From denominal derivation to incorporation☆

Guillaume Jacques

CNRS-INALCO-EHESS, CRLAO, France

Abstract

This article investigates the synchronic status and diachronic origin of an incorporation-like construction in Japhug, a polysynthetic Sino-Tibetan language of Eastern Tibet. This construction constitutes the intermediate stage on a path of development from denominal derivation to incorporation, the opposite of the usual path of development from incorporation to denominal derivation.

Additionally, this article shows that similar phenomena exist in other languages, and that coalescence between noun and verb is not the only attested diachronic origin of incorporating verbs.

© 2012 Elsevier B.V. All rights reserved.

1. Introduction

This article deals with the diachronic origin of incorporation and its relationship to denominal derivation, drawing examples from Japhug Rgyalrong, a polysynthetic language belonging to the Sino-Tibetan family.

Most studies dealing with incorporation in a diachronic perspective (for instance Mattissen, 2006; Haugen, 2008; Mithun, 2009) discuss the development of new constructions (denominal derivation, manner or classifier morphemes, etc.) out of incorporation, rather than the origin of incorporation itself.

Mithun (1984:872) suggests that the genesis of incorporation is the result of the coalescence of nouns (especially indefinite direct object) with the verb, and this observation is certainly valid for most incorporating languages. In languages where the incorporated noun is always the outermost element of the verb, the explanation of incorporation in terms of coalescence is obvious and hardly deserves a justification.

The present study will however show that incorporation does not always derive from coalescence of noun and verb, but originates in some cases from denominal derivation. This pathway of development is exemplified in Japhug, where incorporation is a relatively recent phenomenon, but traces of it can be found in other languages.

This article is divided into five parts. First, we provide a definition of incorporation to distinguish it from related but distinct phenomena. Second, we provide a detailed description of an incorporation-like construction in Japhug.

Third, we describe denominal derivation in Japhug and its similarities with the incorporation-like construction.

Fourth, we analyse the development pathway that led to the creation of the incorporation-like construction in Japhug, and evaluate whether this construction represents true incorporation.

Fifth, we propose to distinguish two types of incorporation in cross-linguistic perspective, direct (the classical type) and indirect (the type observed in Japhug), and show the existence of indirect incorporation in Germanic languages.

2. Incorporation and its relationship to other morphological phenomena

The term "incorporation" is generally used, according to Mithun (1984:848)'s definition, to designate a "particular type of compounding in which a V and N combine to form a new V". Such a definition allows for broad or narrow interpretations, depending on one's understanding of "compounding", "verb" and "noun". Since this article discusses the diachrony of incorporation and its relationship to related but distinct constructions, it is preferable to opt for a more restrictive definition, following Sapir (1911), Gerdts (1998) and Mattissen (2003:169).

We define incorporation as the compounding of a nominal root with a verbal root into a verb, on the conditions that (1) both the nominal and the verbal stems in question exist as independent words (even with morphophonological changes), (2) the resulting incorporational construction can occur in finite forms, (3) the resulting incorporational construction constitutes both a phonological and a morphological word, (4) verbs and nouns are clearly distinct parts of speech in the language in question (without excluding cases of noun/verb homophony).

This definition can distinguish genuine incorporation from three processes that some authors have analysed as incorporation: denominal derivation, noun stripping and lexical affixes.

First, denominal derivation and incorporation are related concepts, and the term "incorporation" is sometimes used to include both verbs deriving from nouns and compound verbs built from a nominal and a verbal root (see in particular the debate between Mithun, 1984, 1986 and Sadock, 1980, 1986). As Sadock and other authors such as Haugen (2008) have argued, in some language families, especially Eskaleut and Uto-Aztecan, denominal derivation and incorporation present systematic parallelism, and denominal verbs can even be analysed as a sub-class of incorporating verbs, one in which the verb root "requires incorporation of a nominal root or stem for morphophonological reasons" (Haugen, 2008:120). Mithun (2009:13), discussing Eskaleut data, objects that even though denominal verbs in these languages are historically derived from incorporating verbs, the fact that the verb root cannot appear independently precludes analysing it as incorporation synchronically. Her data includes a few examples in which the same root appears both as an independent verbal root and as a suffix, such as Central Alaskan Yupik *atuʁ–* "to use, to sing, to wear" (Fortescue et al., 2010:57) and the corresponding suffix (postbase) *–tuʁ–* "eat X", less commonly "use, wear" (Fortescue et al., 2010:473). According to our definition of incorporation, the Eskaleut denominal suffixes that have no verbal equivalent should not be analysed as incorporation, but examples of the suffix *–tuʁ–* cited by Mithun should, even though the morphological shape of the suffix is not entirely predictable from the base verb and some semantic differences can be discerned.

We propose the following definition for denominal verb derivation: a morphological process that derives a verb out of a noun either by (1) addition of an affix and/or non-concatenative morphology, (2) zero-derivation. In cases where the affix is etymologically related to a free verb like the postbase *–tuʁ–* "eat X" in Yupik mentioned above, it is preferable to analyse the construction as incorporation rather than denominal derivation.

Second, some authors consider noun stripping to be a form of incorporation: Mithun (1984:849–854) analyses as noun stripping cases where a noun is juxtaposed to a verb without any element occurring in between and loses its syntactic status as an argument of the sentence while remaining a phonologically independent word. Our definition of incorporation excludes such cases, though as pointed out by Mithun (1984:872), incorporation might originate from noun stripping by progressive coalescence of a nominal and a verbal root.

Third, in Northwest North American languages such as Wakashan and Salish, lexical affixes with meanings corresponding to nouns or adverbs in European languages can be attached to the verb; these lexical affixes strongly resemble incorporation at least in function. However, these affixes generally have no synchronic relationship with free lexical elements, and even when they do, the fact that Salishan and Wakashan languages lack a strong noun–verb distinction makes it difficult to determine with confidence whether a particular compound is a verb–verb or a noun–verb compound. However, the situation is different in the case of Algonquian, a family with a very strong verb–noun distinction. In Algonquian languages, the so-called MEDIAL stems (Goddard, 1990) are (generally nominal) lexical affixes, some of which have a clear relationship with the corresponding free noun. Incorporating verbs in Algonquian follow the general template:

(1)   INITIAL + MEDIAL + FINAL

Only INITIAL roots can appear on their own; they can be either verbal or nominal. FINAL roots are mainly derivational morphemes, in particular voice and valency markers.

Consider the following examples of incorporating verbs in Ojibwe (data from Nichols and Nyholm, 1995); the MEDIAL is indicated in bold. All of these examples share the final –*e* of intransitive animate verbs:

(2)   *ikwe*– "woman" > *miigaad-**ikwew**-e* "beat (one's) wife" (compare *miigaadi*– "fight each other"),
        Nichols and Nyholm, 1995[64]
        inini– "man" > *nawad-**iniw**-e* "grab people" (compare *nawadin*– "grab s.o."), Nichols and Nyholm, 1995[93]
        ʒhiishiib– "duck" > *nandaw-**ishib**-e* "hunt ducks", Nichols and Nyholm, 1995[92]
        anim– "dog" > *nandaw-**isimw**-e* "look for horses", Nichols and Nyholm, 1995[92]

The relationship between the free noun (the INITIAL root) and the MEDIAL is in some cases quite transparent, as in *ikwe*– > –*(i)kwew*– "woman" (the final etymological –*w* shows up in the plural *ikwewag* "women"). In most cases, however, the MEDIAL is not predictable (*inini*– > –*iniw*– "man" and *ʒhiishiib*– > *(i)shib* "duck") or even entirely obscure synchronically *anim*– > –*(i)simw*– "dog, horse".[1]

However, despite the unpredictable morphophonological processes taking place when deriving a medial from the free root, these examples constitute incorporation according to our definition. The case of Wakashan and Salishan is more complex and will not be discussed in this article (see Gerdts, 2003 and also Gerdts and Hukari, 2008 concerning the Salish language Halkomelem).

Aside from the cases discussed above, our definition excludes cases such as English "go berry-picking" which can occur with participles but not finite forms at least not in the standard language.[2]

Any definition is at least in part arbitrary, and we do not wish to imply that authors such as Haugen (2008) or Baker (2009) were "wrong" in designating as incorporation phenomena which we would call otherwise. The only important question is whether a particular comparative concept is clear or ambiguous, and whether it is useful for analysing data.

The survey of the literature above shows that previous authors have proposed two paths of development related to incorporation.

First, the development of denominal derivation from incorporation, when an incorporating verb ceases to be usable without an incorporated noun:

(3)   INCORPORATION > DENOMINAL DERIVATION

Second, the development of incorporation from noun stripping, by coalescence of the noun and the verb stems into one phonological word:

(4)   NOUN-VERB COALESCENCE > INCORPORATION

The following will show that (4) is not the only path of development leading to the creation of incorporation.

3. An incorporation-like construction in Japhug

Incorporation is a rather unusual process among languages of the Sino-Tibetan family. Mithun (1984:853) has argued, quoting data from Matisoff (1973:309), that some constructions in the Lolo-Burmese language Lahu could be analysed as incorporation, but as mentioned in section 2, we exclude noun-stripping from our definition of incorporation.

In the morphologically richer languages of the Sino-Tibetan family, there is evidence for the existence of incorporation, especially in Kiranti (see for instance Schackow, 2008:92 concerning Puma), but also in the ancient language Tangut (Jacques, 2011).

Japhug, a morphologically complex language belonging to another subgroup of Sino-Tibetan (Rgyalrong), presents a peculiar incorporation-like construction which will be the focus of this article. This construction (henceforth ILC) resembles incorporation superficially and was analysed as such in previous publications such as Jacques (2004, 2012b). At the same time, it presents affinities with denominal derivation (as will be shown in section 5), and we defer discussion of its exact status until sections 5 and 6.

---

[1] The bare INITIAL *anim*– does not normally occur in Ojibwe; the common noun for "dog", *animosh* is a diminutive of an earlier **anim* < **aɬemwa* "dog" which fell out of use in Ojibwe but whose cognates still exist and other Algonquian languages. The MEDIAL –*(i)simw*– comes from proto-Algonquian **–(e)ʔɬemw*–. The resemblance between the MEDIAL and the INITIAL is manifest in the proto-language, but no longer apparent in modern Ojibwe.
[2] A search on the Internet however reveals that sentences such as "he berry-picks it" are possible in some colloquial varieties of English: this constitutes incorporation.

Fig. 1. Rgyalrong languages.

In this section we first give a short presentation of the Japhug language. Second, we provide a general overview of Japhug morphosyntax. Third, we present all examples of ILC verbs in Japhug: this construction is of limited productivity, so that an exhaustive list can be included in this article. Fourth, we describe some morphological and syntactic properties of the ILC.

3.1. The Japhug language

Japhug (Chinese 茶堡 Chabao) is an endangered Sino-Tibetan language spoken by less than 10,000 speakers in Western Sichuan, China. It belongs to the Rgyalrong subgroup of Sino-Tibetan (as defined by Sun, 2000). Alongside Japhug, three other languages are found in the Rgyalrong group: Situ (or Eastern Rgyalrong), Tshobdun (Chinese 草登 Caodeng) and Zbu (Chinese Ribu 日部, also called Showu).

The following map presents the Rgyalrong-speaking area in shaded grey, in which the Japhug-area appears as a black dot (Fig. 1).

Rgyalrong languages are unwritten, except for some ancient texts in Situ in Tibetan script. Until the 1950s, these languages where under Amdo Tibetan influence, which is still conspicuous in the vocabulary, but now few speakers know Tibetan, while most of them are bilingual in Sichuan Chinese.

3.2. Overview of Japhug morphosyntax

Before studying the incorporation-like construction in detail, it is necessary to provide a general account of the main typological properties of the Japhug language.[3]

Japhug is a polysynthetic language, with obligatory person marking for two arguments and a direct/inverse system (see DeLancey, 1981; Sun and Shidanluo, 2002; Jacques, 2010). The verb distinguishes between singular, dual and plural, but not inclusive/exclusive. Transitivity (a feature of crucial importance for our study of incorporation) is marked in five different ways:

---

[3] The reader can also refer to Jacques (2008), a preliminary grammar of Japhug, as well as to Sun (2003), a sketch of Tshobdun, the closest relative of Japhug.

Table 1
The Japhug verbal template.

a-	mu- mɤ-	ɕu- ɣu-	tɤ- pu- etc.	tu-	wɣ-	ʑɣɤ-	su-	rɤ-	nɤ-	a- sɤ-	nu-	ɣɤ- ru-	noun	Σ	-t	-a	-nu -ndʑi
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

1. Irrealis *a–*, Interrogative *ɯ́–*, conative *ju–*.

2. negation *ma– / mɤ– / mu– / múj–*.

3. **Translocative/Cislocative** *ɕu–* **and** *ɣu–*.

4. Directional prefixes (*tɤ–pu– lɤ– tʰu – kɤ– nu–jɤ– tu– pju–lu– cʰu – ku– ɲu–ju–*) permansive *nu–*, apprehensive *ɕu–*.

5. Second person (*tu–*, *kɯ–* 2>1 and ta- 1>2).

6. Inverse *-wɣ-* / Generic S/O prefix *kɯ-*, Progressive *asɯ-*. Note that the inverse is actually *infixed* within the progressive as in *ɲu-tu-ɣ́<wɣ>su-zgroʁ* CONST-2-PROG< INV> -attach "he is attaching you".

7. Reflexive *ʑɣɤ–*.

8. Causative *su–*, Abilitative *su–*.

9. Antipassive *sɤ– / rɤ–*.

10. Tropative *nɤ–*, applicative *nu–*.

11. Passive or Intransitive thematic marker *a–*/Deexperiencer *sɤ–*.

12. Autobenefactive-spontaneous (appears in this position only when the passive/intransitive determiner is present, otherwise appears between positions 6 and 7) *nu–*.

13. Other derivation prefixes *nu– ɣu– ru– nɤ– ɣɤ–rɤ–*.

14. Noun root.

15. Verb root.

16. Past 1sg/2sg transitive *-t* (aorist and evidential).

17. 1sg *–a*.

18. Personal agreement suffixes (*–tɕi, –ji, –nu, –ndʑi*).

1. The transitive aorist direct 3>3 prefix *a–*.

2. The transitive aorist 1/2sg>3 *–t* suffix (only occurs in open-syllable stem verbs).

3. The stem 3 formation, a stem alternation which occurs in direct 123sg>3 forms of verbs. The regular pattern is that verbs whose stem is in *–o*, *–u*, *–a* and *–ɯ* change to *–ɤm*, *–e*, *–e* and *–i*, respectively.

4. The generic A form (which cannot occur on intransitive verbs).

5. The A participle construction which differs from the S participle by the presence of a possessive prefix coreferent with the patient; compare the two phrases:

(5) *kɯ-si*
     NMLZ:S/A-die
     'The dead one'

(6) *ɯ-kɯ-sat*
     3SG-NMLZ:S/A-kill
     'The one who kills him.'

Tense–Aspect–Modality is marked by a combination of several series of directional prefixes with vowel alternation on the verb root. The structure of the verbal word is more templatic than layered (following Bickel and Nichols, 2007:218's definition) and the basic template is the following (Table 1).

Japhug and other Rgyalrong languages are typologically unusual in being verb-final languages with mainly prefixing morphology. It is quite common to find a verb form with more than four or five prefixes in a row:

(7) *a-ɣu-lɤ-ku-su-mtsʰam-a*
     IRR-CISL-PFV:upstream-2>1-CAUS-hear-1SG
     You will come to tell me. (Japhug; The three sisters, 132)

Derivational morphology is also extensive: argument-promoting (causative, applicative, tropative), demoting (passive, antipassive, anticausative, etc.) and modal (abilitative, facilitative) derivations are all attested and fairly productive (see for instance Jacques, 2012b or Sun, 2006 on the related Tshobdun language).

Japhug is a strongly head-marking language, and its case marking system is rather poor: it only has an ergative clitic *kɯ*, an optional genitive *ɣu* and an optional locative *zu*.

From the point of view of alignment typology, Japhug has ergative marking on nouns, tripartite alignment in relativization and ergative alignment in generic marking (cf Jacques, 2012b).

Table 2
Pronouns and possessive prefixes in Japhug.

Free pronoun	Prefix	
aʑo	*a–*	1SG
nɤʑo	*nɤ–*	2SG
uʑo	*u–*	3SG
tɕiʑo	*tɕi–*	1DU
ndʑiʑo	*ndʑi–*	2DU
ʑɤni	*ndʑi–*	3DU
iʑo	*i–*	1PL
nuʑo	*nu–*	2PL
ʑara	*nu–*	3PL

Japhug has a strong distinction between nouns and verbs, a feature, which as we have argued in section 2, is a prerequisite for the existence of incorporation. Nouns, unlike verbs, exhibit little morphology except possessive prefixes, whose paradigm is given in the following table, compared to the free pronouns (these prefixes also occur in some participial verb forms) (Table 2).

Some intrinsically possessed nouns, especially body parts, kinship terms and relational nouns, must appear with either a possessive prefix or the indefinite possessive *tɯ–* or *tɤ–*.

Finally, we are going to address the definition of wordhood in Japhug, which is crucial to any discussion on derivational morphology. In some languages of the Sino-Tibetan family such as Galo (see Post, 2009) it has been shown that the phonological and morphological boundaries are not always congruent. In Limbu, Hildebrandt (2007) and Schiering et al. (2010) have suggested that a phonological boundary exists between prefixes and the rest of the verbal word, as indicated by two phonological rules (glottal-stop insertion and non-application of l/r alternation).

In Japhug, there is also some evidence for the existence of a phonological boundary within the morphological verbal word.

Unlike other Rgyalrong languages (see Sun, 2005), Japhug has lost tonal and stress contrasts, and the stress always falls on the last syllable of the word, except in two cases.

First, some verbal prefixes, in particular the inverse *–wɣ–*, attract stress on the preceding syllable, as in the following example:

(8) *pú-wɣ-mto-a-ndʑi*
     AOR-INV-see-1SG-DU
     They[d] saw me. (elicitation, Chen Zhen).

Second, personal agreement suffixes are always unstressed and the vowels of these suffixes are often devoiced[4]:

(9) *pɯ-mtó-t-a-ndʑi*   [*pɯmtótḁndʑi̥*]
     AOR-see-PST-1SG-DU
     I saw them[d]. (elicitation, Chen Zhen).

In our transcription of Japhug, stress is only indicated in the case of stress-attracting prefixes, as its placement is always predictable otherwise.

Stress in Japhug is a valuable indicator of phonological domains, and the facts presented above suggest that a phonological boundary exists between the verb stem and the agreement suffixes, in other words between position 16 and position 17 of the verbal template.[5]

In Limbu and most other Kiranti languages, Schiering et al. (2010) argued that /ʔ/-insertion between verbal prefixes and vowel-initial root (as in /kɛ-im/ 2-sleep "you sleep" realized as [kɛʔim]) was a marker of phonological boundary. In Japhug, no such insertion is observed: vowel fusion between the prefix and the verb stem always occurs. For instance, the second person non-past form of /aɕqʰe/ "to cough" is /tɯ-ɤɕqʰe/ 2-cough [tɤɕqʰe], not *tɯʔaɕqʰe. All other elements occurring to the

---

[4] The only exception is the first person singular suffix *–a* when it merges with the verb stem, as in *tɤ-aɕqʰe-a* AOR-cough-1SG "I coughed" realized as [taɕqʰjá].

[5] See Gong (in press) for a similar claim concerning Zbu Rgyalrong.

right of the second person prefix and to the left of the verb root (positions 7–14, including all derivation prefixes as well as nominal roots) belong unequivocally to the same phonological word.

3.3. Incorporation-like verbal compounds

Japhug presents verbal compounds that superficially resemble incorporational constructions. These verbal compounds include a nominal and a verbal root, both of which can appear independently, are not restricted to non-finite forms and belong to the same phonological word, as defined in the previous section. Therefore, they would seem to fulfil the definition of incorporation presented in section 2. However, we will see in the following sections that these compounds also show some affinities with denominal derivations. Their exact status will be discussed in sections 5 and 6, and we will non-committally refer to this construction as incorporation-like construction (ILC) in this article.

Unlike other derivational processes, ILC verbs are not very numerous in Japhug: only 36 have been discovered up to now out of a total of 1800 verbs in our unpublished lexical database. Although ILC is fairly rare in traditional stories, these examples show that this process is still productive, as it applies not only to native vocabulary, but also to Tibetan (*fsoʁ* ''earn'' <Tibetan *bsogs*), *ɯ-ɲɤm* ''flesh'' < *nyam*) and Chinese (*tʂʰa* ''tea'' 茶 chá, *pɕawtsɯ* ''money'' 票子 piàozi) loanwords. Chinese loanwords are almost all extremely recent, dating from after 1950.

In the following Table 3, noun roots in ILC verbs are written in bold, and separated from other morphemes by a hyphen. For each ILC verb, we list the base noun and verb from which it is built. Note that some of the nouns are intrinsically possessed nouns, and must appear with a possessive prefix (here systematically given as the third person *ɯ–*) or the indefinite possessive *tɯ–*.

Verbs for which we have indicated *idiom* as the meaning only appear in noun–verb collocations with the same noun as in the ILC verb. For instance *tɯ-ʑi loʁ* is an idiom meaning ''have nausea'':

(10)   *ɯʑo*   *ɯ-ʑi*   *ɲɯ-loʁ*
        he   3SG.POSS-nausea   CONST-have.nausea
        He has nausea. (elicitation, Dpalcan)

Neither the noun *tɯ-ʑi* nor the verb *loʁ* can appear outside of this collocation, though they behave morphologically like independent words, but the ILC equivalent *ɲɯ-ʑɯ-loʁ* ''have nausea'' constitutes a single word.

The morphological and morphosyntactic properties of these ILC verbs will be analysed in the next sections (3).

Aside from the 35 examples above, a special case must be made of the verb *kɤtɯpa* ''to speak''. This verb etymologically includes the verbal root *–pa*, which originally meant ''to do'', but has become restricted in modern Japhug to the meaning ''to close (the door)'' or as a light verb with ideophones. The first part *kɤtɯ–* is an ablauted form of *kɤ-ti* the patient participle of the verb *ti* ''to say'' and literally means ''the things that are said'' (in some contexts it also means ''niggling'').

kɤtɯpa is a defective verb, and only occurs in non-past first and third person forms. It is morphologically transitive, and undergoes *–a > –e* ablaut in singular forms. Table 4 compares the non-past (direct, i.e. with a third person patient) forms of the transitive verb *ndza* ''to eat'' with those of *kɤtɯpa*.

The non-past being the only tense which is not prefixed in Japhug, we observe that the only attested forms of this verb are precisely those which are not prefixed; in other words, the verb *kɤtɯpa* ''to speak'' is one of the few verbs in the language (alongside the highly irregular *ɣɤʑu* ''to be there'' and *maŋe* ''not to be there'') which cannot appear with any prefix.

3.4. Morphological properties

All ILC verbs in Japhug except *kɤtɯpa* ''to speak'' exhibit a very strict morphological structure, which we can represent as follows:

DERIVATIONAL PREFIX   NOMINAL STEM   VERBAL STEM
ɲɯ–, nɤ–, ɣɯ–, sɤ–

A few examples such as *nɯtʂɤqɤsti* ''to block the way'' present more than one nominal element, but we will first restrict the discussion to this basic structure. This structure, interestingly, is the mirror-image of the Algonquian incorporation construction INITIAL + MEDIAL + FINAL mentioned in section 2.

The nature of the derivational prefixes is analysed in more detail in section 5; it will be shown that these prefixes are homophonous with denominal prefixes, and that the ILC presents affinities with denominal constructions.

Table 3
Examples of ILC in Japhug.

Base noun	Meaning	Base verb	Meaning	ILC verb	Meaning
tɯ-ku	head	*amtɕoʁ*	pointed (vs)	*a-kɤ-mtɕoʁ*	having a pointed head
cʰa	alcohol	*tsʰi*	drink (vt)	*ɣɯ-cʰɤ-tsʰi*	to drink alcohol
cɯ	stone	*pʰut*	take out, cut down (vt)	*ɣɯ-cɯ-pʰut*	to take out stones (out of the field)
tɯ-ɣli	dung	*tɕɤt*	take out (vt)	*ɣɯ-ɣlu-tɕɤt*	to take out dung (out of the stable), to make fertilizer)
ɣndʑɤɣβ	fire (big)	*ta*	put (vt)	*ɣɯ-ɣndʑɤɣβ-ta*	to clear (fields) with fire
kʰɯna	dog	*tsʰoʁ*	attach (vt)	*ɣɯ-kʰɯ-tsʰoʁ*	to turn the dog loose on
pɕawtsɯ	money	*fsoʁ*	earn	*ɣɯ-pɕawtsɯ-fsoʁ*	to earn money
tɯ-rʝu	riches	*fsoʁ*	earn	*ɣɯ-rʝu-fsoʁ*	to earn riches
si	tree, wood	*pʰut*	take out, cut down (vt)	*ɣɯ-sɯ-pʰut*	to cut wood (to make firewood)
tʂʰa	tea	*tsʰi*	drink (vt)	*ɣɯ-tʂʰɤ-tsʰi*	to have tea
tʂu	way	*mtsʰi*	lead (vt)	*ɣɯ-tʂɤ-mtsʰi*	to lead the way
tɤ-jlɤβ	steam	*sqa*	cook (vt)	*nɤ-jlɤβ-sqa*	to cook with steam (vt)
tɯ-ku	head	*tɕʰu*	gore (vt)	*nɤ-kɤ-tɕʰu*	to hit with the head (vt)
tɯ-zgrɯ	elbow	*tɕʰu*	gore (vt)	*nɯ-zgrɯ-tɕʰu*	to hit with the elbow (vt)
ɯ-mpʰru	one after the other	*ʐa*	start (vt)	*nɤ-mpʰru-ʐa*	to do after after the other
tɤ-pʰɯ	clod (of earth)	*xtsɯ*	pound (vt)	*nɤ-pʰɯ-xtsɯ*	to break clods of earth
ɯ-qa	root	*ʐa*	start (vt)	*nɤ-qa-ʐa*	to start from the beginning (vt)
ɯ-qʰu	back, behind	*ru*	look	*nɤ-qʰa-ru*	to look back
ɯ-qʰu	back, behind	*ŋga*	wear (vt)	*nɤ-qʰɤ-ŋga*	to wear on the back
tɯ-ʑi	nausea	*loʁ*	(idiom)	*nɤ-ʑɯ-loʁ*	to have nausea
jla	hybrid yak	*lɤɣ*	herd (vl)	*nɯ-jlɤ-lɤɣ*	to herd hybrid yaks
jla	hybrid yak	*mtsʰi*	lead (vt)	*nɯ-jlɤ-mtsʰi*	to lead hybrid yaks
mbro	horse	*rʝɯɣ*	run	*nɯ-mbrɤ-rʝɯɣ*	to gallop
tɯ-nŋa	debt	*tʂo*	pay	*nɯ-nŋɤ-tʂo*	to pay back one's debt
tɯ-rʝu	wealth	*sŋom*	pay	*nɯ-rʝu-rŋom*	to envy people's wealth
ɯ-ɲɤm	flesh	*kʰe*	(idiom)	*nɯ-ɲɤm-kʰe*	to be skinny
ɯ-ɲɤm	flesh	*sɯ*	plump	*nɯ-ɲɤm-sɯ*	to be plump
paʁ	pig	*lɤɣ*	herd (vl)	*nɯ-paʁ-lɤɣ*	to herd pigs
ɯ-pʰaʁ	side	*ɲɤl*	(not independent)	*nɯ-pʰaʁ-ɲɤl*	to lay on the side
ɯ-qʰu	behind	*astu*	straight	*nɯ-qʰɤ-stu-stu*	to back up
tɯ-rma	household	*kro*	share	*nɯ-rmɤ-kro*	to split the household
tɤ-rme	hair	*mbe*	old	*nɯ-rmɤ-mbe*	to moult
tɯ-sni	heart	*ɲaʁ*	black	*nɯ-snɯ-ɲaʁ*	to harm
zrɯɣ	louse	*ru*	look	*nɯ-zrɯɣ-ru*	to look for lice
tʂu	road	*sti*	block	*nɯ-tʂɤ-qɤ-sti*	to block the way
tɯ-mbrɯ	anger	*ŋgu*	(idiom)	*sɤ-mbrɯ-ŋgu*	to be detestable
tɯ-ʑi	nausea	*loʁ*	(idiom)	*sɤ-ʑɯ-loʁ*	to be disgusting

For the time being we remain non-committal as to whether ILC constitutes true incorporation or a different construction altogether, and will therefore avoid using the term ''incorporation'' until section 5, when all the facts have been laid out and analysed. The verbs showing this construction will be called ''ILC verbs'' and the nominal stem that appears in this construction ''ILC nominal stem'' (rather than ''incorporated noun'').

The nominal stem in the ILC differs from the free form in two ways. First, in the case of possessed noun prefixes with either the indefinite possessive prefix *tɯ–* / *tɤ–* or the third person prefix *ɯ–*, this prefix disappears in the ILC. Second, in open-syllable nouns, the vowel undergoes a series of regular changes, which we call the *status constructus* (5).

The *status constructus* of some nouns is irregular, in particular the noun ''dog'' *kʰɯna* which becomes *kʰɯ–* instead of expected **kʰɯnɤ–*. Not only possessive prefixes are lost during derivation, but also derivational prefixes as in *tɯ-nŋa* ''debt'' a noun derived from *nŋa* ''owe'' by the action nominalization prefix *tɯ–*. The only case of a prefix preserved in the construct state in Table 3 is that of *ɣndʑɤɣβ* ''fire''. This noun is an irregular nominalization of *ndʑɤɣβ* ''to burn (vi)'', an anticausative derivation of the transitive *tɕɤβ* ''burn (vt)''. The regular form *kɯ-ndʑɤɣβ* is also attested; *ɣ–* originates from *kɯ–* by syncope (a cluster such as /kndʑ/ would be impossible in Japhug). The reason for the preservation of this *ɣ–* element is that it is not felt synchronically as a prefix anymore.

The *status constructus* is not limited to ILC verbs, but also occurs in nominal compounds (6).

The first element is always a noun in *status constructus*, and the second element undergoes little change, except for the loss of possessive prefixes.

Table 4
Paradigm of the verb *kɣtɯpa* "to speak".

Person	"to eat"	"to speak"
1SG	*ndze-a*	*kɣtɯpe-a*
2SG	*tɯ-ndze*	XX
3SG	*ndze*	*kɣtɯpe*
1DU	*ndza-tɕi*	*kɣtɯpa-tɕi*
2DU	*tɯ-ndza-ndʑi*	XX
3DU	*ndza-ndʑi*	*kɣtɯpa-ndʑi*
1PL	*ndza-j*	*kɣtɯpa-j*
2PL	*tɯ-ndza-nɯ*	XX
3PL	*ndza-nɯ*	*kɣtɯpa-nɯ*

Table 5
Status constructus.

Basic noun	Incorporated noun
−*a*	−*ɣ* / −*a*
−*o*	−*ɣ* / −*a*
−*e*	−*ɣ* / −*a*
−*u*	−*ɣ* / −*a*
−*i*	−*ɯ*

Table 6
Examples of noun compounds with *status constructus*.

Element 1	Meaning	Element 2	Meaning	Compound noun	Meaning
tɯ-ku	head	*tɣ-rme*	hair	*tɯ-kɣ-rme*	hair (on the head)
tʂu	road	*tɣ-mtʰum*	meat	*tʂɣ-mtʰum*	provision of meat for the road

The presence of a distinct bound form for nominal stems in ILC, and the fact that this bound form also occurs in nominal compounds, are characteristics also attested in many languages with incorporation, in particular the Algonquian examples discussed in section 2.

3.5. Syntactic properties

ILC verbs are not common in traditional stories, so that a detailed study of the function of this construction is difficult.

The ILC nominal stem cannot be modified by either stranded demonstratives or adjectives as in languages such as Hopi (see for instance Haugen, 2008:121), and it is never referential. Although ILC retains some degree of productivity, attempts at creating new ILC verbs on the model of the ones discovered in the stories met with disagreement by the speakers. For instance, while *nɯ-jlɣ-lɣɣ* "herd hybrid yaks" and *nɯ-paʁ-lɣɣ* "herd pigs" are possible, it is impossible (or at least not fully acceptable) to produce a verb such as **nɯ-qaʑɣ-lɣɣ* "herd sheep", probably because such an activity is not in Rgyalrong culture "recognized sufficiently often to be considered name-worthy in its own right", as Mithun (1984:848) puts it.

The ILC nominal stem can have three functions:

(11)   O of a transitive verb: *ɣɯ-**sɯ**-pʰɯt* "cut wood".
         S of an intransitive verb: *a-**kɣ**-mtɕoʁ* "be pointy-headed".
         Adjunct: *nɣ-**qʰa**-ru* "look back".

Note that no examples of A have been discovered: the Japhug ILC follows the well-known implicational hierarchy of incorporating constructions, according to which "if a language incorporates nouns in just one function, they will be direct objects; if a language incorporates only two types of arguments, they will be direct objects and subjects of intransitive verbs" (Aikhenvald, 2007:19).

When the ILC nominal stem corresponds to the O of the original verb, the ILC verb becomes intransitive: this is a situation similar to saturating incorporation (type I incorporation according to Mithun (1984)'s hierarchy). Compare the two following competing constructions:

(12)   *nɯ-nɯ-**nŋɤ**-tʂo-a*
        AOR-DERIVATION-**debt**-pay-1SG

(13)   *a-nŋa*   *nɯ-tʂo-t-a*
        1SG.POSS-debt   AOR-pay-PST-1SG
        I paid my debt. (elicitation, Chen Zhen)

In example 13 without ILC, the verb *tʂo* ''to pay'', is transitive, as shown the presence of the past suffix *–t*, which only occurs in 1SG>3 and 2SG>3 forms of transitive verbs. In the corresponding ILC verb in example 12, the verb cannot appear with this suffix *–t*, showing that it was intransitivized by the process of incorporation.

When the ILC nominal stem corresponds to the S of the original verb, the verb remains intransitive. In at least one example, the same nominal root appears both within the ILC verb and as the free noun S-argument (*tɯ-ku* ''head'' becomes *–kɤ–* in *status constructus*):

(14)   (i)   *ɯ-**ku***   *ɲɯ-ɤmtɕoʁ*
              3SG-**head**   CONST-pointed
        (ii) *ɯ-**ku***   *ɲɯ-ɤ-**kɤ**-mtɕoʁ*
              3SG-**head**   CONST-DERIVATION-**head**-pointed
              Its head is pointed (of a knife). (elicitation, Dpalcan)

When the ILC nominal stem corresponds to an adjunct, the verb remains transitive in some cases, as in *nɤkɤtɕʰɯ* ''hit with the head'':

(15)   *kɤ́-wɣ-nɤ-**kɤ**-tɕʰɯ-a*
        AOR-INV-DERIVATION-**head**-gore-1SG
        He hit me with his head. (elicitation, Dpalcan)

However we have found no case of ILC similar to Mithun's type II incorporation, when a verb incorporating an O argument remains transitive, and promotes an adjunct to O role.

Although the meaning of some of the ILC verbs is not compositional, in other words one cannot guess the exact meaning of the verb from that of the ILC nominal stem and the verb, some ILC verbs are quite transparent in this regard. This is for instance the case of *ɣɯ-pɕawtsɯ-fsoʁ* ''earn money'', a recent ILC verb since it contains a Chinese loanword.

We find the following two examples a few sentences apart in the same story:

(16)   *ɬasa*   *ju-kɯ-ɕe*   *tɕe,*   *nɯtɕu*   *pɕawtsɯ*   *kɤ-fsoʁ*   *ɲɯ-mbat*
        Lhasa   IPF-GENR:S/O-go   COORD   there   money   INF-earn   CONST-easy
        'If one goes to Lhasa, it is easy to earn money there.' (Lobzang, 22)

(17)   *nɤ-mbro*   *nɤ-rŋul*   *tɯ-rke-a*   *tɕe*   *kɯ-ɣɯ-pɕawtsɯ-fsoʁ*   *jɤ-ɕe*   *tɕe*
        2SG.POSS-horse   2SG.POSS-silver   IPF-put.in[3]-1SG   COORD   NMLZ:S/A-DERIVATION-money-earn   IMP-go   COORD
        ''I will prepare a horse and some silver for you, go and earn some money.' (Lobzang, 17)

In the first example, *pɕawtsɯ* ''money'' is the free object of the transitive verb *fsoʁ* ''earn''. In the second sentence, we find the corresponding ILC verb. In both cases, the Noun–Verb construction and the ILC verb could have been substituted one for the other without any noticeable change of meaning.

Interestingly, an important proportion (more than half) of textual examples of compositional ILC verbs such as these are found as non-finite verbal forms especially as complements of movement verbs:

(18)   *tɯ-sɲi*   *ci*   *zɯ*   *nɯ,*   *tɤ-tɕɯ*   *nɯ*   *li*   *kɯ-ɣɯ-sɯ-pʰɯt*   *lɤ-ari*
        one-day   INDEF   LOC   TOP   NEU-boy   TOP   again   NMLZ:S/A-DERIVATION-wood-chop   AOR:UPSTREAM-go[II]
        ɲɯ-ŋu,
        CONST-be
        'One day, the boy went again to chop wood.' (The demon, 7)

Table 7
List of denominal prefixes in Japhug.

Form	Transitivity
nɯ–, nɤ–	intransitive and transitive
rɯ–, rɤ–	intransitive and transitive
ɣɯ–, ɣɤ–	intransitive and transitive
sɯ–	transitive verb with instrument, intransitive verb of position
mɤ–	transitive verb with body part, intransitive verb of position
sɤ–	intransitive verb (property)
aɣɯ–	intransitive verb (property)

Table 8
Proportion of transitive and intransitive verbs.

Form	Transitivity	
	vi	vt
nɯ–, nɤ–	44	46
rɯ–, rɤ–	28	4
ɣɯ–, ɣɤ–	6	8
sɯ–	2	5
mɤ–	2	3
sɤ–	2	0
aɣɯ–	12	0

These ILC verbs differ from constructions such as English *go berry-picking*, as they can be fully conjugated, but the prevalence of these verbs in non-finite forms in spontaneous speech deserves a more detailed study. More conversations and traditional stories need to be collected in order to be able to undertake meaningful statistical studies.

4. Denominal derivation in Japhug

Japhug has a very rich system of denominal derivations, which cannot be treated exhaustively in this article. All denominal verbs are derived from nouns by means of a derivational prefix. The attested prefixes are the following (7).

Many denominal verbs are derived from intrinsically possessed nouns, which always bear either a possessive prefix or an indefinite possessor prefix tɯ– or tɤ–. The vocalism /ɯ / or /ɤ/ of the denominal prefixes depends on whether the base noun has tɯ– or tɤ–, though there are a few exceptions. For instance, from tɤ-ʑri "dew" one can derive nɤ-ʑri "be covered with dew" (vi), while from tɯ-ʑɯβ "sleep (n)" one derives nɯ-ʑɯβ "sleep (vi)". However, numerous exceptions to this general principle exist; in particular, the vowel /ɯ/ tends to be realized closer to [ɤ] next to a uvular consonant.

There are several pairs where nɯ– / nɤ– derives a transitive verb while rɯ–/ rɤ– derives an intransitive one, such as tɯ-krɤz "discussion" > nɯkrɤz "discuss (vt)" vs. rɤkrɤz "discuss (vi)".

However, the transitivity of the derived verb is not always predictable from the form of the prefix. Table 8 illustrates the transitivity of the denominal verbs depending on their derivational prefix (the numbers refer to occurrences in my unpublished Japhug dictionary).

Discussing in detail the semantic properties of each prefix would require considerable space and will not be attempted in this article. We will only focus on the functions of the five forms that denominal verbs and incorporating verbs have in common: nɯ–, nɤ–, ɣɯ–, sɯ– and sɤ–.

The prefix nɯ– and its variant nɤ– appear in a considerable variety of verbs, as illustrated in Table 9.

The prefix nɯ– can derive four major types of verbs, though some (such as "to be pregnant") cannot be easily classified into any category.

First, nɯ– derives intransitive stative verbs denoting a property related to the base noun, as in "to be rusty" and "to be of a correct price".

Second, nɯ– is used to create intransitive verbs describing an activity whose purpose is to obtain the entity designated by the base noun, as in "to fish" or "to receive a salary"; the meaning is never "to make X" or "to become X".

Third, the prefix nɯ– derives transitive action verbs from instrument nouns (as in "to plane" or "to treat").

Fourth, nɯ– forms transitive verbs meaning "to consider as, to treat as" relative to the base noun.

The prefix ɣɯ– is much less common than nɯ–. The following examples illustrate its main functions (Table 10).

Table 9
Examples of the denominal prefix *nɯ–*.

Base noun	Meaning	Derived verb	Meaning	
ɯ-pʰɯ	price	*nɯ-pʰɯ*	to be of a correct price	vi, stative
sɣa	rust	*nɯ-sɣa*	to be rusty	vi, stative
qaɟy	fish	*nɯ-qaɟy*	to fish	vi
tɯ-ŋgra	salary	*nɯ-ŋgra*	to receive a salary	vi
mtʰɯ	spell	*nɯ-mtʰɯ*	to cast a spell	vt
kɯjŋu	oath	*nɯ-kɯjŋu*	to swear	vt
mbɯrlɣn	plane	*nɯ-mbɯrlɣn*	to plane	vt
smɣn	medicine	*nɯ-smɣn*	to treat	vt
mkɣɣur	necklace	*nɯ-mkɣɣur*	to wear as a necklace	vt
tɯ-rdoʁ	a piece	*nɯ-rdoʁ*	to pick up piece by piece	vt
ʁjoʁ	servant	*nɯ-ʁjoʁ*	to give orders to	vt
ʁgra	enemy	*nɯ-ʁgra*	to treat as an enemy	vt
tɯ-skʰrɯ	body	*nɯ-skʰrɯ*	to be pregnant of	vt

Table 10
Examples of the denominal prefix *ɣɯ–*.

Base noun	Meaning	Derived verb	Meaning	
tɣ-tsrɯ	sprout	*ɣɣ-tsrɯ*	to sprout	vi
ɕoɲtɕa	timber	*ɣɯ-ɕoɲtɕa*	to chop timber	vi
tɯ-tɕʰa	message	*ɣɯ-tɕʰa*	to answer	vt
ɕkat	load	*ɣɯ-ɕkat*	to load (an animal)	vt
tɣ-fkɯm	bag	*ɣɯ-fkɯm*	to put in a bag	vt

The allomorph *ɣɣ–* only occurs with intransitive verbs expressing the generation of the entity designated by the base noun (as in "to sprout"). Some uses of *ɣɯ–* seem to be identical to that of *nɯ–*. For instance, the case of "to chop timber" is similar to that observed with the verb *nɯ-qaɟy* "to fish" above. Verbs such as *ɣɯ-ɕkat* "to load" and *ɣɯ-fkɯm* "to put in a bag" on the other hand exemplify a type of derivation slightly different from that of *nɯ–*, meaning especially "to put in a container", the container being the base noun.

The prefix *sɯ–* appears in two cases. First, with body parts or instruments, where it derives a labile or a transitive verb expressing the action of that instrument (*tɯ-jaʁndzɯ* "finger" > *sɯ-jaʁndzɯ* "show with the finger"). Second, with nouns expressing a position such as *ndzɯpe* "way of sitting (without crossing legs, the way women sit in the Rgyalrong traditional society) > *sɯ-ndzɯpe* "sit (without crossing legs, vi)".

4.1. Deexperiencer/tropative pairs

Aside from the three groups of prefixes *nɯ–/ nɣ–*, *ɣɯ–* and *sɯ–* discussed above, we must mention the case of the deexperiencer / tropative pairs in *sɣ– / nɣ–* (see Table 11 for examples of these prefixes and definitions of these terms), in relation to the pair of ILC verbs *sɣ-ʑɯ-loʁ* "to be disgusting" and *nɣ-ʑɯ-loʁ* "to have nausea" derived from the collocation *tɯ-ʑi loʁ* "to have nausea".

The deexperiencer prefix *sɣ–* derives an intransitive stative verb from either transitive (perception verbs) or intransitive verbs, and the S of the deexperiencer verbs corresponds to the *stimulus* of the base verb, while the original S or A is

Table 11
Examples of the deexperiencer and tropative verbs.

Basic verb	Meaning	Derived verb	Meaning
ŋgio	to slip	*sɣ-ŋgio*	to be slippery (of the ground)
ɕke	to be burned	*sɣ-ɕke*	to be burning
rga	to like (itr.)	*sɣ-rga*	to be nice
wxti	to be big	*nɣ-wxti*	to consider to be too big
zri	to be long	*nɣ-zri*	to consider to be too long
mnɣm	to have an odour	*nɣ-mnɣm*	to smell (tr.)

Table 12
Deexperiencer/tropative pairs.

Deexperiencer verb	Meaning	Tropative verb	Meaning	Noun	Meaning
$sɤ$-re	to be ridiculous	$nɤ$-re	to laugh (labile)	$tɤ$-re	laughter
$sɤ$-$mts^hɤr$	to be strange	$nɤ$-$mts^hɤr$	to consider (vt) to be strange	$tɤ$-$mts^hɤr$	strange event
$sɤ$-$ŋɤβ$	to be such that people are reluctant to do it	$nɤ$-$ŋɤβ$	to be reluctant to (vt)		

demoted (see Jacques, 2012b). The tropative derivation derives a transitive verb from a stative verb, by adding an experiencer (which becomes the A of the derived verb) while the S of the original verb becomes the O. This derivation differs from the causative in that the resulting verb always has the specific meaning ''to find / consider XXX''.

Apart from the two ILC verbs $sɤ$-$ʑɯ$-$loʁ$ ''to be disgusting'' and $nɤ$-$ʑɯ$-$loʁ$ ''to have nausea'', we find three pairs of verbs which present the same apparent meaning derivation (Table 12).

The verb $nɤ$-re is labile, meaning ''to laugh at (someone)'' when used transitively, and ''to laugh'' when used intransitively.

The first two verb pairs $sɤ$-re / $nɤ$-re and $sɤ$-$mts^hɤr$ / $nɤ$-$mts^hɤr$ are similar, related to base nouns prefixed in $tɤ$–. Note that the prefix in these nouns is the indefinite possessive, which disappears when a possessive prefix is added:

(19)　$ɯ$-re　　　　　ci　　　$ɕmɯɣ$　　　$ɲɤ$-$ɕlɯɣ$,
　　　3SG.POSS-laughter　a.little　IDEO:1:laughter　EVD-drop
　　　She (could not resist and) laughed a little. (The Frog, 100)

For the pair $sɤŋɤβ$ / $nɤŋɤβ$ on the other hand, no corresponding noun seems to exist, though it could have existed or be attested in other varieties of Japhug.

It would appear that the pairs of verbs in Table 12 are derived from the nouns, and thus that the deexperiencer and tropative prefixes can be used as denominal markers alongside their regular use. However, from a comparative point of view, the root of $tɤ$-re ''laughter'' is clearly verbal in origin (see for instance Tangut $rjijr^2$, proto-Lolo-Burmese $*ray^1$, both ''to laugh'', Matisoff, 2003:43). Besides, $tɤ$-$mts^hɤr$ is a loanword from the Tibetan $mts^har.ba$ ''to be fabulous, to be strange''. This suggests that $tɤ$-re ''laughter'' and $tɤ$-$mts^hɤr$ ''strange event'' are deverbal nouns, and that unattested verbal roots $*re$ and $*mts^hɤr$ must have existed at an earlier stage.

The following scenario can be postulated to explain these forms. If we assume the existence of an intransitive verb $*are$ ''to laugh'' (intransitive) with the thematic element a–,[6] its regular deexperiencer would be $*sɤ$-are > $sɤ$-re.

One can also regularly derive from $*are$ ''to laugh'' the deverbal noun $tɤ$-re ''laughter (n)''; such examples are quite common, for instance the derivation $aɕq^he$ ''to cough'' > $tɤ$-$ɕq^he$ ''cough (n)''.

Finally, $nɯ$-are > $nɤre$ ''to laugh at'' would be the regular applicative (not tropative) of the verb $*are$.[7] This hypothetical form $*are$ in turn would be derived from a root $*re$ ''to laugh at (tr)'', in the same way as ak^hu ''to call'' must originate from a transitive root $*k^hu$ ''to call (transitive)''. The Tangut and Lolo-Burmese forms reflect the non-derived root $*re$, while the Japhug forms have undergone several layers of derivation.

The disappearance of $*are$ (and other comparable forms) makes the formation quite opaque.

For $sɤ$-$ʑɯ$-$loʁ$, we need to posit a further step of derivation: first inclusion of the noun $ɯ$-$ʑi$ in a hypothetical ILC verb $*a$-$ʑɯ$-$loʁ$ ''to have nausea (it)'', to which then deexperiencer ($*sɤ$-$aʑɯloʁ$ > $sɤʑɯloʁ$) and applicative ($*nɯ$-$aʑɯloʁ$ > $nɤʑɯloʁ$) derivations are then applied.

4.2. Light verb constructions

Most denominal verbs compete with corresponding light verb constructions. In these constructions, the light verb (mostly $βzu$ ''to do'', $lɤt$ ''throw'' but also ti ''say'' in some cases) receives TAM and person marking, while the noun is a regular object.

The following examples illustrate denominal vs. light verb constructions:

---

[6] This thematic element appears on many intransitive verbs, including stative ($amtɕoʁ$ ''pointed'', $artɯm$ ''round'') and dynamic ones ($aɕq^he$ ''to cough'', $atɯɣ$ ''to meet''). It historically originates from an intransitivizer (still reflected in the passive derivation a–) but synchronically the a– in these verbs must be analysed as a part of the stem, as no corresponding prefixless verb exists.

[7] Other examples of applicative $nɯ$– with a– initial verb stems include $aʑɯʑu$ ''to wrestle (vi)'' (intrinsically reciprocal verb) > $*nɯ$-$aʑɯʑu$ > $nɤʑɯʑu$ ''to wrestle with (vt)''.

(20) (i)   *tʰɯ-nɯ-rɣɣo-a*
            AOR-DENOMINAL-song-1SG
      (ii) *rɣɣotʰɯ-βzu-t-a*
            song AOR-do-PST-1SG
            I sang. (elicitation, Chen Zhen)

(21) (i)   *nɯ-sɯ-ndʑɯpe-a*
            AOR-DENOMINAL-way.of.sitting-1SG
      (ii) *ndʑɯpe   nɯ-βzu-t-a*
            way.of.sitting AOR-do-PST-1SG
            I sat (without crossing legs). (elicitation, Dpalcan)

In both examples, the first sentence has an intransitive denominal verb, while the second one has a light verb construction.

In Japhug, TAM marking relies on both verb stem alternation and directional prefixes. Except for movement verbs and some action verbs, which are compatible with all seven directions (up, down, upstream, downstream, east, west, undetermined), most verbs have a determined directional prefix. In the case of *nɯrɣɣo* "sing" and *sɯndʑɯpe* "sit" above, the aorist form of the lexical directional prefixes are respectively *tʰɯ–* "downstream" and *nɯ–* "towards west".[8]

The same directional prefixes are found in both the denominal construction and the corresponding light verb constructions, showing that these two constructions are synchronically related to one another in a systematic way: In the light verb construction *ndʑɯpe **nɯ**-βzu-t-a*, one finds the same *nɯ–* "towards west" prefix as in the denominal **nɯ**-*sɯ-ndʑɯpe-a* "I sat without crossing legs".

Many denominal verbs (especially those in *nɯ–* and *rɯ–*) can be replaced by the corresponding light verb construction without significant change of meaning.

4.3. Denominal prefixes and ILC

The derivational prefixes which appear in ILC verbs, *nɯ–*, *nɣ– ɣɯ–*, *sɯ–* and *sɣ–*, all have corresponding homophonous denominal prefixes. One could indeed argue that the two groups are related.

It could further be proposed that some of the denominal and/or ILC prefixes have the same origin or even constitute synchronically the same markers as some verbal derivations, in particular the applicative *nɯ–* and the causative *sɯ–*.

Yet, the phonetic resemblance between these prefixes alone is not enough to draw such a conclusion. In Japhug, the shape of prefixes is determined by various phonological constraints. With the exception of directional prefixes and one modal prefix, both derivational and inflectional prefixes never have consonant clusters, only have /a/, /ɣ/, /ɯ/ as their main vowel, and contain only one of the following eleven consonants: /s/, /z/, /ɕ/, /ʑ/, /ɣ/, /m/, /n/, /r/, /t/, /k/, /j/ (the complete consonantal inventory of Japhug comprises 49 phonemes).

Therefore, we observe pervasive homophony among prefixes. For instance, *nɯ–* can be either denominal, applicative, spontaneous-autobenefactive, aorist directional "towards west", vertitive, third/second person plural prefix, as in the following examples:

1. *rga* "to like (vi)" > *nɯ-rga* "to like (vt)" (applicative)
2. *rpu* "to bump" > *nɯ-rpu* "to bump one's (body part)" (spontaneous-autobenefactive)
3. *ɣi* "to come" > *nɯ-ɣe* "come (towards west), aorist" (directional prefix)
4. *ɣi* "to come" > *nɯ-ɣi* "to come back" (vertitive)
5. *mto* "to see" > *nɯ-kɯ-mto* "the one who sees them" (third/second person plural)

A similar list could be established with *sɣ–*, which can occur as non-core nominalizer, deexperiencer, combination of causative and passive, deriving transitive de-ideophonic verbs, antipassive and denominal prefixes. It is implausible that all these functions could have a common diachronic origin; their resemblance is (for some of them at least) fortuitous and due to the phonotactics of prefixes, which undergo different sound laws than regular vocabulary and neutralize many phonological distinctions (voicing, aspiration, main vowel, etc.).

Therefore, the question which needs to be addressed is whether the denominal and ILC derivational prefixes are only superficially similar, or whether they are related.

---

[8] These prefixes are simply glossed as "aorist" AOR, since the direction for these verbs is lexically determined.

5. Incorporation-like construction as denominal derivation

The previous sections have described the formation of ILC and denominal verbs in Japhug, and we have observed that both groups of verbs present an important commonality: The presence of a series of homophonous derivational prefixes. The existence of these prefixes offers a clue as to the origin of ILC in Japhug, namely that it constitutes a special subtype of denominal verbs.

In this section, we first study nominal Noun–Verb compounds in Japhug and their relationship with ILC. Then, we discuss the question whether ILC constitutes incorporation.

5.1. Noun–verb composition in Japhug

Aside from noun–noun composition as mentioned above, Japhug has a moderately productive process of nominal composition, in which a noun in the *status constructus* is combined with a verbal root to form a new noun (Table 13).

The resulting compound can be either an agent noun, a patient noun or an action noun from the point of view of its semantics, without any formal marking. This kind of ambiguity is not normally found in Japhug nominalized verbs (or rather participles), which have different derivational prefixes depending on the semantic role of the relativized argument (kw– for S/A, $kɤ$– for O/action, $sɤ$– for non-core argument, tu– for action, etc.).

For some examples such as "Plantago" or "bottle stopper", it is possible that the verbal root first underwent a process of nominalization with the prefix tu– / $tɤ$– before entering the compound: this prefix is regularly lost in composition. In most cases, there is no way to tell whether the derivation from a given noun and verb to the nominal compound $[NV]_n$ followed the direct path in (i) or the indirect path in (ii)[9]:

(22) (i) $N + V > [NV]_n$ composition
      (ii) tu–$^{(v>n)} + V > [tu$-$V^{(v>n)}]_n > [tu$-$V]_n$ nominalization
            $N + [tu$-$V]_n > [NV]_n$ composition

For instance, the transitive verb $ɕpʰɤt$ "to patch" has a derived noun $tɤ$-$ɕpʰɤt$ "patch"; The plant name $tʂɤ$-$ɕpʰɤt$ could be either a compound of $tʂu$ "road" and $ɕpʰɤt$ "to patch", or of $tʂu$ and $tɤ$-$ɕpʰɤt$: both "road patcher" and "road patch" would be fitting metaphors for this plant. The process of nominal compounding suppresses the nominalization prefix $tɤ$–, so that one never finds a form such as *$tʂɤ$-$tɤ$-$ɕpʰɤt$.

In some cases however, semantics can help to settle this issue. For instance, in $rcɤ$-mbe-$ŋga$ "person who wears old jackets" can be glossed as:

(23) [$tɯ$-rcu $ɯ$-mbe] $ɯ$-$kɯ$-$ŋga$
      NEU-jacket   3SG-old   3SG-NMLZ:S/A-wear
      Person who wears old jackets.

The first two syllables of the compound derive from the noun phrase $tɯ$-rcu $ɯ$-mbe, and the whole compound has an Object–Verb structure.

Besides, if the last syllable in this compound –$ŋga$ were derived from $tɯ$-$ŋga$ "clothes", the nominalized form of $ŋga$ "to wear", it should not have its attested meaning.

We can conclude in cases like this that the compound was directly derived from the verb root $ŋga$ "wear" (path (i) in the example 22).

In any case, regardless of their exact diachronic origin, these noun–verb compounds can undergo denominal derivation like other nouns and be included in a verb stem. However, the resulting denominal verb, since it contains both a nominal and a verbal root, also seems to fit the definition of incorporation presented in section 2.

The present section will show that all ILC verbs treated in section 3.3 constitute examples of precisely this construction.

Observe the following example, with the noun $qʰaru$ "a look back", built out of the noun $ɯ$-$qʰu$ "behind" and the intransitive verb ru "look":

---

[9] The conventions used in this article to describe the derivations are the following: capital N and V indicate nominal and verbal roots respectively, square brackets [] indicate word boundaries while lowercase *n* and *v* mark the part of speech (noun or verb) of a given word. Derivational affixes are written as *affix*$^{(v>n)}$, with the derivational function of the infix (here v>n deverbal affix) indicated in superscript. Thus the derivation from a noun to a verb by a denominal affix is represented as $N + $affix$^{n>v} > [N^{(n>v)}]_v > [N]_v$.

Table 13
Examples of nominal noun–verb compounds.

Element 1	Element 2	Compound noun
tɯ-rcu "leather jacket"	*ŋga* "wear" (vt)	*rcɤ-mbe-ŋga* "beggar (the one
	ɯ-mbe "old"	who wears old jackets"
tʂu "road"	*ɕpʰɤt* "patch" (vt)	*tʂɤ-ɕpʰɤt* "Plantago sp."
		(a plant, lit. "road-patcher")
pʰoŋ "bottle"	*sti* "fill, block" (vt)	*pʰoŋ-sti* "bottle stopper"
si "wood"	*tɕʰaʁ* "diminish" (vi)	*sɯ-tɕʰaʁ* "shrinking (of wood)"

(24) *ɯʑo   kɯ   tatpa   ta-ta   ma   qʰaru   ci   nɤ   ʑo   mɯ-pa-lɤt*
      he   ERG   faith   AOR:3> 3-put because look.back a.little even   EMPH   NEG-AOR:3> 3-throw

      tɕe   tɤ-ari   ɲɯ-ŋu
      COORD AOR:up-go[II] IPF-be
      He had faith, as he did not look back at all, and went up. (Slobdpon 106)

qʰaru occurs here with the light verb *lɤt* in a construction meaning "look back". An alternative construction to the light verb construction also exists, and appears in the same story a few sentences earlier:

(25) *maka   ci   nɤ   ʑo   ma-pɯ-tɯ-nɤ-qʰa-ru-nɯ   ra   ma*
      at.all   a.little even   EMPH   NEG-IMP-2-DERIVATION-back-look-PL N.PST:have.to because

      pjɯ-tɯ-ɤtɤr-nɯ tɕe
      IPF-2-fall-PL   COORD
      Don't look back at all, otherwise you will fall. (Slobdpon 100)

It is clear from the above examples that the ILC verb *nɤ-qʰa-ru* "look back" is a denominal verb.[10] Like other denominal verbs, it is interchangeable with a light verb construction, and both constructions share the same lexical directional prefix *pɯ–* "down" (the form *pa–* occurs in aorist 3>3 forms of transitive verbs only, so that the ILC verb, being intransitive, has the basic form *pɯ–*).

It can be shown that many of the ILC verbs in Japhug belong to the same type as *nɤqʰaru* "to look back". We can conclude that the observed similarity of the denominal prefixes and the derivational prefixes found in ILC verbs is not fortuitous: they are really the same morphemes, and ILC is a subtype of denominal derivation.

The development of ILC in Japhug can therefore be described as follows:

(26) (i)   Creation of a noun + verb nominal compound: $N + V > [NV]_n$
      (ii) Denominal derivation of this compound: $\text{affix}^{(n>v)} + [NV]_n > [[NV]_n^{(n>v)}]_v$

Another possible path of derivation to interpret Japhug data would be:

(27) (i)   Denominal derivation: $\text{affix}^{(n>v)} + N > [N^{(n>v)}] > [N]_v$
      (ii) Composition of the denominal verb with a normal verb $[N]_v + V > [NV]_v$

However, solution (27) would leave $[NV]_v$ nominal compounds such as *qʰaru* "look back" above unexplained, and is contradicted by the fact that $[VV]_v$ compounds are relatively rare in Japhug. This grammatical pathway may however have existed in other language families, though no examples are known to the author. Similar phenomena in other languages will be discussed in section 6.

Table 14 shows the correspondences between Japhug ILC verbs and nominal forms.

The compound action noun from which ILC verbs are derived can always occur in a light verb construction (such as *qʰaru* above). We thus observe three competing constructions, as in the following examples:

---

[10] Note that the adverb *ci* "one, a little" is not a stranded element: in the first sentence *qʰaru* "a look back" and *ci* do not form a constituent. *ci* "one, a little" is indeed an indefinite nominal marker in some cases, but its use as a phrasal modifier is well attested, see for instance example 19 of the present article.

Table 14
ILC verbs and compound nouns.

Compound noun	Meaning	ILC verb	Meaning
X		*a-kɤ-**mtɕoʁ***	having a pointed head
cʰɤtsʰi	alcohol drinking	*ɣɯ-**cʰɤ**-tsʰi*	drink alcohol
cupʰut	clearing the stones	*ɣɯ-**cɯ**-pʰut*	take out stones (out of the field)
ɣlɯtɕɤt	taking out the dung	*ɣɯ-**ɣlɯ**-tɕɤt*	take out dung (out of the stable
ɣndzɤɣβta	fire (devastating)	*ɣɯ-**ɣndzɤɣβ**-ta*	clear (fields) with fire
kʰɯtsʰoʁ	hunting (with dogs)	*ɣɯ-**kʰɯ**-tsʰoʁ*	turn the dog loose on
pɕawtsɯfsoʁ	money earning	*ɣɯ-**pɕawtsɯ**-fsoʁ*	earn money
rɟɯfsoʁ	earning of riches	*ɣɯ-**rɟɯ**-fsoʁ*	earn riches
supʰut	tree felling	*ɣɯ-**sɯ**-pʰut*	cut wood (to make firewood)
tʂʰɤtsʰi	tea drinking	*ɣɯ-**tʂʰɤ**-tsʰi*	have tea
tsɤmtsʰi	leading	*ɣɯ-**tsɤ**-mtsʰi*	lead the way
X		*nɤ-**jlɤβ**-sqa*	cook with steam (vt)
kɤtɕʰu	headbutt	*nɤ-**kɤ**-tɕʰu*	hit with the head (vt)
zgrɯtɕʰu	nudge (n)	*nɯ-**zgrɯ**-tɕʰu*	nudge (vt)
X		*nɤ-**mpʰru**-ʑa*	do after after the other
tɤpʰuxtsɯ	clod-breaking (vt)	*nɤ-**pʰu**-xtsɯ*	break clods of earth
X		*nɤ-**qa**-ʑa*	start from the beginning (vt)
qʰaru	look back (n)	*nɤ-**qʰa**-ru*	look back
X		*nɤ-**qʰɤ**-ŋga*	to wear on the back
X		*nɤ-**ʑɯ**-loʁ*	have nausea
jlɤlɤɣ	yak herding	*nɯ-**jlɤ**-lɤɣ*	herd hybrid yaks
jlɤmtsʰi	yak leading	*nɯ-**jlɤ**-mtsʰi*	lead hybrid yaks
X		*nɯ-**mbrɤ**-pɯ*	ride (vl)
mbrɤrɟɯɣ	horse race	*nɯ-**mbrɤ**-rɟɯɣ*	gallop
X		*nɯ-**nŋɤ**-tʂo*	pay back one's debt
rɟɯrŋom		*nɯ-**rɟɯ**-rŋom*	envy people's wealth
X		*nɯ-**ɲɤm**-kʰe*	skinny
X		*nɯ-**ɲɤm**-sɯ*	plump
paʁlɤɣ	pig herding	*nɯ-**paʁ**-lɤɣ*	herd pigs
pʰaʁɲɤl	laying on the side	*nɯ-**pʰaʁ**-ɲɤl*	lay on the side
?		*nɯ-**qʰɤ**-stu-stu*	back up
rmɤkro	household splitting	*nɯ-**rmɤ**-kro*	split the household
rmɤmbe	moulting	*nɯ-**rmɤ**-mbe*	moult
snɯɲaʁ	harm (n)	*nɯ-**snɯ**-ɲaʁ*	harm
zrɯɣru	louse-picking	*nɯ-**zrɯɣ**-ru*	look for lice
tsɤrqɤsti	road-blocking	*nɯ-**tsɤ**-qɤ-sti*	block the way
X		*sɤ-**mbrɯ**-ŋgɯ*	be detestable
X		*sɤ-**ʑɯ**-loʁ*	be disgusting

(28) (i)   *cɯ-pʰut   nɯ-βzu-t-a*
          stone-clearing   AOR-do-PST-1SG
          I cleared stones (from the field).

      (ii)   *nɯ-ɣɯ-cɯ-pʰut-a*
            AOR-DERIVATION-stone-take.out-1SG
            I cleared stones (from the field).

      (iii) *cɯ   nɯ-pʰut-a*
            stone   AOR-take.out-1SG
            I cleared the stones (from the field). (elicitation, Chen Zhen)

Semantically, the three constructions are not entirely equivalent: light verb constructions (i) are used to insist on an action taking a long time, or occurring many times, and could be glossed in English as ''I devoted myself to clearing the stones.'' The incorporating and the analytic constructions are almost identical according to native speakers, though only (iii) can be used if the object is referential. In the pairs of examples 16 / 17 and 24 / 25 above, we saw that the ILC verb appeared first in the text, followed by the analytic construction or the light verb construction a few sentences away: these examples suggest that ILC is favoured in the first mention of an event, though more such examples from spontaneous texts are needed. Unfortunately however, the rarity of these examples in natural texts makes it difficult to study the pragmatic differences between the three constructions.

These can be elicited for all verbs in Table 14 which have a corresponding compound noun.

Aside from occurring in light verb constructions with *βzu* ''do'' or *lɤt* ''throw'', the noun–verb nominal compounds also appear in sentences such as the following:

(29)   *ɣndʑɤβta*   *pɯ-tu*
        fire   PST.IPF-be.there
        There was a fire. (elicitation, Chen Zhen)

(30)   *kʰɯtsʰoʁ*   *rga*
        hunting.with.dogs   N.PST:like
        He likes hunting with dogs. (elicitation, Chen Zhen)

As Table 14 shows, in some cases no corresponding independent noun exists. There examples include:

- All ILC verbs derived from noun-stative verb collocations (such as the example ''to have nausea'').
- Some ILC transitive verbs (such as *nɤ-qʰɤ-ŋga* ''to wear on one's back'').
- The stative *a-kɤ-mtɕoʁ* ''having a pointed head'', which is the only example of ILC whose derivational prefix is *not* denominal.

It seems reasonable to hypothesize that all examples from Table 14 originated from noun–verb compounds, even if these compounds are not present in the variety of Japhug studied here. A similar study in other Rgyalrong languages or even other dialects of Japhug might yield different results, and could be instructive to determine the relative antiquity of ILC verbs.

5.2. Is there incorporation in Japhug?

The ILC is somehow a paradox: this construction seems to fulfil the definition of incorporation presented in section 2, and yet it is also clearly almost always a special category of denominal verbs.

It constitutes a phenomenon quite distinct from prototypical incorporation, as exemplified by Nahuatl (Launey, 1980:165–166):

(31)   *ni-c-chīhua*   *cac-tli*
        1SG.S/A-3O-make   shoe-ABSOLUTE

(32)   *ni-cac-chīhua*
        1SG.S/A-shoe-make
        I make shoes.

In Nahuatl, incorporating verbs such *ni-cac-chīhua* differ from the Japhug ILC verbs in that no additional derivational affix appears alongside the nominal and the verbal roots.[11] Nahuatl has denominal verbs that are formed by the addition of the suffix *–ti* to the nominal stem, for instance *pochtēca–* ''seller'' > *pochtēca-ti* ''to do business'', and one cannot convert a nominal root into a verb without addition of that suffix: it is therefore impossible to argue that verbs such as *ni-cac-chīhua* derive from a noun **cac-chīhua* that was verbalized by zero-derivation. In Nahuatl, incorporation is a one-step process, by which the noun is integrated into the verbal enlarged stem to form a single word. In our notation, Nahuatl-type incorporation can be represented as simply: $N + V > [NV]_v$.

In Japhug, on the contrary, ILC is a three-step process:

1. Verb nominalization.
2. Compounding of the nominalized verb with a nominal root to form a nominal noun–verb compound (semantically an ACTION NOUN in all cases); nominalization markers are lost.
3. Derivation of that nominal compound into a verb using a denominal prefix. Noun–verb compounding is therefore embedded *within* the denominal derivation, unlike in Nahuatl where it is a one-stage process.

---

[11] Note however that in some language families with constructions generally analysed as incorporation, such as Algonquian, we find a derivational affix in most incorporating verbs, see section 2 of the present article. On the origin of the incorporational construction in Algonquian, see Garrett (2004).

Table 15
Subtypes of ILC verbs.

Type	Example	Incorporation	NV compound
1	ɣɯ-cɯ-pʰut "to take out stones (out of the field)"	N	Y
2	a-kɤ-mtɕoʁ "having a pointed head"	Y	Y
3	nɯ-nŋɤ-tʂo "to pay one's debt"	N	N
4	ɣɯ-ɣndʑɤβ-ta "to clear (fields) with fire"	N	Y
5	kɤtɯ-pa "to speak"	Y	Y

The ILC $[[NV]_n^{(n > v)}]_v$ could only be reinterpreted as $[NV]_v$ (incorporational construction) in the case of zero-derivation, or if the derivational prefixes disappeared due to phonetic changes; however, neither is the case in Japhug.

Therefore, from the point of view of morphological structure, most ILC verbs cannot be analysed as incorporating verbs. Nevertheless, from a functional point of view, it is clear that ILC presents at least three major properties common to incorporating constructions. First, ILC verbs are verbal noun–verb compounds that fulfil the definition given in section 2. Second, the nominal element of ILC is always non-referential. Third, we observe the same constraint on ILC nominal elements as on incorporated nouns: S, O and adjunct nominal elements can appear in ILC, but not A.

ILC and related forms in Japhug can be divided into five distinct categories depending on the nature of the nominal element. We now examine whether each of these categories (a) constitutes prototypical incorporation and (b) constitutes a noun–verb verbal compound.

The first category includes most ILC verbs. In this type, the nominal element is a plain underived noun, such as *cɯ* "stone" in *ɣɯ-cɯ-pʰut* "to take out stones (out of the field)". These verbs, as mentioned above, cannot be analysed as incorporation.

The second category is exemplified by only one verb, *a-kɤ-mtɕoʁ* "having a pointed head". Unlike other ILC verbs, it lacks a denominal prefix, as the element *a–* is part of the original verb *amtɕoʁ* "pointed". Although this last verb derives historically from the stative verb *mtɕoʁ* "sharp" by addition of *a–*, the prefix *a–* here is not a derivational element (it is unrelated to the homophonous passive *a–* prefix) and it is not analysable synchronically. In *a-kɤ-mtɕoʁ*, the noun is synchronically incorporated *within* the verbal stem. This example, unlike verbs of the first category, constitutes unambiguous incorporation.

The third category contains two verbs *nɯ-nŋɤ-tʂo* "to pay one's debt" and *nɯ-rmɤ-kro* "to split the household". In these two examples, the nominal elements originate from deverbal nouns, respectively *tɯ-nŋa* "debt" and *tɯ-rma* "household", which themselves come from the verbs *nŋa* "to owe" and *rma* "to stay at a place". The *status constructus* stems –*nŋɤ*– and –*rmɤ*– are formally ambiguous: they could originate either from the verb or from the derived nouns (since the deverbal prefix *tɯ*– is lost during the *status constructus* formation). Only the meaning allows us to determine that these elements originate from nouns and not from verbs.[12]

Like verbs of the first category, these two verbs cannot be considered as instances of prototypical incorporation, but they do not constitute real noun–verb compounds either, due to the formal ambiguity of the nominal elements.

The fourth category includes the verb *ɣɯ-ɣndʑɤβ-ta* "to clear (fields) with fire". In this ILC verb, the nominal element *ɣndʑɤβ* "fire" is a deverbal noun as in third category ILC verbs. However, it differs from these verbs in that *ɣndʑɤβ* "fire" is a fossilized formation deriving from *ndʑɤβ* "to burn" by the irregular prefix *ɣ–*. Since *ɣndʑɤβ* "fire" is not a synchronically transparent deverbal noun from *ndʑɤβ* "to burn", and since a trace of the derivation is preserved within the compound, there is no ambiguity as to the nominal status of this element.

The fifth category is the aberrant verb *kɤtɯpa* "to speak" mentioned in section 3. This verb resembles *ɣɯ-ɣndʑɤβ-ta* "to clear (fields) with fire" in that it includes a deverbal noun preserving its derivation prefix. The element *kɤtɯ-* is the *status constructus* of *kɤ-ti* "things that are said, niggling" which derives from *ti* "to say" by addition of the regular *kɤ–* participle prefix. This verb, unlike other ILC verbs, lacks any derivation prefix, and cannot be analysed as denominal derivation neither synchronically nor even diachronically. Therefore, just as *a-kɤ-mtɕoʁ* "having a pointed head", it can be analysed as incorporation.

Table 15 summarizes the previous discussion.

In conclusion, there are really only two incorporating verbs in Japhug: *kɤtɯpa* "to speak" and *akɤmtɕoʁ* "having a pointed head", but most ILC verbs (except those of category 3) constitute noun–verb verbal compounds, and are functionally similar to incorporating verbs.

---

[12] Note that verb–verb compounds also exist in Japhug: from *joʁ* "to raise" and *βzɯr* "to move" one derives the noun *joʁβzɯr* "putting in order, tidying up" hence the verb *rɯjoʁβzɯr* "to tidy up".

6. Typological perspectives

In the previous section, we have shown that most Japhug ILC verbs do not constitute prototypical incorporation, but rather a denominal construction whose syntactic functions resemble incorporation.

In this section, we will present other types of ILC in various languages, and show that ILC can develop into incorporation.

6.1. Incorporation-like construction in other languages

Incorporation-like constructions are not restricted to Japhug Rgyalrong. Similar constructions can be found in Ancient Greek and in familiar Germanic languages such as German and English.

In Ancient Greek, we find a few denominal verbs which can be analysed as a type of ILC (see Benveniste, 1966):

(33)   (i)   οἰκο-δόμ-ος
             house-build-NOM.SG.MASC
             "house builder, architect"
       (ii) οἰκο-δομ-έ-ω
             house-build-DENOMINAL-1SG
             "to build a house, erect a building"

Compound nouns of type (i) include a noun (here οἶκος "house") and the nominalized form of a verbal root δομ-ός with accent retraction in composition (here from the -o- grade of the root *demh$_2$, the corresponding verb form δέμω "to build" having -e- grade).

Denominal verbs of type (ii) are derived from (i) by addition of a denominal suffix -έ-; this is the productive way of forming denominal verbs in Greek (cf πόλεμ-ος "war" > πολεμ-έ-ω "to be at war").

The Greek construction differs from Japhug ILC in three ways. First, the nominal compounds in (i) are always agent nouns, never abstract nouns as in Japhug. Second, the verb >noun derivation by ablaut (δέμω "to build" > -δομ-ός) was not fully productive by the fifth century BC (when οἰκοδόμος "house builder" and οἰκοδομέω "build a house" are first attested), unlike derivation by *tɯ–* in Japhug. Third, the second element of the compounds with -o- vocalism is always formally different from the stem of the corresponding verb (with -e- vocalism), unlike Japhug where they are almost always identical (except for *sŋom* "to envy" > *nɯrʝurŋom* "to envy people's wealth"). Thus, while the derivation formula for Japhug ILC is $[[NV]_n^{(n>v)}]_v$, that of Greek οἰκοδομέω "build a house" is rather $[[N[V^{v>n}]_n]_n^{(n>v)}]_v$.

In German, we find the interesting case of the verb *staub-saug-en* "to hoover".[13] This verb is formed of two elements related to the noun *Staub* "dust" and the verb *saug-en* "to suck". Since it can be conjugated in all finite forms, and since both of its constituting elements can appear independently, and since it constitutes a unique morphological and phonological word, it would appear to be an example of incorporation according to our definition. This verb is ambitransitive, and can occur with a patient in some cases:

(34)   *ich*   *staub-saug-e*
       I   dust-suck-1SG.PRESENT
       I do the hoovering.

(35)   *ich*   *staub-saug-e*   *den*   *Boden*
       I   dust-suck-1SG.PRESENT   ART.M.SG.ACC   floor
       I am hoovering the floor.

Note that a competing form with the nominal element occurring separately also exists:

(36)   *ich*   *saug-e*   *Staub*
       I   suck-1SG.PRESENT   dust
       I do the hoovering.

---

[13] I owe this example and the related discussion to Johanna Mattissen.

Staub in (36) is clearly not an object, as it cannot receive an article, and in any case this second construction does not constitute incorporation. This kind of discontinuous structure is not surprising in German, where many prefixal elements can appear separated from the verb stem in finite forms (eg. *Ich mache die Tür auf* "I open the door" from the verb *aufmachen* "to open").

However, the verb *staubsaugen* "to hoover", as pointed out by Mattissen, must have been built from the noun *Staubsauger* "vacuum cleaner" by back-formation, since the activity could not have existed before the invention of this machine. In other words, compounding occurs within another derivation in this case as in Japhug.

The German verb *staubsaugen* differs however in three ways from the Japhug ILC verbs. First, as mentioned above, it is built by backformation, not by denominal derivation. Second, the base noun is an instrument, not a action noun. Third, there is no derivational element comparable to the Japhug denominal prefixes *ɣɯ–*, *nɯ–*, etc. in this German verb.

This shows that the phenomena observed in Japhug are but a particular case of all theoretically possible forms of incorporation-like constructions. Also, in the case of German ILC is formally indistinguishable from genuine incorporation; only knowledge of the derivational history of the word allows us to determine that it does not constitutes a direct N + V verbal compound.

In English, we find ambiguous verbal compounds that can be interpreted as incorporation, due to the pervasive presence of zero-derivation (both from noun to verb and from verb to noun). For instance, in non-standard varieties of English, one finds sentences such as the following (taken from the Internet)[14]:

(37)   I duck hunted Lake Ophelia for years.

The verb "to duck-hunt" exemplified by this example apparently constitutes non-saturating nominal incorporation. It must have originated from the compound noun *duck-hunt* by zero-derivation, and thus would seem to be a verbalized Noun–Noun compound. However, since the verb and the noun *hunt* in English are homophonous, there is synchronically no evidence that the root *hunt* in the verb *to duck-hunt* is nominal rather than verbal. Here again in English we observe a third kind of incorporation-like construction, that came into being due to the pervasive noun - verb homophonous pairs. As in the case of the German backformation and unlike Japhug, the absence of formal derivational markers allows the English construction to be reanalysed as incorporation in spite of being historically a denominal construction.

The development path described above is by no means restricted to English. Creissels and Sambou (manuscript:279) have proposed an interpretation of incorporation constructions in the Mandinka language along the same lines: "Verbal compounds [i.e. incorporating verbs], rather than being directly formed after corresponding syntactic constructions, originate from nominal compounds later converted to verbs".[15] It is likely that such a development is rather common in languages such as English and Mandinka, in which it is possible to convert nouns into verbs without overt morphological marking.

Incorporation-like constructions include three types of attested derivations exemplified by Japhug/Greek, German and English/Mandinka, respectively:

(38)   (i) $[NV]_n + \text{affix}^{(n > v)} > [[NV]_n^{(n > v)}]_v \ (> [NV]_v)$
               Denominal derivation of a noun–verb nominal compound (Japhug, Greek). Notice that the last stage
               of the derivation, namely the reanalysis of the ILC as incorporation, is blocked due to the presence of
               overt denominal marking in these languages. Greek differs from Japhug in that the compound noun from
               which the ILC is derived already contains an unambiguous verb > noun derivation: $[[N[V^{v > n}]_n]_n^{(n > v)}]_v$;
               reanalysis as genuine incorporation is even more difficult.

        (ii) $[[NV]_v^{(v > n)}]_n - \text{affix}^{(v > n)} > [NV]_v$
               Backformation from a nominal compound including a nominal and a verbal root (German).

        (iii) $[NN]_n > [NN]_v > [NV]_v$
               reanalysis as $[NV]_v$ due to homophony between noun and verb (English).

These phenomena are not commonly analysed as incorporation, due to the fact that the order of derivation is distinct from "classical" incorporating languages such as Nahuatl. However, speakers are not usually conscious of the derivational history of the constructions they use, and ambiguous forms can be reanalysed; the synchronic head-complement structure of a compound does not necessarily reflect the historical one.

---

[14] Scores of similar examples, involving –*hunt* or –*pick* as a second element, but also verbs such as *horse-race*, can be found in colloquial Internet texts.

[15] [les] composés verbaux, plutôt que d'être formés directement à partir des constructions syntaxiques correspondantes, proviennent de composés nominaux ultérieurement convertis en verbes".

Table 16
Denominal derivation in Lavrung.

Base noun	Meaning	Verb	Meaning
daɣ[55]	poison	*n-daɣ*[55]	to be poisoned
lvaɣ[55]	shoulder	*n-lvaɣ*[55]	to bear on the shoulder
svə[53]	pus	*n-svə*[53]	to suppurate
phraɣ[55]	sieve	*s-phraɣ*[55]	to sieve
ʁrdʑɣə[55]	sprout	*ʁ<v>rdʑɣə*[55]	to sprout
xtsəm[53]	mortar	*xtsəm*[53]	to husk with mortar and pestle
zgle[55]	bolt	*(nɛ-)zgle*[55]	to bolt (the door)
χtɕo[53]	leprosy	*(ka-)χtɕo*[55]	to get leprosy

6.2. Lavrung

Lavrung, a language closely related to Japhug (both belong to the Rgyalrongic subbranch of Sino-Tibetan, see Sun, 2000), presents a similar system of denominal derivation, and there are a few examples of ILC in the published data on this language.

6.2.1. Denominal derivation in Lavrung

Denominal derivation in Lavrung, as in Japhug, is based on a series of prefixes, but unlike Japhug, it also allows zero-derivation (Huang, 2007:145–146) (Table 16)[16]:

The Lavrung prefixes n-, s- and f-/v- clearly corresponds to Japhug *nɯ–* / *nɤ–*[17], *sɯ–* / *sɤ–*[18] and *ɣɯ–* / *ɣɤ–* respectively.[19]

The absence of derivational prefixes in the last three examples can be interpreted in three ways.

1. The derivation took place from verb to noun, not from noun to verb.
2. There used to be denominal zero-derivation in proto-Rgyalrongic, the common ancestor of Lavrung and Japhug, and this derivation was only preserved in Lavrung.
3. The Lavrung verbs lost their denominal prefix in these examples.

The first hypothesis can be ruled out: the only forms of nominalization reported in Huang (2007) involve the addition of suffixes; there are no examples of affixless nominalization in this language. The second hypothesis is unlikely, given the complete absence of denominal zero-derivation in Japhug. If this process had been productive, we would expect at least some traces of it in Japhug. We will now examine the third hypothesis in more detail.

Japhug CV prefixes generally correspond to simple consonant prefixes in Lavrung. Since these prefixes present a vowel contrast (*ɯ* or *ɤ*) in Japhug while this contrast is lost in Lavrung, it is clear that Lavrung is innovative and underwent syncope.[20]

The massive syncope affecting Lavrung prefixes resulted in a proliferation of exceedingly complex consonant clusters. The prefixes have lost productivity (unlike Japhug, they cannot be applied to recent Chinese loanwords) and often undergo metathesis with the initial clusters (as in *ʁ<v>rdʑɣə*[55] "to sprout" in Table 16).

However, some restrictions on the prefixes exist. In particular, concerning the pair *xtsəm*[53] "mortar" and *xtsəm*[53] "to husk", neither the clusters **fxts–*, *xfts–*, **ŋxts–* nor **xnts–* exist in Lavrung, so that the derivational prefixes *n–* and *v–*, even if originally present in the verb *xtsəm*[53] "to husk" disappeared for purely phonetic reasons.[21]

Prefix attrition is a general feature of Lavrung: in this language, many prefixes still productive in Japhug only exist as traces. For instance, there is no prefix corresponding to the Japhug nominalization prefix *kɯ–* in Lavrung, but traces are found in fossilized forms such as *ɣdʑav* "fire", cognate of Japhug *ɣndʑɤɣβ* "fire" (see the preceding section for the

---

[16] The syllables between brackets are the aorist prefixes.
[17] We find in Japhug denominal verbs that are partially parallel to the Lavrung ones: *tɤ-ndɤɣ* "poison" > *z-nɤ-ndɤɣ* "to poison s.o." and *tɯ-rpaʁ* "shoulder" > *nɤ-rpaʁ* "to bear on the shoulder".
[18] Example semantically parallel to Japhug *ɕɯɣra* "sieve" > *sɯ-ɕɯɣra* "sieve".
[19] Possibly cognate to Japhug *tɤ-tɕɯɣ* "tree sprout" > *ɣɤ-tɕɯɣ* "to sprout"; Japhug *ɣɤ–* is the regular outcome of proto-Japhug *wɒ–*.
[20] If instead one assumed that Japhug is innovative and underwent general vowel anaptyxis in prefixes, the origin of the vowel contrast would not be explainable.
[21] Similar phenomena have been documented in the related language Horpa by Sun (2007).

etymology of this noun). Many Japhug prefixes, such as the second person *tɯ–* or the irrealis *a–* have no equivalent in Lavrung, but can be conjectured to have been lost in this language.[22]

6.2.2. ILC in Lavrung

The presence of incorporation or an incorporation-like construction in Lavrung has never been specifically mentioned, but in Huang (2007) we find two clear examples of such constructions.

First, *mbra³³rʝjuɣ⁵³* ''to race (on horseback)'' (Huang, 2007:312), a compound of the native noun *bre³³* ''horse'' with the verb *rʝjuɣ⁵³* ''to run'' (from Tibetan *rɡʲug* ''to run''). The noun in *status constructus* (with *–e > –a* vowel alternation) appears between the verb root and denominal prefix *m–* (allomorph of *n–*). The aorist form of this verb is:

(39)   *nɛ³³-m-bra³³-rʝjuɣ⁵⁵*
      AOR-DERIVATION-horse-run

The presence of the aorist prefix before the noun dispels any doubt that this compound is one morphological word and not a noun–verb collocation.

This example is identical in structure to Japhug *nɯ-mbrɣ-rʝuɣ* ''to gallop'' mentioned above, and one finds a one-to-one correspondence in structure:

m–	*bra³³–*	*rʝjuɣ⁵³*
nɯ–	*mbrɣ–*	*rʝuɣ*
derivation	horse (status constructus)	run

Although this example is no proof that the compound ''race on horseback'' can be reconstructed to proto-Rgyalrongic (both verbs could have been constructed independently from the same elements), it proves that the ILC existed in the proto-language.

Second, *rʝja³³sŋam⁵³* ''to envy people's wealth'' is another example relevant to our discussion (quoted from Huang, 2007:321). This verb originates from *rʝja³³* ''property, goods, wealth'' (a borrowing from Tibetan *rɡʲu* ''fortune'') and the verb *rŋəm⁵⁵* ''to be greedy for, to lust for''. The aorist form of this verb is:

(40)   *nɛ⁵⁵-rʝjə⁵⁵-sŋam⁵⁵*
      AOR-wealth-be.greedy

Here again, the noun appears between the aorist prefix and the verb root, and the compound constitutes a single morphological word. This verb clearly has the same structure as Japhug *nɯ-rʝɯ-rŋom* ''to envy people's wealth'', except that unlike *mbra³³rʝjuɣ⁵³* ''to race (on horseback)'' it lacks any derivational prefix, and we can analyse it as an incorporational construction. However, given the rarity of incorporation in Japhug, and the fact that derivational prefixes (the only distinguishing feature of incorporation and ILC) tend to disappear in Lavrung, it is unlikely that this verb arose as a result of direct noun–verb compounding in Lavrung. A more likely hypothesis is that this incorporating verb is an ancient ILC verb whose prefix disappeared for phonotactic reasons; neither groups of type **nrC–* nor of the type **rnC–* (where C stands for any consonant) are attested in Lavrung. It is therefore legitimate to suppose a form **n-rʝə-sŋam* in pre-Lavrung similar to Japhug *nɯ-rʝɯ-rŋom*, which simplified to the attested *rʝja⁵⁵-sŋam⁵⁵* due to the phonological constraint on having consonant clusters containing both /n/ and /r/ before another consonant.

The loss of any overt marking of denominal derivation in *rʝjə⁵⁵-sŋam⁵⁵*, combined with the absence of any action noun compound such as Japhug *rʝɯrŋom* ''envying people's wealth'' as such compounds do not exist in Lavrung, makes it possible to analyze this verb as incorporation synchronically. Thus, it exemplifies a grammaticalisation pathway similar to that observed in English and German:

(41)   INCORPORATION-LIKE CONSTRUCTION > INCORPORATION

A more exhaustive study of incorporating verbs in Lavrung will not be possible without complementary fieldwork on this language, but this section has shown that both ILC and incorporation are attested in spite of the limited published corpus,[23] and that incorporation is likely to originate from ILC in this language.

---

[22] The second person prefix *tɯ–* in Japhug is unlikely to be a recent innovation, as argued in Jacques (2012a).

[23] Lai Yunfan, a student working on the Wobzi dialect of Lavrung (on which see Lai, 2012) found another ILC verb: *ʁ< N > pæ̂-fɕæ̂* ''to chatter'' (aorist *næ̂-ʁ<N >pæ̂-fɕî*), compound of *fɕæ̂* (aorist *nɯ-fɕî*) ''to tell'' and *χpí* ''story'' with the denominal marker *N–* (allomorph of *n–*) appearing infixed in the nominal element. He also reports the absence of a corresponding noun–verb action noun compound **χpæ-fɕi*. Further fieldwork will certainly reveal other such verbs.

7. Conclusion

The data presented in the previous sections from Japhug and other languages illustrate a new path of development:

(42)   NOUN-VERB ACTION NOUN COMPOUND + DENOMINAL DERIVATION
          > INCORPORATION-LIKE CONSTRUCTION
          > INCORPORATION

The Japhug ILC is an intermediate stage on this development path; it can become incorporation only when the denominal derivation marker either (1) is absent due to zero-derivation (as in English and Mandinka), (2) disappears due to phonological attrition (as in Lavrung), (3) becomes restricted to noun–verb compounds and ceases to be a denominal marker synchronically.

The noun–verb compounds themselves can have the following origin:

(43)   NOUN + NOMINALIZED VERB > NOUN-VERB NOMINAL COMPOUND

Alternatively, they may, as in the case of English, be intrinsically ambiguous noun–noun compounds forms that can be reinterpreted as noun–verb compounds due to noun–verb homophony.

The only previously known origin of incorporation, noun coalescence, can explain most of the incorporating structures observed in the world's languages. Even in languages such as Iroquoian, where incorporated nouns appear between the inflectional prefixes and the root (Mithun, 2000), one could argue that incorporated nouns were originally free nouns, cliticized to the verb, that progressively coalesced with it. In the first stage of development, they would always appear as the outermost morpheme of the verbal word (as in Limbu), but progressively get closer to the verbal root by way of externalisation of inflection (Haspelmath, 1993).

This article however shows that incorporation does not necessarily originate from noun–verb coalescence, but could be a special development of denominal derivation in at least some languages.

In order to avoid the cumbersome expression ''Incorporation-like construction'', we suggest the use of the term ''indirect incorporation'' in future studies to refer to the phenomena observed in Japhug, English and German studied in this article.

Genuine incorporation, such as what is observed in Nahuatl or in the Japhug verb *akɤmtɕoʁ* ''having a pointed head'', can be called ''direct incorporation'' to avoid confusion.

References

Aikhenvald, A., 2007. Typological distinctions in word-formation. In: Language Typology and Syntactic Description, Volume III: Grammatical Categories and the Lexicon. Cambridge University Press, Cambridge, pp. 1–64.

Baker, M., 2009. Is head movement still needed for noun incorporation? Lingua 119.2, 148–165.

Benveniste, E., 1966. Convergences typologiques. L'Homme 6.2, 5–12.

Bickel, B., Nichols, J., 2007. Inflectional morphology. In: Shopen, T. (Ed.), Language Typology and Syntactic Description. Cambridge University Press, Cambridge, pp. 169–240.

Creissels, D., Sambou, P., manuscript. Le mandingue du kaabu, ou mandinka (mandinkakáŋo).

DeLancey, S., 1981. The category of direction in Tibeto-Burman. Linguistics of the Tibeto-Burman Area 6.1, 83–101.

Fortescue, M., Jacobson, S., Kaplan, L., 2010. Comparative Eskimo Dictionary, with Aleut Cognates. Alaska Native Language Center, Fairbanks.

Garrett, A., 2004. The evolution of algic verbal stem structure: new evidence from yurok. In: Ettlinger, M., Nicholas, F., Park-Doob, M. (Eds.), Proceedings of the Thirtieth Annual Meeting of the Berkeley Linguistics Society, February 13–16, 2004: Special Session on the Morphology of Native American Languages. Berkeley Linguistics Society, Berkeley, pp. 46–60.

Gerdts, D.B., 1998. Incorporation. In: Spencer, A., Zwicky, A. (Eds.), The Handbook of Morphology. Blackwell, Oxford.

Gerdts, D.B., 2003. The morphosyntax of halkomelem lexical suffixes. International Journal of American Linguistics 69.4, 345–356.

Gerdts, D.B., Hukari, T.E., 2008. Halkomelem denominal verb constructions. International Journal of American Linguistics 74.4, 489–510.

Goddard, I., 1990. Primary and secondary stem derivation in algonquian. International Journal of American Linguistics 56.4, 449–483.

Gong, X. Personal agreement system of zbu rgyalrong (ngyaltsu variety). Transactions of the Philological Society, in press.

Haspelmath, M., 1993. The diachronic externalization of inflection. Linguistics 31.2, 279–309.

Haugen, J.D., 2008. Morphology at the Interfaces. Reduplication and Noun Incorporation in Uto-Aztecan. Benjamins, Amsterdam.

Hildebrandt, K.A., 2007. Prosodic and grammatical domains in limbu. Himalayan Linguistics 8, 1–34.

Huang, B., 2007. Lawurongyu yanjiu 拉塢戎語研究 (Study on the Lavrung Language). Minzu chubanshe, Beijing.

Jacques, G., 2004. Phonologie et morphologie du japhug (Rgyalrong). Ph.D. Thesis. Université Paris VII-Denis Diderot.

Jacques, G., 2008. Jiarongyu yanjiu 嘉絨語研究 (Study on the Rgyalrong language). Minzu chubanshe, Beijing.

Jacques, G., 2010. The inverse in Japhug Rgyalrong. Language and Linguistics 11.1, 127–157.

Jacques, G., 2011. The structure of the tangut verb. Journal of Chinese Linguistics 39.2, 419–441.

Jacques, G., 2012a. Agreement morphology: the case of rgyalrongic and kiranti. Language and Linguistics 13.1, 83–116.

Jacques, G., 2012b. Argument demotion in japhug rgyalrong. In: Haude, K., Authier, G. (Eds.), Ergativity, Valency and Voice. Mouton De Gruyter, Berlin, pp. 199–226.

Lai, Y., 2012. Wobzi lavrung phonology.

Launey, M., 1980. Introduction à la langue et à la littérature aztèque, tome 1: grammaire. L'Harmattan, Paris.

Matisoff, J.A., 1973. The Grammar of Lahu. University of California Press, Berkeley.

Matisoff, J.A., 2003. Handbook of Proto-Tibeto-Burman, vol. 135. University of California Press, Berkeley/Los Angeles.

Mattissen, J., 2003. Dependent-head synthesis in Nivkh: a contribution to a typology of polysynthesis. Benjamins, Amsterdam.

Mattissen, J., 2006. The ontology and diachrony of polysynthesis. In: Wunderlich, D. (Ed.), Advances in the Theory of the Lexicon. Mouton de Gruyter, Berlin/New York, pp. 287–354.

Mithun, M., 1984. The evolution of noun incorporation. Language 60.4, 847–894.

Mithun, M., 1986. On the nature of noun incorporation. Language 62, 32–38.

Mithun, M., 2000. The reordering of morphemes. In: Gildea, S. (Ed.), Reconstructing Grammar, Comparative Linguistics and Gramamticalization. Benjamins, Amsterdam, pp. 231–258.

Mithun, M., 2009. Polysynthesis in the arctic. In: Mahieu, M.-A., Tersis, N. (Eds.), Variations on Polysynthesis, The Eskaleut Languages. Benjamins, Amsterdam, pp. 3–18.

Nichols, J.D., Nyholm, E., 1995. A Concise Dictionary of Minnesota Ojibwe. University of Minnesota Press, Minneapolis.

Post, M., 2009. The phonology and grammar of galo words: a case study in benign disunity. Studies in Language 33.4, 934–974.

Sadock, J.M., 1980. Noun incorporation in greenlandic: a case of syntactic word-formation. Language 57, 300–319.

Sadock, J.M., 1986. Some notes on noun incorporation. Language 62, 19–31.

Sapir, E., 1911. The problem of noun incorporation in American languages. American Anthropologist 13, 250–282.

Schackow, D., 2008. Clause linkage in Puma (Kiranti). Master's Thesis. Universität Leipzig.

Schiering, R., Bickel, B., Hildebrandt, K.A., 2010. The prosodic word is not universal (but emergent). Journal of Linguistics 46, 657–709.

Sun, J.T.-S., 2000. Parallelisms in the verb morphology of sidaba rgyalrong and lavrung in rgyalrongic. Language and Linguistics 1.1, 161–190.

Sun, J.T.-S., 2003. Caodeng rgyalrong. In: Thurgood, G., LaPolla, R. (Eds.), The Sino-Tibetan Languages. Routledge, London, pp. 490–502.

Sun, J.T.-S., 2005. Jiarongyuzu yuyan de yin'gao: liangge ge'an yanjiu 嘉戎語組語言的音高: 兩個個案研究 (on pitch in the rgyalrongic languages: Two case studies). Yuyan yanjiu 語言研究, 25.1, 50–59.

Sun, J.T.-S., 2006. Jiarongyu dongci de paisheng xingtai 嘉戎語動詞的派生形態 (derivational morphology in the rgyalrong verb). Minzu yuwen 民族語文, 4.3, 3–14.

Sun, J.T.-S., 2007. Morphological causative formation in shangzhai horpa. Bulletin of Chinese Linguistics 1.2, 207–227.

Sun, J.T.-S., Shidanluo, 2002. Caodeng jiarongyu yu rentong dengdi xiangguan de yufa xianxiang 草登嘉戎語與「認同等第」相關的語法現 (empathy hierarchy in caodeng rgyalrong grammar). Language and Linguistics, 3.1, 79–99.