-tsh	
proto-Dulong-Rawang	#-ŋ	#-i	#-n	#-si	#-si
proto-Kiranti	#-ŋ	#-i	#-ni	#-ci	#-nsi
proto-West-Himalayish	#-g/-ŋ	#-ni	#-ni	#-si	#-si

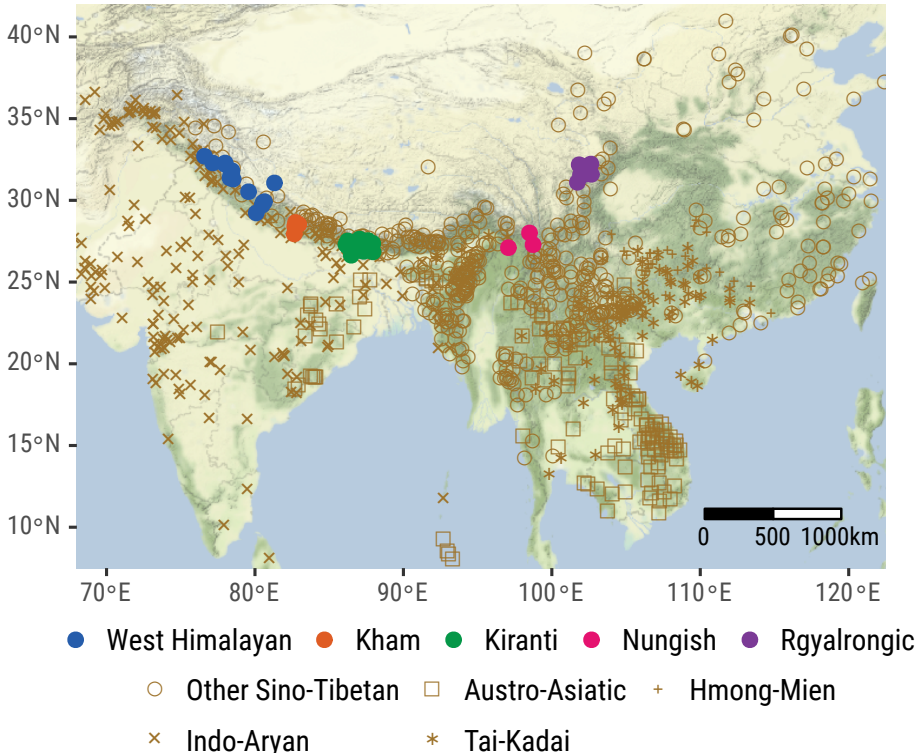
On the other hand, the **PPSTH** assumes that all languages without person indexation, or with a system obviously unrelated to that of Rgyalrong, Kiranti, and other conservative languages must have lost the original system. While total loss of morphology is a well-attested phenomenon especially in the case of intense language contact (DeLancey 2010a; 2015), the assumption that such a feature independently disappeared in most languages of the family can appear to be non-parsimonious, and in this respect, the Rung hypothesis may seem to be more parsimonious.

### 2.3. Geographical distribution

The languages with person indexation ascribed to the Rung group are not spoken in contiguous areas (Figures 2–3). While the Kham and Kiranti languages are both spoken in Nepal, the former are spoken in Western Nepal and the latter in Eastern Nepal and Sikki), and pre-modern contacts between speakers of these groups have yet to be documented. The Nungish (Dulong and Rawang) languages are stranded across the border between Northern Burma and Yunnan (China). Rgyalrongic languages are restricted to the Rngaba and Dkarmdzes prefectures of Sichuan (China).

The geographical distances separating the different Rung language groups are considerable (Table 5), even if one only considers geodesic distances, i.e., the

7. While the proto-Kiranti forms in Table 4 appear to be based on work such as van Driem (1993), it is unclear how the “proto-Rgyalrong” forms were arrived at; the verbal agreement suffixes in Rgyalrong languages present highly irregular correspondences (X. Gong 2014), and their reconstruction is by no means trivial.



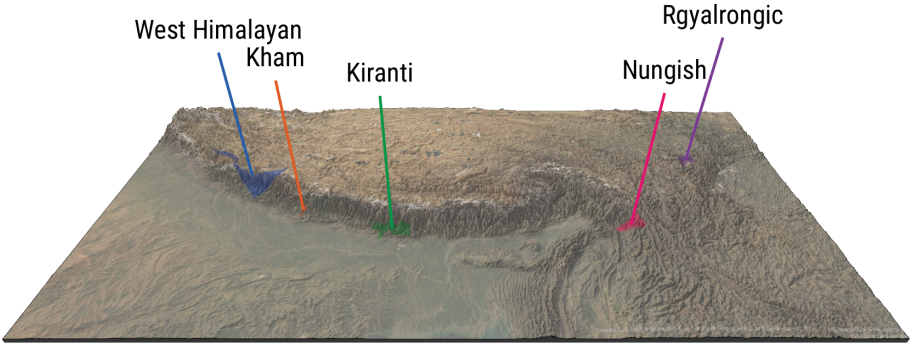
**Figure 2.** The Rung languages in their Asian context; geolinguistic data from [Glotlog](#), geographical data from [Stamen Maps](#)

shortest paths on the earth's surface, without taking into account natural obstacles. The whole Rung group is spread over around 2000 km from Rgyalrongic to West Himalayan, and there is an impressive gap of 906 km between the Kiranti and the Nungish groups. These languages are spoken in mountainous areas (Figure 3), which makes access and communication between them difficult.

The different Rung languages are not only spoken in areas geographically isolated from each other (in particular Rgyalrongic and Nungish), they are also linguistic islands since there is a great linguistic diversity between those areas. The Rung subgroups are split by various other [ST](#) languages of various branches, including Lolo-Burmese, Tibetan, and Jinghpo. Northeast India in particular shows an exceptionally high diversity ([Post & Burling 2017](#)).

The Rung hypothesis must therefore resort to ad hoc migration hypotheses in order to account for the fact that language groups with person indexation systems are spoken in non-contiguous areas. Since there is no additional historical, archaeological or even linguistic evidence supporting these migrations, these hy-





**Figure 3.** The Rung languages and their topographical environment; geolinguistic data from [Glottolog](#) ([Hammarström, Forkel & Haspelmath 2019](#)); elevation data from Mapzen and Global ETOPO1; terrain data from U.S. National Oceanic and Atmospheric Administration; satellite imagery from World Imagery by Esri, DigitalGlobe, Earthstar Geographics, CNES/Airbus DS, GeoEye, USDA FSA, USGS, AeroGRID, IGN, and the GIS User Community

**Table 5.** Minimum geodesic distance between languages of the different Rung subgroups (in km)

	West Himalayan	Kham	Kiranti	Nungish	Rgyalrongic
West Himalayan	—	248	609	1594	1945
Kham	248	—	340	1399	1834
Kiranti	609	340	—	906	1402
Nungish	1594	1399	906	—	464
Rgyalrongic	1945	1834	1402	464	—

potheses remain unsubstantiated. Any claim that the five Rung subgroups form a clade would need to be supported by strong and independent evidence.

### 3. Lexical innovations and the Rung hypothesis

The controversy between the Rung hypothesis and the [PPSTH](#) cannot be resolved on the basis of morphology only.

It is necessary to take into account linguistic evidence that is independent from the person indexation paradigms. We propose to focus here on lexical in-

novations in verbs.<sup>8</sup>

### 3.1. Recent phylogenetic studies and the Rung hypothesis

Two recent studies (Sagart et al. 2019; Zhang et al. 2019) have produced phylogenetic classifications of *ST* using Bayesian methods based on largely different lexical data. Both include Rgyalrongic, Kiranti, Nungish and West Himalayan languages in their dataset, but neither finds support for a Rung subgroup, or even a close relationship between Rgyalrongic and Kiranti (Figure 4).

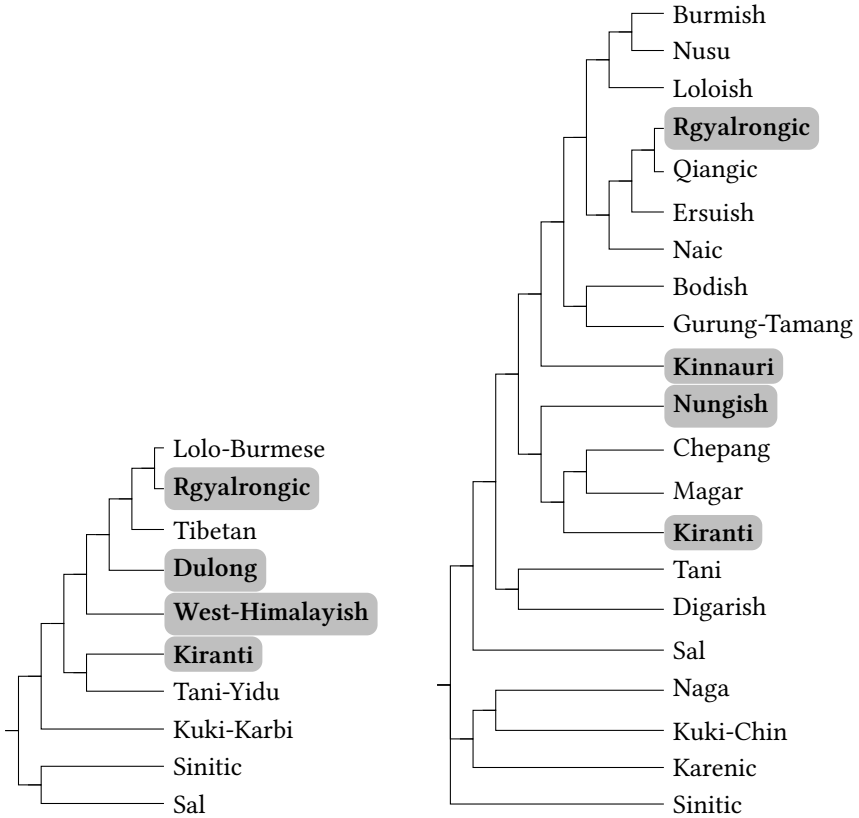
Zhang et al. (2019) found a very marginally supported (posterior probability 0.3) subgroup comprising Nungish, Kiranti, Chepang, and Magar, but not Rgyalrongic. Sagart et al. (2019) specifically discuss the Rung hypothesis<sup>9</sup> and found the posterior probability of a Rung subgroup comprising only Rgyalrongic, Nungish and Kiranti to be zero (Kham was not included in the dataset).<sup>10</sup> Instead, Rgyalrongic is consistently grouped together with Lolo-Burmese and Tibetan, which crucially lack person indexation.

### 3.2. Prediction of the Rung hypothesis

Though the two recent phylogenetic studies contradict the Rung hypothesis, they do not specifically discuss it. It is thus worthwhile to examine this hypothesis in more detail. The Rung hypothesis and the *PPSTH* entail different predictions about the lexicon of the language groups involved, and those predictions can be empirically tested.

While the *PPSTH* is not committed to any particular classification scheme, but assumes that Rgyalrong and Kiranti belong to distant branches of the family, the Rung hypothesis makes the following precise prediction, which we propose to test:

- 
8. An anonymous reviewer objected that lexicon and morphology are not independent, in particular since morphology can be grammaticalized from the lexicon. In the case of Rungic, the morphological evidence is limited to person indexation and the reflexive marker; the independence issue can be circumvented by not using as evidence lexical items that are known to be potential origins for person indexation or reflexive markers, i.e., personal pronouns, deictic elements, intensifiers or body parts such as 'head' or 'body' (Heine & Kuteva 2002).
  9. Supplementary information document, p. 18 (<https://www.pnas.org/lookup/suppl/doi:10.1073/pnas.1817972116/-/DCSupplemental>).
  10. There is likewise zero posterior probability for a Rgyalrongic-Nungish-Kiranti-West Himalayan, clade in the results of this article (Robin Ryder, p.c. 21 October 2019).



(a) Sagart et al. (2019)

(b) Zhang et al. (2019)

**Figure 4.** Two recent phylogenetic classifications of **ST** languages (branch length is not indicative here). Language groups assigned to the putative Rung subgroup are highlighted.

- (1) Rgyalrong, Nungish, Kiranti, Kham, and West Himalayan share common lexical innovations not found in any other *ST* language.

### 3.3. Testing the prediction of the Rung hypothesis

While the Rung hypothesis predicts that we should find lexical innovations exclusively shared by the languages of that putative group, only one such possible lexical innovation has been proposed hitherto (LaPolla 2013): the verb ‘to sit, to live’, Dulong *rùŋ*, Belhare *yur*. This is nevertheless invalidated by the fact that that item (STEDT #1906) has cognates outside of the proposed Rung group: Tani *\*dur* (Sun 1993) and Jingpo *tur*<sup>33</sup> ‘sit’ (Xú et al. 1983). This indicates that this verb is a retention from a higher node of the Sino-Tibetan tree.

Ideally, the Rung hypothesis should be tested by a full examination of all potential cognates between the putative Rung languages. However, this is difficult due to the number of languages involved and the lack of data on many varieties. Rather than aiming at exhaustivity, we focus on the potentially cognate verbal roots shared by a Rgyalrongic language (Japhug) and a Kiranti language (Khaling), on which the first author has first-hand experience and for which large amounts of lexical data are available (Jacques et al. 2015; Jacques 2015–2016). We do not discuss further the cases of Nungish, West-Himalayan, and Kham, and do not address the debate concerning the monophyly of Kiranti (Gerber & Grollmann 2018). This is not problematic for our purpose since any subset of the Rung languages is expected to share some innovations not attested in non-Rung languages.

The exclusion of nouns (and other parts of speech) is motivated by the fact that the historical phonology of verbal roots in Kiranti is much better understood than that of nouns, as the comparative method can be complemented with internal reconstruction (Jacques et al. 2012; Jacques 2017). Since nominal morphology in Khaling presents few alternations, such internal reconstruction is not possible for nouns, and also most nouns are opaque compounds whose etymology is not straightforward to determine. In addition, primary verbs in Kiranti are a closed class, with greater resistance to borrowings than nouns.

The Khaling verb dictionary (Jacques et al. 2015) contains 648 basic verb roots, from which reflexive and bipartite verbs can be built (the total number of verbs is about twice that figure), of which only 43 have cognates in either Japhug, Lolo-Burmese, Tibetan or Chinese (Table 6).<sup>11</sup> Middle Chinese is given

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11. The correspondences with Tibetan are based on the sound laws presented in Li (1933), Coblin (1976), Hill (2011), and Hill (2019). See also Zhang, Jacques & Lai (2019) for a discussion of the cognates shared by Rgyalrongic and Old Chinese.

in a modified version of Baxter’s (1992) transcription. Relevant references to Bradley’s (1979) proto-Lolo-Burmese and to STEDT are given with the corresponding numbers. Tibetan loanwords in Japhug are indicated between parentheses.

A few uncertain comparisons appear followed by a question mark in Table 6:

- Khaling  $|no\eta t|$  ‘accuse’ and Tibetan  $no\eta s$  ‘be in error’<sup>12</sup> differ in meaning, but in the Khaling form the additional  $-t$  is most probably an applicative suffix, so that it is possible to posit at an earlier stage an intransitive verb  $*|no\eta|$  ‘be wrong’ derived through the applicative as ‘consider to be wrong’ (tropative value of the applicative), hence ‘accuse’;
- Khaling  $|pu|$  ‘to dry on smoke’ can be compared to Japhug  $pu < *po$  ‘cook in ashes, burn’ (STEDT #348). Alternatively, it could correspond to the intransitive stative verb  $s\acute{p}u$  ‘be dry’ in Japhug and its Naish cognate  $*Spu$  (Jacques & Michaud 2011), but in this case an unidentified derivation would have to be hypothesized.
- it is unclear whether Khaling  $|t^ho|$  ‘to see’ corresponds to Tibetan  $lta$  ‘look’ or  $t^hos$  ‘hear’ (which would fit the phonology better), or to neither.

From Table 6, we observe that only one verb is exclusively shared between Japhug and Khaling:<sup>13</sup> Khaling  $|p^ber|$  ‘to flap wings’ and Japhug  $s\acute{y}p^h\acute{y}r$  ‘to brush off, to flap wings’.<sup>14</sup> However, the value of this comparison is somewhat lowered by the onomatopoeic character of this verb root; it is unclear whether this root should actually be reconstructed. All other verbs have either a Tibetan cognate, a Chinese cognate, or a cognate elsewhere in the family, as attested in the STEDT database.

We can also mention the existence of another verbal root apparently exclusively shared by Rgyalrongic and Kiranti, but not found in Khaling: the etymon reflected by Japhug  $ndzab$  ‘swim’ and Limbu  $ca:k-$  ‘cross, swim across’ (Michailovsky 2002).<sup>15</sup> While the inclusion of nouns and of data from other languages might reveal additional potential Rung cognates, the current evidence for Rung lexical innovations is near zero. The burden of proof is thus on the

12. See Hill (2008) on the uses of this Tibetan verb.

13. Cognates in languages other than Lolo-Burmese (LB), Japhug, Tibetan and Old Chinese (OC) are not indicated in the table, but can be retrieved by the reference to the cognate set in STEDT.

14. A relationship with the verb  $|b^her|$  ‘to fly’ is unlikely; there are examples of alternations between voiced and unvoiced aspirated stops in Khaling, but these involve a transitivity alternation (Jacques 2015).

15. Unvoiced stops and affricates in Limbu come from voiced obstruents (Michailovsky 1994; Jacques 2017), and are a good match for prenasalized obstruents in Japhug.

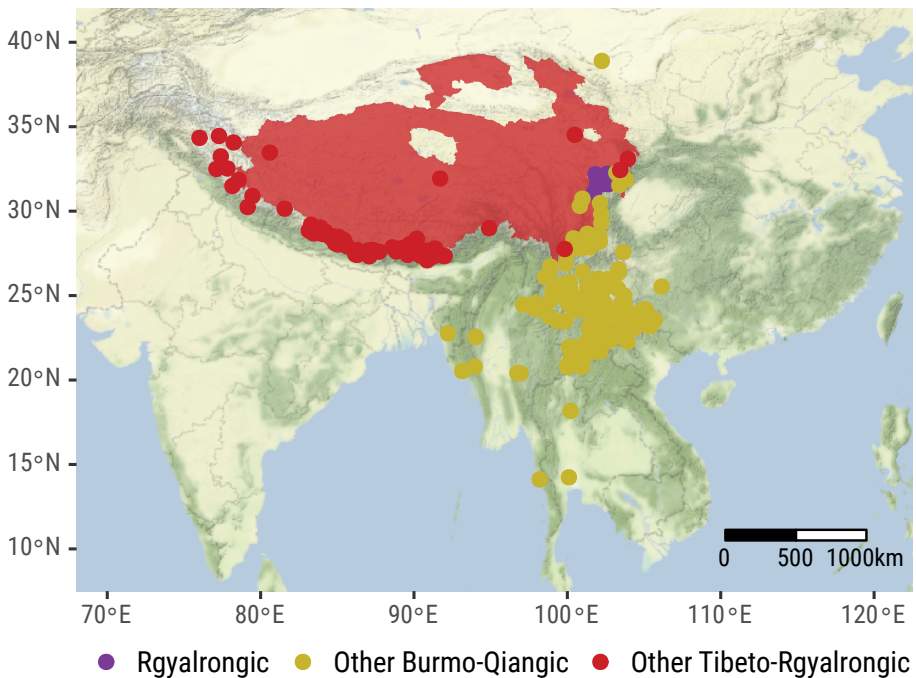
Table 6. Cognate verbs between Khaling, Japhug, Tibetan and Chinese

Khaling	meaning	LB	STEDT	Tibetan	Japhug	Chinese
1 <i>b<sup>her</sup></i>	vi 'fly'	399	2189, 2580	<i>b<sup>her</sup></i> 'flee'		
2 <i>bi</i>	vt 'give'	191	2556	<i>sb<sup>in</sup></i>	<i>mbi</i>	昇 <i>pjiH</i>
3 <i>d<sup>hum</sup></i>	vi 'be in good terms'			<i><sup>n</sup>dum</i>		
4 <i>dzA</i>	vt 'eat'	440	36	<i>za</i>	<i>ndza</i>	
5 <i>dz<sup>hur</sup></i>	vi 'be sour'	449	6079, 2379	<i>sk<sup>ur</sup></i>	<i>tcur</i>	酸 <i>swan</i>
6 <i>g<sup>huk</sup></i>	vi 'be bent'		2252	<i>gug.po</i>	<i>gɣɣ</i>	
7 <i>joŋ</i>	vi 'melt'					溶 <i>jowŋ</i>
8 <i>kA</i>	vt 'eat (hard)'		1777		<i>nɣŋka</i>	
9 <i>kak</i>	vt 'peel'		4451	<i><sup>n</sup>gog, bkog</i>	<i>qab</i>	
10 <i>kaŋt</i>	vt 'put on the oven'		119		<i>ck<sup>ho</sup></i>	炕 <i>k<sup>ha</sup>ŋH</i>
11 <i>k<sup>he</sup></i>	vi 'steal'	178	2365	<i>rku</i>	<i>muurku</i>	寇 <i>k<sup>hu</sup>wH</i>
12 <i>k<sup>hε</sup></i>	vi 'be bitter'		229	<i>kha</i>		苦 <i>k<sup>hɔ</sup>uX</i>
13 <i>k<sup>hri</sup></i>	vt 'guide'			<i><sup>n</sup>k<sup>h</sup>rid</i>		
14 <i>kik</i>	vt 'tie'	345	180	<i>bk<sup>i</sup>gs</i>		繫 <i>kejH</i>
15 <i>kur</i>	vt 'carry'			<i>bkur</i>	<i>fkur</i>	
16 <i>lak</i>	vt 'lick'	323	629	<i>ldzags</i>		食 <i>zik</i>
17 <i>lem</i>	vi 'sweet'		6152	<i>zim</i>		甜 <i>dem</i>
18 <i>lum</i>	vt 'half boil'		2420			
19 <i>min</i>	vi 'be cooked'	277	2449	<i>smin</i>	<i>smi</i>	
20 <i>mit</i>	vi 'die'	315	31			滅 <i>mjiet</i>
21 <i>moŋ</i>	vi 'dream'	268	126		<i>tu-jmŋo</i>	夢 <i>mjuwŋH</i>
22 <i>nom</i>	vl 'smell'	250	1415	<i>mnam</i>	<i>mnɣm</i>	
23 <i>noŋt</i>	vt 'accuse'			<i>noŋs ?</i>		
24 <i>nu</i>	vi 'be nice'	223				好 <i>xawX &lt; *ŋ<sup>h</sup>u?</i>
25 <i>ŋok</i>	vi 'cry'	185	1104	<i>ŋu</i>	<i>ɣɣwu</i>	
26 <i>ŋur</i>	vi 'roar'	400		<i>sŋur</i>	<i>(sŋur)</i>	
27 <i>p<sup>ber</sup></i>	vi 'flap wings'				<i>sy<sup>p</sup>ɣr</i>	
28 <i>p<sup>bi</sup>ŋ</i>	vt 'send'	282		<i>sprɪŋ</i>		
29 <i>p<sup>hle</sup>pt</i>	vt 'fold'		5475	<i>lteb</i>		疊 <i>dep</i>
30 <i>p<sup>hut</sup></i>	vl 'take off'			<i><sup>n</sup>bud, bud</i>	<i>p<sup>hut</sup></i>	
31 <i>pi</i>	vi 'fart'		311			屁 <i>p<sup>h</sup>jiH</i>
32 <i>pi, pit</i>	vi 'come, bring'	209	446		<i>ɣi, ɣut</i>	
33 <i>pu</i>	vt 'dry on smoke'		348		<i>pu</i>	
34 <i>rep</i>	vi 'stand'	35	145			立 <i>lip</i>
35 <i>ret</i>	vi 'laugh'		1108		<i>nɣre</i>	
36 <i>sel</i>	vt 'clean'		2671	<i>sel, bsal</i>		
37 <i>set</i>	vt 'kill'	136	1018	<i>gsod</i>	<i>sat</i>	殺 <i>set</i>
38 <i>ta</i>	vt 'put'	113	2682		<i>ta</i>	置 <i>tiH</i>
39 <i>tho</i>	vt 'see'			<i>lta, t<sup>h</sup>os?</i>		睹 <i>tuX</i>
40 <i>t<sup>h</sup>okt</i>	vt 'understand'			<i>rtogs</i>	<i>(rtob)</i>	
41 <i>tuŋ</i>	vt 'drink'		502	<i><sup>n</sup>t<sup>h</sup>uŋ</i>		
42 <i>won</i>	vi 'enter'	269	77	<i>joŋ</i>		往 <i>hjwayX</i>
43 <i>ɣipt</i>	vt 'put to sleep'	153	127		<i>nuzzuβ</i>	

supporters of the Rung hypothesis.

#### 4. Alternatives to the Rung hypothesis

The best way to refute a hypothesis is without doubt to propose a better hypothesis. We can thus examine alternative subgrouping hypotheses that are incompatible with the Rung hypothesis, such as Burmo-Rgyalrongic and Tibeto-Rgyalrongic, which can be shown to be better supported by the data and thus refute the Rung hypothesis.



**Figure 5.** The Tibeto-Rgyalrongic and Burmo-Qiangic languages; geolinguistic data from [Glottolog](#), geographical data from Stamen Maps. Tibetan is shown as an area rather than a single point in order to better represent its true distribution.

#### 4.1. Burmo-Rgyalrongic

The idea that Rgyalrongic and other Qiangic languages are closely related to Lolo-Burmese and Naish is not new: it has been previously independently proposed by a certain number of scholars, including [Dempsey \(1995: 13\)](#), [Bradley \(1997; “Eastern Tibeto-Burman”\)](#), [Peiros \(1998\)](#), [Li \(1998\)](#) and [Jacques & Michaud \(2011; “Burmo-Qiangic”\)](#). Despite the fact that Lolo-Burmese and Rgyalrongic are almost opposite in terms of typological features, since the former are nearly prototypically isolating, while the latter comprise the morphologically richest languages of the family ([Jacques 2016a](#)), lexical evidence strongly supports the hypothesis that they form a subgroup.

Both [Sagart et al. \(2019\)](#) and [Zhang et al. \(2019\)](#) found a posterior probability of 1 for Burmo-Rgyalrongic, including Rgyalrongic, Lolo-Burmese, and also Naish and Ersuic (the latter two were not included in [Sagart et al.’s 2019](#) database, due to the difficulty of establishing cognates). The supplementary materials in [Sagart et al. \(2019\)](#) present some of the potential innovations supporting this clade, reproduced here in [Table 7](#). These items are exclusively attested in Rgyalrongic and other Qiangic languages (such as Pumi, Muya, Zhaba and Queyu), Naish, Ersuic and Lolo-Burmese, and either non-attested elsewhere, or with an obvious semantic innovation restricted to Burmo-Rgyalrongic. [Table 7](#) provides for each cognate set an example from a Rgyalrongic and a Lolo-Burmese language, and the [STEDT](#) reference (showing the absence of cognates elsewhere in the family). Five of the cognate sets in the [Table](#) (the last five ones) have non-Burmo-Qiangic comparanda in [STEDT](#), and are discussed below.

**Table 7.** Potential lexical Burmo-Rgyalrongic innovations

Rgyalrongic	Lolo-Burmese	Reference
Japhug <i>u-byri</i> ‘front side’	Burmese <i>rhe?</i> ‘front side’	<a href="#">STEDT #1213</a>
Japhug <i>zdum</i> ‘cloud’	Burmese <i>tim</i> ‘cloud’	<a href="#">STEDT #5656</a>
Japhug <i>rku</i> ‘put in’	Lisu <i>ku</i> <sup>33</sup> ‘put in’ (* <i>?-kun</i> <sup>3/2</sup> )	<a href="#">Bradley (1979: 607)</a>
Stau <i>e-fku</i> ‘one year’	Lisu <i>khō</i> <sup>31</sup> ‘year’	<a href="#">STEDT #2252</a>
Japhug <i>ηu</i> ‘be’	Lisu <i>ηa</i> <sup>33</sup> ‘be’ (* <i>ηwa?</i> )	<a href="#">Bradley (1979: 698a)</a>
Japhug <i>yurni</i> ‘be red’	Burmese <i>nī</i> ‘red’	<a href="#">STEDT #2499</a>
Japhug <i>tu-rtsh</i> <sup>h</sup> yz ‘lung’	Burmese <i>ʔachut</i> ‘lung’	<a href="#">STEDT #458</a>
Khroskyabs <i>jmbjâm</i> ‘fly’	Burmese <i>pjam</i> ‘fly’	<a href="#">STEDT #2588</a>

First, the cognate set ‘red’ ([STEDT #2499](#)), includes two non-Burmo-Rgyalrongic



forms: Damu (Tani) *pa-tei-na* ‘scarlet red’ and Chinese *tʰiX* 耻 ‘shame’ (OC *\*ŋrəʔ*, Baxter & Sagart 2014). The former is difficult to evaluate without a more detailed description of this language, but if true it would be quite isolated in Tani, where the etymon for ‘red’ is rather *\*lurŋ* (in Sun’s 1993 system). As for the Chinese etymon, the comparison is not compelling in terms of phonology: OC *ə* normally corresponds to *-a* in non-Sinitic languages in most contexts, as noticed by many scholars (H.-c. Gong 1995, Hill (2012), Hill 2019: 30), and although not impossible semantically, it does not constitute strong evidence for an extra-Burmo-Qiangic cognate.

Second, the cognate set ‘lung’ (STEDT #458) contains one non-Burmo-Qiangic language: Hayu *dzot* ‘breathe, lung’. However, the cognacy between the Hayu word in the Burmo-Rgyalrongic etymon is by no means certain, given the discrepancy in initial consonant, and the isolation of this word in Kiranti.

Third, the cognate set ‘fly’ (STEDT #2588) includes several non-Burmo-Qiangic languages: Jinghpo *pjen*<sup>33</sup> ‘fly’, Taraon *jim*<sup>35</sup> ‘fly’, and Proto-Central Naga *\*a-jəm* (Mongsen *jim*, Chungli *a<sup>2</sup>-jəm<sup>2</sup>*, Bruhn 2014). The Jinghpo form is however better compared with Kiranti *\*ber* (Jacques 2017) and related forms (Jinghpo distinguishes labial and dental nasal codas, but merged *\*-r* and *\*-n* as *-n*).<sup>16</sup> As for the Taraon and the proto-Central Naga forms, the comparison is unsatisfying both in terms of vowels and initial consonants, and moreover the Burmo-Rgyalrongic etymon is better compared to Tibetan *<sup>n</sup>b'am* ‘spread’ and Chinese *phjomH* 浮 ‘float’, with a unidirectional semantic change ‘float’ > ‘fly’.

Fourth, the affirmative copula found in Rgyalrongic languages (Japhug *ŋu*, Khroskyabs *ŋæ*, Lai 2017: 247) is related to proto-LB *\*ŋwa<sup>1</sup>* ‘be the case’ (Bradley 1979: #698). This verb was originally an adjectival stative verb ‘be true’, a meaning still marginally preserved in Japhug (Jacques 2014a: 61). No verbal cognate is found outside of Burmo-Rgyalrongic, but Tibetan *ŋo.bo* ‘true nature’ shares the same root. Rgyalrongic and Lolo-Burmese here share a unidirectional semantic innovation ‘be true’ > copula.

Fifth, Stau (*e*)-*fku* ‘(one) year’ is related to Lolo-Burmese *\*C-kok (L)* ‘year’ (Bradley 1979: #477), with cognates in Naish, but not in Core Rgyalrong (Jacques & Michaud 2011, Jacques 2014a: 101). STEDT (#2252) proposes an etymological relationship with the verb ‘bend’ (reflected for instance by Japhug *kxy* ‘bend’), which if true would imply a common semantic evolution specific to West Rgyalrongic, Lolo-Burmese and Naish.

In addition, the cognate set represented by Japhug *ɕxy* ‘be new’ and Burmese *sac* ‘new’ (STEDT #6178) has cognates elsewhere in ST, but in other branches the

16. Alternatively, as pointed out by an anonymous reviewer, the Jinghpo verb could be a borrowing from Shan, though it is not included in Kurabe (2017).

coda is nasal (for instance Chinese *sin* 新 < \**siŋ*), and whatever the origin of the coda alternation (Hill 2019: 246), it is a Burmo-Rgyalrongic specificity.

The evidence presented in this section show that the results of Sagart et al. (2019) and Zhang et al. (2019) supporting a Burmo-Rgyalrongic clade are confirmed when a broader sample of lexical data is examined.

#### 4.2. Tibeto-Rgyalrongic

In addition to Burmo-Rgyalrongic, Sagart et al. (2019) found strong evidence for a “Tibeto-Rgyalrongic” clade,<sup>17</sup> with a posterior probability of 1 in the main analysis. Zhang et al. (2019) also have a clade encompassing Burmo-Rgyalrongic, Tibetan and Gurung-Tamang, but with only 0.35 posterior probability.<sup>18</sup>

Table 8 presents a list of lexical items exclusively shared by Tibetan (together with Tamangic and Bumthang-Kurtöp) and Burmo-Rgyalrongic. The etymon ‘blue, green’ (STEDT #2531) is compared with Kuki-Chin forms such as Thado *ηów-I*, *ηów-II* ‘fair skin, white’, but, given the semantic difference, it is not sure whether these etyma are actually related, and even if they are, the etymon found in Tibetan and Burmo-Rgyalrongic shows a common semantic shift, and thus still constitutes a common innovation.

Table 8. Potential Tibeto-Rgyalrongic lexical innovations

Tibetan	Rgyalrongic	Lolo-Burmese	STEDT
<i>ŋo</i> ‘blue, green’	Stau <i>ŋəŋə</i> ‘blue’	Old Burmese <i>ññuiv</i>	#2531
<i>gson.po</i> ‘alive’	Japhug <i>susu</i> ‘be alive’		#80
<i>rlon.po</i> ‘wet’, <i>bza</i> ‘wet’	Japhug <i>la</i> ‘absorb, soak’		absent
<i>snas</i> ‘heddle’	Japhug <i>ɕnat</i> ‘heddle’	Burmese <i>hnat</i>	absent
<i>m<sup>l</sup>oŋ</i> ‘experience’	Japhug <i>rpo</i> ‘experience’		absent
<i>p<sup>h</sup>rin</i> ‘message’	Japhug <i>tupri</i> ‘message’		absent
<i>gzob</i> ‘burn’, ‘burnt smell’	Japhug <i>yndzɿβ</i> ‘fire’		absent

17. Although “Tibeto-Burman” could be an apt name for this branch, this term has been used in such a variety of ways (van Driem 1997) that it is unwise to redefine it once again.

18. This lower support is possibly due to the fact that the STEDT database, on which Zhang et al. (2019) is based, does not identify Tibetan loanwords in non-Tibetic languages, hence obscuring the position of Tibetan, in particular by bringing it closer to the West-Himalayish branch, whose members have all heavily borrowed from Tibetan.

To these forms can be added Tibetan *gpen* ‘relative, friend’, a nominalized form (Jacques 2014b) of the adjective *pe* ‘near’ (STEDT #2496), which has an exact parallel in Japhug: *tuu-yɲi* ‘friend’. This example is particularly significant since it reflects a morphologically complex etymon with similar structure and semantic specialization in both Tibetan and Japhug. It is not borrowed from Tibetan in Japhug, otherwise a form †*ɣɲum* would be expected, following the sound laws described in Jacques (2004).<sup>19</sup>

Despite the fact that Tibeto-Rgyalrongic is slightly less well supported by Bayesian phylogenies than Burmo-Rgyalrongic, there is no dearth of potential lexical innovations shared by Tibetan and Rgyalrongic (and/or Lolo-Burmese).

## 5. Conclusion

The Rung hypothesis that the Rgyalrongic, Nungish, Kiranti, Kham, and West Himalayan languages form a subgroup defined by shared innovations is not supported by recent Bayesian phylogenetic studies (Zhang et al. 2019; Sagart et al. 2019) nor by a more thorough investigation of their shared lexicon. On the other hand, strong support is found in favor of the alternative Tibeto-Rgyalrongic and Burmo-Rgyalrongic hypotheses, which instead assume a closer relationship of Rgyalrongic with Tibetan and Lolo-Burmese than with Nungish, Kiranti, Kham, and West Himalayan.

This closer relationship of Rgyalrongic with Tibetan and Lolo-Burmese entails that the person indexation morphology shared by Rgyalrongic, Kiranti, and some other languages is not a recent innovation but an archaic feature that goes back at least to their most recent common ancestor, and that it was subsequently and independently lost in languages such as Tibetan and Lolo-Burmese. The Rung hypothesis can thus be rejected, and the possibility of reconstructing a rich person indexation system for *proto-Sino-Tibetan* needs to be seriously considered.

Debates similar to the controversy addressed here are found in other language families, in particular Niger-Congo (Güldemann 2008; Hyman 2011) and Austroasiatic (Zide & Anderson 2001; Donegan & Stampe 2004). Our work suggests that the reconstructibility of morphology is essentially a question of phylogenetic nature: morphological features with low propensity for homoplasy yet shared by a set of languages are reconstructible at least to their common ancestor. In order to prevent circular reasoning, however, it is crucial to avoid using morphological features (or more generally structural features, Greenhill et al.

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19. Final *\*-n* is lost in Rgyalrongic native words.

2017) in this procedure: phylogenies built to evaluate the antiquity of *morphological* features should be strictly based on *lexical* innovations. Consequently, deep questions of morphological typology cannot be successfully addressed without preliminary studies on sound laws and etymology.

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## Affiliation

Guillaume Jacques (ORCID: 0000-0003-1220-2323)

Thomas Pellard (ORCID: 0000-0001-6189-1677)

CNRS-EHESS-Inalco, CRLAO

2, rue de Lille

75007 PARIS

France

Guillaume.JACQUES@cnrs.fr

thomas.pellard@cnrs.fr

## Résumé en français

Le sino-tibétain (trans-himalayen) est l'une des familles de langues les plus diverses au monde d'un point de vue typologique, l'une des rares à inclure tous les degrés de complexité morphologique, de l'isolant jusqu'au polysynthétique.

La question de savoir si la morphologie riche qui se trouve dans certaines langues doit être reconstruite jusqu'à l'ancêtre commun du sino-tibétain, ou s'il s'agit d'une innovation tardive limitée à un sous-groupe « rung », ne fait pas consensus.

Dans cet article, nous proposons que cette question est fondamentalement un problème de phylogénie, et que les résultats de certains travaux récents sur la phylogénie du sino-tibétain, complétés par une étude plus détaillée des innovations lexicales partagées, apportent un soutien à l'idée que l'indexation personnelle n'est pas une innovation récente et que les langues qui en sont dépourvues sont donc innovatrices.

## Zusammenfassung auf Deutsch

Sino-Tibetisch (Trans-Himalayanisch) ist eine der typologisch vielfältigsten Sprachfamilien der Welt, eine der wenigen, die alle Gradienten morphologischer Komplexität von isolierend bis polysynthetisch umfassen. Es besteht noch kein Konsens darüber, ob die reiche Morphologie, die sich in einigen Sprachen findet, insbesondere die Personenindexierung, im Ur-Sinotibetischen rekonstruiert werden sollte oder ob es sich um eine spätere Neuerung handelt, die sich auf eine bestimmte Rung-Untergruppe beschränkt und diese definiert.

In dieser Arbeit argumentieren wir, dass diese Frage grundsätzlich ein phylogenetisches Problem ist und dass die Ergebnisse neuerer Arbeiten zur Phylogenie des Sino-Tibetischen, ergänzt durch eine verfeinerte Untersuchung gemeinsamer lexikalischer Innovationen, die Hypothese unterstützen, dass die Morphologie der Personenindexierung keine neuere Innovation ist und dass die Sprachen, denen ein solches Merkmal fehlt, somit innovativ sind.

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