Paradigm shape is morphomic in Nepali

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Introduction

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- Morphology by itself (Aronoff 1994):

(1) a. morphomic stems ⇔ Latin third stem
b. morphomic classes ⇔ Romance inflectional classes
c. morphomic templates ⇔ Hebrew binyanim

- Nepali presents an other type of morphomic object :

(1) d. morphomic features ⇔ Nepali paradigm shape

- We provide an analysis in PFM (Stump, 2001)

1 Nepali conjugation: background information

Synthetic conjugation

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- There are 8 synthetic TAM combinations illustrated below with BIRSANU 'to forget' :

PRESENT	birsãtʃʰa	FUTURE	birselā	NARRATIVE PRESENT	birsãdatʃʰa
PAST IMPERFECTIVE	birsãtʰjo	INJUNCTIVE	birsos	NARRATIVE PAST IMPERFECTIVE	birsãdatʰjo
SIMPLE PAST	birsjo	IMPERATIVE	birsa		

- Polarity is expressed synthetically. The positive forms exemplified above have corresponding negative forms:

PRESENT	birsãdajna	FUTURE	birsojna	NARRATIVE PRESENT	birsãdajna
PAST IMPERFECTIVE	birsãdajnatʰjo	INJUNCTIVE	nabirsos	NARRATIVE PAST IMPERFECTIVE	birsãdajnatʰjo
SIMPLE PAST	birsena	IMPERATIVE	nabirsa		

Inflectional classes

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- Nepali conjugation has four regular inflectional classes[1]:

	PRESENT	PERFECTIVE	FUTURE	INFINITIVE	
1	suttʃʰa	sutjo	sutlā	sutnu	'sleep'
2	birsãtʃʰa	birsjo	birselā	birsanu	'forget'
3	ubʰĩtʃʰa	ubʰijo	ubʰielā	ubʰinu	'stand'
4	gāũtʃʰa	gājo	gāulā	gāunu	'sing'

- The end of the perfective stem determines the class:

1	sut-jo	sut	VC
2	birs-jo	birs	CC
3	ubʰi-jo	ubʰi	i
4	gā-jo	gā	ā

- The preceding inflectional classes can be reduced to phonological conditions on realization rules (Boyé, 1999). In the following, BIRSANU 'forget' of class 2 will serve as a general example for all classes.

A sample sub-paradigm

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- In a given sub-paradigm, verbs are inflected for gender (M, F), number (SG, PL), person (1, 2, 3) and honorific grade (LOW, MID, HIGH). But:
  - honorification occurs only with persons 2 and 3;
  - high grade honorific neutralizes number and collapses person 2 and 3;
  - plural neutralizes gender.

	M.SG	F.SG	PL
1	birsẽ	birsẽ	birsjaũ
2.LOW	birsis	birsis	birsjau
2.MID	birsjau	birsjau	birsjau
3.LOW	birsjo	birsi	birse
3.MID	birse	birsin	birse
HIGH	birsanubʰajo		

Negative simple past of *birsanu* 'forget'

Concurrent forms

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- Some TAM combinations have concurrent sub-paradigms.
  - negative present has 2 realizations: "I don't forget": birsãdinã, birsanna
  - negative past imperfective has 3 realizations: "I didn't forget": birsãdinatʰẽ, birsannatʰẽ, birsãtʰinã̃
  - negative future has 2 realizations: "I won't forget": birsojna, nabirsũlā
- In the following, we will follow the descriptive tradition and use unique names for every sub-paradigm :
  - negative present: long form birsãdinã vs short form birsanna;
  - negative past imperfective: long form birsãdinatʰẽ vs short form birsannatʰẽ vs 'thi' form birsãtʰinã̃;
  - negative future: suffixal birsojna vs prefixal nabirsũlā.

[1] Nepali has very few irregular verbs displaying only stem allomorphies. For the purpose of this study of syncretism, they do not diverge from the regulars.

2 The issue: systematic syncretism

Syncretism

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- The extent of syncretism varies from one sub-paradigm to another. The maximal syncretism is represented by short present negative with only 6 distinct forms for the 16 cells:

	M.SG	F.SG	PL
1	birsanna	birsanna	birsannaũ
2.LOW	birsannas	birsannas	birsannau
2.MID	birsannau	birsannau	birsannau
3.LOW	birsanna	birsanna	birsannan
3.MID	birsannan	birsannan	birsannan
HIGH	birsanuhunna		

Short negative present of *birsanu* 'forget'

Systematic syncretism

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- Some forms are systematically identical in all the sub-paradigms for all lexemes (irregulars included). The long negative present only exhibits these systematic syncretisms:

	M.SG	F.SG	PL
1	birsãdinã	birsãdinã	birsãdajnaũ
2.LOW	birsãdajnas	birsãdinas	birsãdajnau
2.MID	birsãdajnau	birsãdinau	birsãdajnau
3.LOW	birsãdajna	birsãdina	birsãdajnan
3.MID	birsãdajnan	birsãdinan	birsãdajnan
HIGH	birsanuhũdajna		

Long negative present of *birsanu* 'forget'

  - person 1: masculine is always identical to feminine
  - person 2 & 3: masculine mid, plural low and plural mid are always identical

A better view

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- The systematic syncretism might be better seen by changing the layout of the table[2]:
  - exchanging the M.SG and the F.SG columns

	F.SG	M.SG	PL
1	birsãdinã		birsãdajnaũ
2.LOW	birsãdinas	birsãdajnas	
2.MID	birsãdinau		birsãdajnau
3.LOW	birsãdina	birsãdajna	
3.MID	birsãdinan		birsãdajnan

[2] As the high grade honorific will play no role in the ensuing discussion, we remove it from the following tables.

- The preceding layout has a comb-like structure which can be collapsed, arranging the remaining 10 forms in a two column table and further modified to obtain rows and columns with uniform exponence:

-in-	-ajn-
birsãd-in-ã	birsãd-ajn-aũ
birsãd-in-as	birsãd-ajn-as
birsãd-in-au	birsãd-ajn-au
birsãd-in-a	birsãd-ajn-a
birsãd-in-an	birsãd-ajn-an

$\Longrightarrow$

-in-	-ajn-	
birsãd-in-ã		-ã
	birsãd-ajn-aũ	-aũ
birsãd-in-as	birsãd-ajn-as	-as
birsãd-in-au	birsãd-ajn-au	-au
birsãd-in-a	birsãd-ajn-a	-a
birsãd-in-an	birsãd-ajn-an	-an

		A	B
1	α	birsãdinã	
	β		birsãdajnaũ
2	α	birsãdinas	birsãdajnas
	β	birsãdinau	birsãdajnau
3	α	birsãdina	birsãdajna
	β	birsãdinan	birsãdajnan

3 A morphomic account

The idea: morphomic features

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- Even in realizational morphology, rules usually realize **morphosyntactic** features, i.e. features with some syntactic or semantic reflex.
- We propose to relax this requirement: some rules may realize auxiliary features that relate only indirectly to morphosyntactic properties.
  - Nepali paradigms are not structured by GENDER, NUMBER and HONORIFICATION but by morphomic features COLUMN and ROW.
- Using morphomic features changes absolutely nothing formally.
  - We illustrate this by providing a full PFM account of Nepali synthetic conjugation based on morphomic features.

Relating morphosyntactic and morphomic features

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(2) a. {NB *pl*} ⊃ {COL *b*}
  b. {GEN *fem*, NB *sg*} ⊃ {COL *a*}
  c. {GEN *mas*, NB *sg*} ⊃ ({PER *1*} ≡ {COL *a*})

(3) a. {NB *pl*} ⊃ {ROW β}
  b. {HON *mid*} ⊃ {ROW β}
  c. {HON *low*, NB *sg*} ⊃ {ROW α}
  d. {PER *1*, NB *sg*} ⊃ {ROW α}

		FEM.SG	MAS.SG	PL
1		{COL *a*, ROW α}		{COL *b*, ROW β}
2	LOW	{COL *a*, ROW α}	{COL *b*, ROW α}	
	MID	{COL *a*, ROW β}	{COL *b*, ROW β}	
3	LOW	{COL *a*, ROW α}	{COL *a*, ROW α}	
	MID	{COL *a*, ROW β}	{COL *b*, ROW β}	

The canonical case: the long negative present

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		COL *a*	COL *b*
PER 1	ROW α	birsãd-**i**-n-**ũ**	—
	ROW β	—	birsãd-**aj**-n-**aũ**
PER 2	ROW α	birsãd-**i**-na-**s**	birsãd-**aj**-na-**s**
	ROW β	birsãd-**i**-n-**au**	birsãd-**aj**-n-**au**
PER 3	ROW α	birsãd-**i**-na	birsãd-**aj**-na
	ROW β	birsãd-**i**-na-**n**	birsãd-**aj**-na-**n**

(4) **Block 4:**

a. X_V, σ : {POL *neg*, FORM *long*, COL *a*} ⟶ X⊕i

b. X_V, σ : {ASP *imperf*, FORM *long*, POL *neg*, COL *b*} ⟶ X⊕aj

(5) **Block 8:**

a. X_V, σ : {MODE *ind*, PER *1*, ROW α} ⟶ X⊕ã

b. X_V, σ : {PER *1*, ROW β, COL *b*} ⟶ X⊕aũ

c. X_V, σ : {MODE *ind*, PER *2*, ROW β} ⟶ X⊕au

(6) **Block 10:**

a. X_V, σ : {PER *2*, ROW α} ⟶ X⊕s

b. X_V, σ : {PER *3*, ROW β} ⟶ X⊕n

Further syncretism: the short negative present

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There is much more syncretism in other subparadigms, most of which is dealt with by feature underspecification.

		COL *a*	COL *b*
PER 1	ROW α	birsanna	—
	ROW β	—	birsann-**aũ**
PER 2	ROW α	birsanna-**s**	birsanna-**s**
	ROW β	birsann-**au**	birsann-**au**
PER 3	ROW α	birsanna	birsanna
	ROW β	birsanna-**n**	birsanna-**n**

(7) **Block 8:**

a. X_V, σ : {PER *1*, ROW β, COL *b*} ⟶ X⊕aũ

b. X_V, σ : {MODE *ind*, PER *2*, ROW β} ⟶ X⊕au

(8) **Block 10:**

a. X_V, σ : {PER *2*, ROW α} ⟶ X⊕s

b. X_V, σ : {PER *3*, ROW β} ⟶ X⊕n

NB: a portmanteau rule precludes the presence of a block 8 exponent for {PER *1*, COL *a*, ROW α}.

Covert syncretism: the future

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- In the future, the {COL *a*, ROW *α*} looks just like a {COL *b*} form, unexpectedly.
- We treat this as a case of covert syncretism, i.e., syncretism to a slot that is normally unused.

		COL *a*	COL *b*
PER 1	ROW *α*	birsũlā	—
	ROW *β*	—	birsaũlā
PER 2	ROW *α*	birselis	birselās
	ROW *β*	birsauli	birsaulā
PER 3	ROW *α*	birseli	birselā
	ROW *β*	birselin	birselān

(9) Block 9

a. X_V, σ : {POL *pos*, TENSE *fut*, COL *a*} ⟶ X⊕li

b. X_V, σ : {POL *pos*, TENSE *fut*, COL *b*} ⟶ X⊕lā

c. X_V, σ : {POL *pos*, TENSE *fut*, PER *1*, ROW *α*, COL *a*,} ⟶ ⟨X, *σ* / {COL *b*}⟩ : 9

4 Discussion

An possible alternative: dual paradigms

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- Stump (2002,2006) proposes a system of dual paradigms:
  - The **content paradigm** interfaces with syntax and semantics.
  - The **form paradigm** interfaces with realization rules.
  - Rules of **paradigm linkage** link the two.
  - The same features structure both paradigms.
  - Rules of paradigm linkage are organized according to Pāṇini's Principle.
- Since the dual paradigm system is intended as a model of morphosyntactic mismatches, it is tempting to try to apply it here.

A possible alternative: dual paradigms (2)

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- Allows for an account of syncretism:

content paradigm cell	⇝	**form paradigm cell**
{GEN *mas*, NB *sg*, PER *1*}	⇝	{GEN *fem*, NB *sg*, PER *1*}
{GEN *mas*, NB *pl*, HON *low*}	⇝	{GEN *mas*, NB *pl*, HON *mid*}
{GEN *mas*, NB *sg*, HON *mid*}	⇝	{GEN *mas*, NB *pl*, HON *mid*}

- **But** relevant generalizations can not be expressed:

(10) a. X_V, σ : {ASP *imperf*, FORM *long*, POL *neg*, **COL *b***} ⟶ X⊕aj

b. X_V, σ : {TENSE *past*, POL *neg*, ASP *perf*, **COL *b***} ⟶ X⊕e

(11) a. X_V, σ : {PER *3*, **ROW *β***} ⟶ X⊕n

A possible alternative: dual paradigms (3)

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- Rules of paradigm linkage can be reexpressed as portmanteau rules of referral:

(12) a. X_V, σ : {GEN *mas*, NB *sg*, PER *1*} ⟶ ⟨X, σ / {GEN *fem*}⟩ : 1-10
b. X_V, σ : {GEN *mas*, NB *pl*, HON *low*} ⟶ ⟨X, σ / {HON *mid*}⟩ : 1-10
c. X_V, σ : {GEN *mas*, NB *sg*, HON *mid*} ⟶ ⟨X, σ / {NB *pl*}⟩ : 1-10

- Thus the dual paradigm model does not help us; what is crucial is the use of morphomic features.
- In addition, conceptual issue: the dual paradigm model is fit for "Pāṇinian" situations; here we are dealing with a systematic mismatch.

Conclusions

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- We provide a full, formally conservative analysis of Nepali conjugation based on morphomic features.
- Here we focalized on subject marking, but the grammar can be simplified by introducing other morphomic features related to TAM.
- Morphomic features are also useful in many cases where inflection seems to be relational rather than functional (Bonami & Boyé, 2007).
- General issue: we should not prejudge the characterization of the features realized by morphology.

A The full PFM account

A.1 Features

Notes:

- Traditional grammar recognizes an opposition between *narrative* and *non-narrative* forms of positive imperfective (indicative present and past) subparadigms. The semantic import of the distinction is somewhat elusive. Corresponding negative forms are said to neutralize the narrative/ non-narrative opposition, but do also occur in pairs. Here we assume a uniform distinction between long and short forms, in both polarities, and sidestep the investigation of the semantic import of this distinction (or lack thereof).
- There is a certain affinity between future tense, injunctive and imperative forms. Note that the synthetic future is an irrealis future (the realis future is periphrastic), and that the injunctive has both uses similar to that of an imperative and uses similar to that of a subjunctive. Here we conservatively assume that the three subparadigms belong to three distinct modes (indicative, injunctive, imperative), but our account could probably be improved upon by a thourough study of the uses of these subparadigms.
- All person, gender and number distinctions are neutralized in the high honirification level. Moreover these forms are quasi-analytic, and rest on the conjugation of the auxiliary *hunu*. Since a treatment of (quasi-)periphrasis would take us too far afield, we include these forms in the conjugation tables but do not treat them in the fragment.

A.1.1 Feature inventory

attribute	possible values
MODE	*ind* (indicative), *inj* (injunctive), *imp* (imperative)
TENSE	*prst* (present), *past*, *fut* (future)
ASP (aspect)	*perf* (perfective), *imperf* (imperfective)
POL (polarity)	*pos* (positive), *neg* (negative)
FORM	*short*, *long*, *thi*
PER (person)	*1*, *2*, *3*
GEN (gender)	*mas* (masculine), *fem* (feminine)
NB (number)	*sg* (singular), *pl* (plural)
HON (honorification)	*low*, *mid*, *high*
COL (column)	*a*, *b*
ROW	α, β

A.1.2 Feature cooccurrence restrictions

FCRs are written in the format of Gazdar et al. (1985)

(13) Tense, aspect, mode

a. {TENSE} ⊃ {MODE *ind*}

b. {ASP} ⊃ {MODE *ind*}

c. {TENSE FUT} ⊃ ~ {ASP}

d. {TENSE *prst*} ⊃ {ASP *imperf*}

(14) Negative forms

a. {FORM *short*} ⊃ {MODE *ind*}

b. {FORM *thi*} ⊃ {TENSE *past*, ASP *imperf*, POL *neg*}

c. {TENSE *past*, ASP *perf*, POL *neg*} ⊃ {FORM *long*}

(15) Person

a. {MODE *imp*} ⊃ {PER *2*}

b. {PER *1*} ⊃ ~ {HON}

(16) Columns

a. {NB *pl*} ⊃ {COL *b*}

b. {GEN *fem*, NB *sg*} ⊃ {COL *a*}

c. {GEN *mas*, NB *sg*} ⊃ ({PER *1*} ≡ {COL *a*})

(17) Rows

a. {NB *pl*} ⊃ {ROW β}

b. {HON *mid*} ⊃ {ROW β}

c. {HON *low*, NB *sg*} ⊃ {ROW α}

d. {PER *1*, NB *sg*} ⊃ {ROW α}

A.1.3 Correspondance table

traditional name	feature set
present	{MODE *ind*, TENSE *psrt*, ASP *imperf*, POL *pos*, FORM *short*}
narrative present	{MODE *ind*, TENSE *psrt*, ASP *imperf*, POL *pos*, FORM *long*}
short negative present	{MODE *ind*, TENSE *psrt*, ASP *imperf*, POL *neg*, FORM *short*}
long negative present	{MODE *ind*, TENSE *psrt*, ASP *imperf*, POL *neg*, FORM *long*}
simple past	{MODE *ind*, TENSE *past*, ASP *perf*, POL *pos*}
negative simple past	{MODE *ind*, TENSE *past*, ASP *perf*, POL *neg*, FORM *long*}
past imperfective	{MODE *ind*, TENSE *past*, ASP *imperf*, POL *pos*, FORM *short*}
narrative past imperfective	{MODE *ind*, TENSE *past*, ASP *imperf*, POL *pos*, FORM *long*}
short negative past imperfective	{MODE *ind*, TENSE *past*, ASP *imperf*, POL *neg*, FORM *short*}
long negative past imperfective	{MODE *ind*, TENSE *past*, ASP *imperf*, POL *neg*, FORM *long*}
'thi' form negative past imperfective	{MODE *ind*, TENSE *past*, ASP *imperf*, POL *neg*, FORM *thi*}
future	{MODE *ind*, TENSE *fut*, POL *pos*}
suffixal negative future	{MODE *ind*, TENSE *fut*, POL *neg*, FORM *short*}
prefixal negative future	{MODE *ind*, TENSE *fut*, POL *neg*, FORM *long*}
injunctive	{MODE *inj*, POL *pos*}
negative injunctive	{MODE *imper*, POL *neg*}
imperative	{MODE *imper*, POL *pos*}
negative imperative	{MODE *imper*, POL *neg*}

A.2 Realization rules

Rules are written in the format of Ackerman and Stump (2004).

(18) Block 1

a. $X_{V2\cup V3}, \sigma : \{\text{TENSE } \textit{fut}\} \longrightarrow X \oplus e^{\triangleright}$

b. $X_{V4}, \sigma : \{\text{TENSE } \textit{fut}\} \longrightarrow X \oplus u^{\triangleright}$

c. $X_{V2}, \sigma : \{\text{ASP } \textit{imperf}\} \longrightarrow X \oplus a$

d. $X_{V4}, \sigma : \{\text{ASP } \textit{imperf}\} \longrightarrow X \oplus u$

(19) Block 2

a. $X_{V}, \sigma : \{\text{ASP } \textit{imperf}\} \longrightarrow X \oplus {}^{\triangleleft}n$

(20) Block 3

a. $X_{V}, \sigma : \{\text{ASP } \textit{imperf}, \text{FORM } \textit{long}\} \longrightarrow X \oplus d$

(21) Block 4

a. $X_{V}, \sigma : \{\text{POL } \textit{neg}, \text{FORM } \textit{long}, \text{COL } \textit{a}\} \longrightarrow X \oplus i$

b. $X_{V}, \sigma : \{\text{ASP } \textit{imperf}, \text{FORM } \textit{long}, \text{POL } \textit{neg}, \text{COL } \textit{b}\} \longrightarrow X \oplus aj$

c. $X_{V}, \sigma : \{\text{TENSE } \textit{past}, \text{POL } \textit{neg}, \text{ASP } \textit{perf}, \text{COL } \textit{b}\} \longrightarrow X \oplus e$

d. $X_{V}, \sigma : \{\text{TENSE } \textit{past}, \text{POL } \textit{neg}, \text{ASP } \textit{perf}, \text{PER } \textit{2}, \text{ROW } \alpha, \text{COL } \textit{b}\} \longrightarrow X \oplus i$

e. $X_{V}, \sigma : \{\text{ASP } \textit{imperf}, \text{FORM } \textit{long}, \text{POL } \textit{pos}\} \longrightarrow X \oplus a$

f. $X_{V}, \sigma : \{\text{POL } \textit{neg}, \text{FORM } \textit{short}, \text{TENSE } \textit{fut}\} \longrightarrow X \oplus oj$

(22) Block 5

a. $X_{V}, \sigma : \{\text{POL } \textit{neg}\} \longrightarrow X \oplus na^{\triangleright}$

b. $X_{V}, \sigma : \{\text{POL } \textit{neg}, \text{MODE } \textit{inj}\} \longrightarrow na \oplus X$

c. $X_{V}, \sigma : \{\text{POL } \textit{neg}, \text{MODE } \textit{imp}\} \longrightarrow na \oplus X$

(23) Block 6

a. X_V, σ : {POL *pos*, TENSE *pres*, MODE *ind*} ⟶ X⊕tʃʰa▷

b. X_V, σ : {TENSE *past*, ASP *imperf*} ⟶ X⊕tʰ

(24) Block 7

a. X_V, σ : {TENSE *past*, ASP *imperf*} ⟶ X⊕i

b. X_V, σ : {TENSE *pres*, POL *pos*, COL *a*, ROW *β*} ⟶ X⊕i

(25) Block 8

a. X_V, σ : {TENSE *pres*, POL *pos*, COL *a*, ROW *α*} ⟶ X⊕ɛ

b. X_V, σ : {TENSE *pres*, POL *pos*, PER *1*, COL *a*, ROW *α*} ⟶ X⊕u

c. X_V, σ : {MODE *ind*, PER *1*, ROW *α*} ⟶ X⊕ã

d. X_V, σ : {MODE *ind*, TENSE *fut*, PER *1*, ROW *α*} ⟶ X⊕ũ

e. X_V, σ : {MODE *inj*, PER *1*, ROW *α*} ⟶ X⊕ũ

f. X_V, σ : {PER *1*, ROW *β*, COL *b*} ⟶ X⊕aũ

g. X_V, σ : {MODE *ind*, PER *2*, ROW *β*} ⟶ X⊕au

h. X_V, σ : {MODE *inj*, PER *2*} ⟶ X⊕e

i. X_V, σ : {MODE *inj*, PER *3*} ⟶ X⊕o

(26) Block 9

a. X_V, σ : {POL *pos*, TENSE *fut*, COL *a*} ⟶ X⊕li

b. X_V, σ : {POL *pos*, TENSE *fut*, COL *b*} ⟶ X⊕lã

c. X_V, σ : {POL *pos*, TENSE *fut*, PER *1*, ROW *α*, COL *a*,} ⟶ ⟨X, *σ*/{COL *b*}⟩ : 9

(27) Block 10

a. X_V, σ : {PER *2*, ROW *α*} ⟶ X⊕s

b. X_V, σ : {PER *3*, ROW *β*} ⟶ X⊕n

c. X_V, σ : {MODE *inj*, PER *3*, ROW *α*} ⟶ X⊕s

Portmanteau Rules

(28) Block 4-7

X_V, σ : {TENSE *past*, ASP *imperf*, POL *neg*, FORM *thi*} ⟶ ⟨⟨X, *σ*⟩ : 6, *σ*/{ASP *perf*, FORM *long*}⟩ : 4-5

(29) Block 7-10

a. X_V, σ : {TENSE *past*, ASP *imperf*, PER *1*, ROW *α*} ⟶ X⊕ẽ

b. X_V, σ : {TENSE *past*, ASP *imperf*, PER *3*, ROW *α*, COL *b*} ⟶ X⊕jo

c. X_V, σ : {TENSE *past*, ASP *imperf*, PER *3*, ROW *β*, COL *b*} ⟶ X⊕e

d. X_V, σ : {TENSE *past*, ASP *perf*, POL *pos*} ⟶ ⟨X, *σ*/{ASP *imperf*}⟩ : 7-10

(30) Block 8-10

a. X_V, σ : {MODE *ind*, POL *neg*, FORM *short*, PER *1*, ROW *α*} ⟶ X

b. X_V, σ : {MODE *imp*, PER *2*, ROW *β*} ⟶ X⊕a

c. $X_{V3 \cup V4}, \sigma$: {MODE *imp*, PER *2*, ROW *β*} ⟶ X⊕u

d. X_{V2}, σ : {MODE *imp*, PER *2*, ROW *α*} ⟶ X⊕ii

(31) Block 1-10

X_V, σ : {POL *neg*, TENSE *fut*, FORM *long*} ⟶ na⊕⟨X, *σ*/{POL *pos*}⟩ : 1-10

A.3 Morphophonology

All rules and tables work on phonemic representations. We list here only the morphophonological rules necessary to go from the output of the paradigm function to the forms in the following tables.

(32) "X$^{\triangleright}$" notes a segment that is soluble to its right:
   a. $[\alpha\ \text{voc}, \beta\ \text{cons}]^{\triangleright} \rightarrow \emptyset / \_\_\_\_ [\alpha\ \text{voc}, \beta\ \text{cons}]$
   b. $X^{\triangleright} \rightarrow X$ elsewhere.

(33) "$^{\triangleleft}$X" notes a segment that is soluble to its left:
   a. $^{\triangleleft}[\alpha\ \text{voc}, \beta\ \text{cons}] \rightarrow \emptyset / [\alpha\ \text{voc}, \beta\ \text{cons}] \_\_\_\_$
   b. $^{\triangleleft}X \rightarrow X$ elsewhere.

(34) o → u/____[+nasal, +cons] (Pokharel, 1980)

(35) Vn → Ṽ/____[−cont]

B Conjugation tables

		COL *a*	COL *b*
PER 1	ROW *α*	birsãtʃʰu	—
	ROW *β*	—	birsãtʃʰaũ
PER 2	ROW *α*	birsãtʃʰɛs	birsãtʃʰas
	ROW *β*	birsãtʃʰjau	birsãtʃʰau
PER 3	ROW *α*	birsãtʃʰɛ	birsãtʃʰa
	ROW *β*	birsãtʃʰin	birsãtʃʰan
HON *high*		birsanuhũtʃʰa	

The present of *birsanu* 'forget'

		COL *a*	COL *b*
PER 1	ROW *α*	birsãdatʃʰu	—
	ROW *β*	—	birsãdatʃʰaũ
PER 2	ROW *α*	birsãdatʃʰɛs	birsãdatʃʰas
	ROW *β*	birsãdatʃʰjau	birsãdatʃʰau
PER 3	ROW *α*	birsãdatʃʰɛ	birsãdatʃʰa
	ROW *β*	birsãdatʃʰin	birsãdatʃʰan
HON *high*		birsanuhũdatʃʰa	

The narrative present of *birsanu* 'forget'

		COL *a*	COL *b*
PER 1	ROW *α*	birsanna	—
	ROW *β*	—	birsannaũ
PER 2	ROW *α*	birsannas	birsannas
	ROW *β*	birsannau	birsannau
PER 3	ROW *α*	birsanna	birsanna
	ROW *β*	birsannan	birsannan
HON *high*		birsanuhunna	

The short negative present of *birsanu* 'forget'

		COL *a*	COL *b*
PER 1	ROW *α*	birsãdinã	—
	ROW *β*	—	birsãdajnaũ
PER 2	ROW *α*	birsãdinas	birsãdajnas
	ROW *β*	birsãdinau	birsãdajnau
PER 3	ROW *α*	birsãdina	birsãdajna
	ROW *β*	birsãdinan	birsãdajnan
HON *high*		birsanuhũdajna	

The long negative present of *birsanu* 'forget'

		COL *a*	COL *b*
PER 1	ROW *α*	birsẽ	—
	ROW *β*	—	birsjaũ
PER 2	ROW *α*	birsis	birsis
	ROW *β*	birsjau	birsjau
PER 3	ROW *α*	birsi	birsjo
	ROW *β*	birsin	birse
HON *high*		birsanubhajo	

The simple past of *birsanu* 'forget'

		COL *a*	COL *b*
PER 1	ROW *α*	birsinã	—
	ROW *β*	—	birsenaũ
PER 2	ROW *α*	birsinas	birsinas
	ROW *β*	birsinau	birsenau
PER 3	ROW *α*	birsina	birsena
	ROW *β*	birsinan	birsenan
HON *high*		birsanubhaena	

The negative simple past of *birsanu* 'forget'

		COL *a*	COL *b*
PER 1	ROW *α*	birsãt^{h}ẽ	—
	ROW *β*	—	birsãt^{h}jaũ
PER 2	ROW *α*	birsãt^{h}is	birsãt^{h}is
	ROW *β*	birsãt^{h}jau	birsãt^{h}jau
PER 3	ROW *α*	birsãt^{h}i	birsãt^{h}jo
	ROW *β*	birsãt^{h}in	birsãt^{h}e
HON *high*		birsanuhũt^{h}jo	

The past imperfective of *birsanu* 'forget'

		COL *a*	COL *b*
PER 1	ROW *α*	birsãdat^{h}ẽ	—
	ROW *β*	—	birsãdat^{h}jaũ
PER 2	ROW *α*	birsãdat^{h}is	birsãdat^{h}is
	ROW *β*	birsãdat^{h}jau	birsãdat^{h}jau
PER 3	ROW *α*	birsãdat^{h}i	birsãdat^{h}jo
	ROW *β*	birsãdat^{h}in	birsãdat^{h}e
HON *high*		birsanuhũdat^{h}jo	

The narrative past imperfective of *birsanu* 'forget'

		COL *a*	COL *b*
PER 1	ROW *α*	birsannat^{h}ẽ	—
	ROW *β*	—	birsannat^{h}jaũ
PER 2	ROW *α*	birsannat^{h}is	birsannat^{h}is
	ROW *β*	birsannat^{h}jau	birsannat^{h}jau
PER 3	ROW *α*	birsannat^{h}i	birsannat^{h}jo
	ROW *β*	birsannat^{h}in	birsannat^{h}e
HON *high*		birsanuhunnat^{h}jo	

The short negative past imperfective of *birsanu* 'forget'

		COL *a*	COL *b*
PER 1	ROW *α*	birsãdinat^{h}ẽ	—
	ROW *β*	—	birsãdajnat^{h}jaũ
PER 2	ROW *α*	birsãdinat^{h}is	birsãdajnat^{h}is
	ROW *β*	birsãdinat^{h}jau	birsãdajnat^{h}jau
PER 3	ROW *α*	birsãdinat^{h}i	birsãdajnat^{h}jo
	ROW *β*	birsãdinat^{h}in	birsãdajnat^{h}e
HON *high*		birsanuhũdat^{h}jo	

The long negative past imperfective of *birsanu* 'forget'

		COL *a*	COL *b*
PER 1	ROW *α*	birsãt^{h}inã	—
	ROW *β*	—	birsãt^{h}enaũ
PER 2	ROW *α*	birsãt^{h}inas	birsãt^{h}inas
	ROW *β*	birsãt^{h}inau	birsãt^{h}enau
PER 3	ROW *α*	birsãt^{h}ina	birsãt^{h}ena
	ROW *β*	birsãt^{h}inan	birsãt^{h}enan
HON *high*		birsanuhũt^{h}ena	

The 'thi' form negative past imperfective of *birsanu* 'forget'

		COL *a*	COL *b*
PER 1	ROW *α*	birsũlā	—
	ROW *β*	—	birsaũlā
PER 2	ROW *α*	birselis	birselās
	ROW *β*	birsauli	birsaulā
PER 3	ROW *α*	birseli	birselā
	ROW *β*	birselin	birselān
HON *high*		birsanuholā	

The future of *birsanu* 'forget'

		COL *a*	COL *b*
PER 1	ROW *α*	birsojna	—
	ROW *β*	—	birsojnaũ
PER 2	ROW *α*	birsojnas	birsojnas
	ROW *β*	birsojnau	birsojnau
PER 3	ROW *α*	birsojna	birsojna
	ROW *β*	birsojnan	birsojnan
HON *high*		birsanuhojna	

The suffixal negative future of *birsanu* 'forget'

		COL *a*	COL *b*
PER 1	ROW *α*	nabirsũlā	—
	ROW *β*	—	nabirsaũlā
PER 2	ROW *α*	nabirselis	nabirselās
	ROW *β*	nabirsauli	nabirsaulā
PER 3	ROW *α*	nabirseli	nabirselā
	ROW *β*	nabirselin	nabirselān
HON *high*		nabirsanuholā	

The prefixal negative future of *birsanu* 'forget'

		COL *a*	COL *b*
PER 1	ROW α	birsũ	—
	ROW β	—	birsaũ
PER 2	ROW α	birses	birses
	ROW β	birse	birse
PER 3	ROW α	birsos	birsos
	ROW β	birsun	birsun
HON *high*		birsanuhos	

The injunctive of *birsanu* 'forget'

		COL *a*	COL *b*
PER 1	ROW α	nabirsũ	—
	ROW β	—	nabirsaũ
PER 2	ROW α	nabirses	nabirses
	ROW β	nabirse	nabirse
PER 3	ROW α	nabirsos	nabirsos
	ROW β	nabirsun	nabirsun
HON *high*		nabirsanuhos	

The negative injunctive of *birsanu* 'forget'

		COL *a*	COL *b*
PER 1	ROW α	—	—
	ROW β	—	—
PER 2	ROW α	birsii	birsii
	ROW β	birsa	birsa
PER 3	ROW α	—	—
	ROW β	—	—
HON *high*		birsanuhos	

The imperative of *birsanu* 'forget'

		COL *a*	COL *b*
PER 1	ROW α	—	—
	ROW β	—	—
PER 2	ROW α	nabirsii	nabirsii
	ROW β	nabirsa	nabirsa
PER 3	ROW α	—	—
	ROW β	—	—
HON *high*		nabirsanuhos	

The negative imperative of *birsanu* 'forget'

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