The interaction of person and number in Japhug: Towards a theory of cyclic fission

This study offers an analysis of the φ-agreement pattern in Japhug, a Sino-Tibetan language not investigated by generativists. I put forth a new approach to *fission*, showing that it not only captures the complex agreement pattern, but also has interesting implications for how syntax and morphology interact in general.

Data The relevant data are presented in (1–4), all from Jacques's 2025 extensive grammar. Consider (1–3) first, which show the agreement pattern of intransitive verbs:

(1)	a.	*ɕe-a*	b.	*ɕe-j*	(2)	a.	*tu-ɕe*	b.	*tu-ɕe-nu*	(3) a.	*ɕe-∅*	b.	*ɕe-∅-nu*
		go-1		go-1pl			2-go		2-go-pl		go-3		go-3-pl
		'I go'		'we go'			'you$_{SG}$ go'		'you$_{PL}$ go'		'she goes'		'they go'

As above, a Japhug intransitive verb uses different strategies to mark the person (π) and number (#) features of the subject. Particularly, while (1b) shows that 1pl is marked on the verb by the dedicated 1pl suffix *-j*, (2b) and (3b) show that *-nu* is a less-specified suffix that only marks #, since it is shared by 2pl and 3pl. Also, the second- and the third-person features are marked as *tu-* and -∅, respectively, regardless of # (-∅ posited for ease of exposition; nothing hinges on it for current purposes). The VI rules in (5) can be stated.

Now consider transitives (4). In general, the same exponents in (5) are used to mark the object, if the object is first or second person (cf. (4a) with (1b), and (4b) with (2b)). What is important here is that in both (4a) and (4b), the *number* of the third-person subject is not marked on the verb (*-nu* in (4b) may only mark the number of the second-person object):

(4)

	features (subj > obj)	form & gloss	translation
a.	{ 3sg, 3pl } > 1pl	*ɣu-mto-j* INV-see-1pl	'she/they sees/see us'
b.	{ 3sg, 3pl } > 2pl	*tu-wɣ-mto-nu* 2-INV-see-pl	'she/they sees/see you$_{PL}$'
c.	3sg > 1sg	*ɣu-mto-a* INV-see-1	'she sees me'
d.	3pl > 1sg	*ɣu-mto-a-**nu*** INV-see-1-**pl**	'**they** see me'

(5) a. [1] → *-a*
b. [1pl] → *-j*
c. [2] → *tu-*
d. [3] → -∅
e. [pl] → *-nu*

Essentially, it is not the case that the number of the subject is never marked on the verb. It *can* be marked, if the object is singular. As (4c&d) demonstrate, while *-a* marks the singular first-person object in both cases, an extra #-suffix *-nu* (5e) may occur after it, if the third-person subject is plural (4d). That is, in contrast to (4a&b), the number feature of the third-person subject is marked in (4c&d) (a second-person subject behaves similarly; the full paradigm will be discussed in the talk). In (4d), two φ-suffixes are used, one for π and one for # (assuming that *-a* marks only π (5a)), their features coming from **two different arguments**.

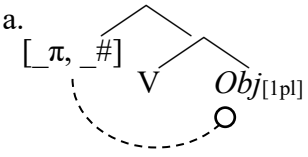
Issue Concentrating on the φ-suffixes, it is clear that π and # are realized *sometimes* by a single exponent (1b&4a), *sometimes* separately (3b&4d). Essentially, how [1] and [pl] are realized depends on where these features are from: If they are from *the same argument*, then *-j* (5b); if *two arguments*, then *-a-nu* (5a&e). The question is how to capture this pattern. Logically, two possibilities exist. First, π and # may start out as two separate probes and undergo *fusion* under certain contexts (Coon & Bale 2014). Second, there may be a bundled probe [_π, _#], which sometimes gets split, i.e., *fissioned*, being realized as two exponents.

I argue that the fission approach is correct. For the former fusion approach to hold, there must be a way for the PF interface to somehow distinguish the sources of the two features—it is unclear how this would be formulated in the grammar. By contrast, as I show below, the fission approach can capture the pattern straightforwardly, under the assumption that fission happens *cyclically*.

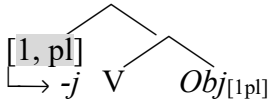
Analysis I first derive (4a), where fission does not occur. I posit a complex [_π, _#] probe right above VP which is responsible for the φ-suffixes (I assume that the φ-prefixes realize a higher head and will put them aside; more will be discussed in the talk). As in (6), the low probe [_π, _#] Agrees with the object, and both [1] and [pl] are copied onto it (6b). The structure is then sent to spell-out, where the probing head is realized as *-j* (5b):

Note that the features of the subject play no role in (4a/6): [_π, _#] simply does not Agree with it, whose probing happens before the subject is merged. The picture, however, is more complex in (4b), where [1] and [pl] are realized separately. As in (7a), [_π, _#] again first Agrees with the object, but now, only π is valued (7b), because the object lacks # (I assume singular = the lack of #). I assume here that spell-out is triggered simply by every instance of Merge (cf. Müller 2010, a.o.; more comments will be provided). Hence, the structure in (7b) is sent to PF, where *-a* is inserted for [1], according to (5a).

(6) a.

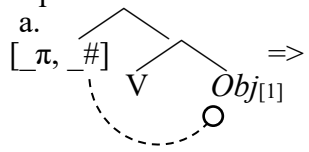


b.



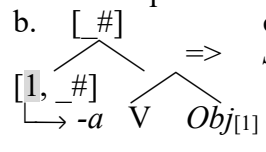
In addition, I follow Bobaljik 2000 in assuming that VI rules are *rewrite* rules that 'consume' formal features; that is, features undergoing vocabulary insertion no longer stay in the representation. Now, crucially, the [_#] part of the probe is not realized, i.e., it is not consumed, so it must stay in the derivation (see also Bondarenko & Zompì 2025). The derivation continues. In (7c), the unvalued [_#] reprojects and probes again (unvalued features are by definition probes; Bošković 2011, a.o.), in the next cycle of syntax. It is at this point that the subject is merged, and [_#] may now Agree with it, from which the [pl] feature is copied (7d). Note that the current process can in fact be viewed as a typical case of Cyclic Agree (Béjar & Rezac 2009). The structure is then (re)sent to PF, where [pl] is realized as *-nɯ* (5e), as expected (the linearization of the two suffixes is a separate issue to be addressed in the presentation) (7d):

(7) a.



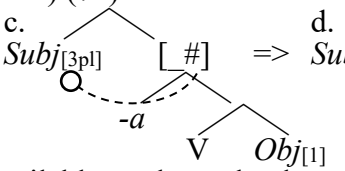
=>

b. [_#]



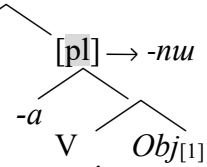
=>

c.



=>

d.



In sum, in (7b), a valued # feature is simply not available on the verb when the structure is sent to spell-out for the first time (# is valued only later). The analysis thus captures the fission effect in (4d), where π and # are realized separately even though there is a dedicated VI rule to realize them as a whole (5b). There is no need to enrich the VI rules in a way that they could distinguish the sources of the input features.

Discussion The cyclic fission account of the Japhug data suggests that the cycles of Agree intervene with cyclic spell-out, and can actually be viewed as an extension of Béjar & Rezac's 2009 Cyclic Agree. Additionally, the account follows Bondarenko & Zompì 2025 in having unrealized features remaining in the derivation. However, while they discuss valued features in particular (which may not be realized because of accidental gaps in the vocabulary), the present study argues that the picture is more general: Unvalued features may also stay, as they (rather trivially) are also not realized at PF. Further, unvalued features may probe again in the next cycle and eventually get realized, because they are (by definition) still probes.

Note that the current analysis does not rely on fission as a separate morphological mechanism. We get the fission effect merely via syntactic devices and late insertion. While this in fact conforms with the 'standard' view that fission is merely driven by vocabulary insertion, i.e., if insertion does not discharge all the features in one step, the remaining features may trigger insertion again (Noyer 1992, Halle 2000), what is novel is the argument that the two steps of insertion happen in two spell-out domains. That is, instead of fission happening in a single cycle (8), the realization of $[F_1]$ and $[F_2]$ (i.e., the insertion of α and β in (8)) may actually happen in two spell-out domains as in (9), where $[F_2]$ may stay unvalued when X is first sent to spell-out (step ②); as $[F_2]$ is unvalued at this point, it is not realized at PF; thus it stays in the derivation (Halle 1990, Trommer 1999, Bobaljik 2000). The valuation of $[F_2]$ happens essentially in the next cycle, in syntax (step ③), only after which $[F_2]$ is (re-)transferred, where it is rewritten by another VI rule:

(8) ① syntax: $[_X\ F_1, F_2]$ => ② PF: $[F_1] \rightarrow \alpha$, $[F_2] \rightarrow \beta$ (one cycle)

(9) ① syntax: $[_X\ F_1, F_2]$ => ② PF: $\mathbf{[F_1] \rightarrow \alpha}$, $([F_2])$ => ③ syntax: (α), $\mathbf{[_X\ F_2]}$ => ④ PF: α, $\mathbf{[F_2] \rightarrow \beta}$

cycle 1 cycle 2

Sel. Refs. Béjar & Rezac 2009 *LI* // Bobaljik 2000 Ins and outs // Bondarenko & Zompì 2025 *NLLT* // Halle 2000 Impoverishment and fission // Jacques 2025 *A grammar of Japhug* // Müller 2010 *LI* // Noyer 1992 Thesis