J. Linguistics **57** (2021), 321–363.
doi:10.1017/S0022226720000341

Stem alternations in Kiranti and their implications for the morphology–phonology interface[1]

BORJA HERCE
University of Zurich

(Received 28 August 2019; revised 8 September 2020)

Stem alternation is present in the verbal inflection of all documented Kiranti languages, where it ranges from the straightforward phonologically conditioned (e.g. Athpariya and Chintang) to the purely morphological and baroque (e.g. Khaling and Dumi). This paper surveys stem alternation patterns across the whole family. Its main finding is that, unlike the morphological stem alternations of West Kiranti, the phonologically-conditioned stem alternations of East Kiranti are characterized by a very striking distributional similarity (often identity) across languages, even in the presence of quite drastic affixal changes. This and other findings suggest that these stem alternation patterns should be regarded as a (morphomic) grammatical phenomenon of its own right, despite being derivable from the forms of suffixes. Furthermore, comparison with West Kiranti suggests that this coextensiveness with a coherent phonological environment actually enhances some typically morphomic traits such as diachronic resilience and productivity.

KEYWORDS: diachrony, Kiranti, morphomes, paradigm, phonological conditioning, stem alternation

1. INTRODUCTION

Kiranti languages are a group of about two dozen related languages spoken in the mountains of eastern Nepal (see Figure 1). Although it has not been proved unmistakably whether the family constitutes a valid genetic unit (Ebert 2003: 516), the languages share a number of typological traits and belong, unmistakably, to the Sino-Tibetan phylum.

The internal genetic relationships within the family (particularly the higher order ones) continue to be uncertain to some degree, but according to the most recent hypothesis (Bickel & Gaenszle 2015), the internal structure of the family may resemble the one in Figure 2.

[1] Thanks are due to three anonymous referees of the *Journal of Linguistics* and to *JL* editor Marc van Oostendorp for feedback that has helped to improve this paper. Earlier versions of it were presented at the Workshop on Non-canonicity in Inflection at the University of Surrey, and at the 13th Conference of the Association for Linguistic Typology at the University of Pavia. I thank the audiences of those events for various comments and suggestions, particularly Matthew Baerman, Balthasar Bickel, and Erich Round. The financial support of the Basque Government scholarship PRE_2015_1_0175 and of TECHNE are also gratefully acknowledged.

Abbreviations in this paper follow the Leipzig Glossing Rules.

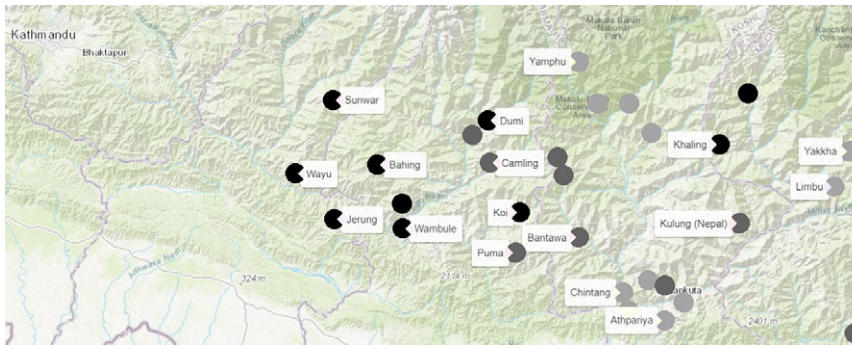

Figure 1
Location of the Kiranti languages (Glottolog 3.0, Hammarström, Forkel & Haspelmath 2017).

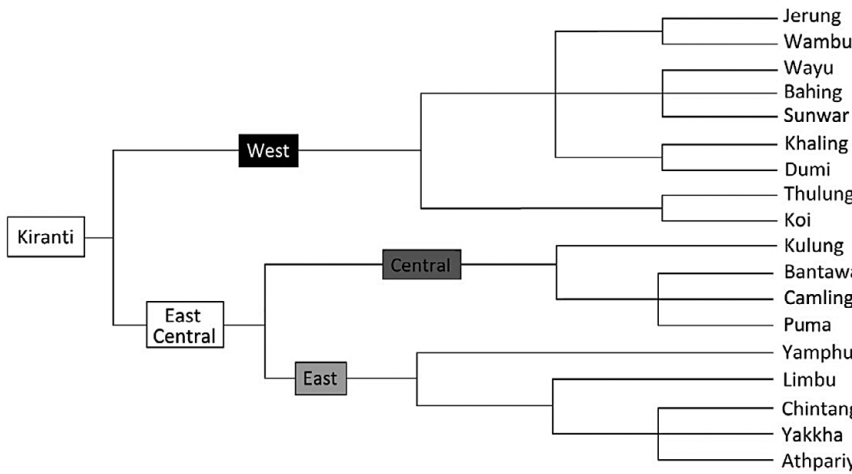

Figure 2
Kiranti family tree (based on Bickel & Gaenszle 2015).

Unlike most Sino-Tibetan languages,[2] Kiranti languages are characterized by their inflectional complexity, which reaches its greatest expression in the verbal domain. Kiranti verbs tend to agree in person (first, second, third) and number (singular, dual, plural) with agent and patient arguments. Clusivity distinctions are usually also present. Many inflectional endings are cumulative, or co-argument sensitive (Witzlack-Makarevich et al. 2016) in that they appear in specific combinations of agent and patient (e.g. 1DU>2SG, 2PL>1, etc.) or in that they encode

[2] It is possible, however, that complex morphology was characteristic of Proto-Sino-Tibetan and that this was later lost from most branches and only preserved in some peripheral families like Kiranti or Rgyalrongic (see Watters 2002: 371–417 and Jacques 2012).

https://doi.org/10.1017/S0022226720000341 Published online by Cambridge University Press

plurality or duality of agent and patient simultaneously. All of these characteristics make these languages particularly attractive to morphologists. It will be another morphological trait, however, that will constitute the focus of the present paper.

This other inflectional property, which is also widespread across Kiranti, is the presence of stem alternations in the verb. Ebert (2003) mentions that in the languages to the southeast of the Kiranti area, the paradigmatic distribution of stem alternation tends to be relatively straightforward: one of the alternants is found before vowel-initial suffixes and the other elsewhere. In languages to the northwest, however, the situation appears to be more complex, according to her, and phonological/phonotactic constraints can no longer account for the distribution of stem alternants within a paradigm.

A further point of interest to be mentioned in connection with stem alternation in Kiranti is that, in many cases, stem alternations seem to be cognate, i.e. they are often based upon the same forms and most likely descend from a common ancestral paradigmatic alternation of some sort in the Proto-language (Jacques et al. 2011: 1127–1128). Often, the alternations involve a /t/ (voiced sometimes to /d/), as is illustrated in (1) and/or an /s/ extension to the stem, as is illustrated in (2).

(1) (a) *hukt* ~ *huk* 'bark' (Athpariya) (Ebert 1997a: 20)

(b) *tupt* ~ *tup* 'light up' (Yakkha) (Schackow 2016: 213)

(c) *rukt* ~ *ruk* 'reach' (Yamphu) (Rutgers 1998: 103)

(d) *dʰant* ~ *dʰan* 'bring down' (Bantawa) (Doornenbal 2009: 129)

(e) *krakt* ~ *krak* 'force' (Khaling) (Jacques et al. 2011: 1102)

(2) (a) *poŋs* ~ *poŋ* 'be born' (Athpariya) (Ebert 1997a: 20)

(b) *luːs* ~ *luː* 'say' (Yamphu) (Rutgers 1998: 103)

(c) *ims* ~ *im* 'sleep' (Kulung) (Tolsma 1997: 106)

(d) *kʰans* ~ *kʰan* 'send' (Bantawa) (Doornenbal 2009: 129)

(e) *lwas* ~ *lwa* 'see' (Thulung) (Lahaussois 2002: 164)

In the simplest case, these /t/ or /s/ augments tend to be present before a vowel. In such a context, they can behave as the onset of the following syllable. Before a consonant or at the end of the word, these /t/ or /s/ augments tend to be absent. This behaviour is understandable considering that complex codas (also complex clusters

https://doi.org/10.1017/S0022226720000341 Published online by Cambridge University Press

in general) are usually disallowed in Kiranti. Because, **hukt-ma* 'bark-INF', for example, would contain an impossible cluster in Athpariya, a phonological readjustment of some sort is necessary in the syllable contact. The loss of the augment is the solution adopted by Athpariya (i.e. *huk-ma*) and other Kiranti languages.

The reason why it tends to be /t/ and /s/ that appear in this (unstable) morphotactic slot outside of the usual CVC structure of Kiranti stems demands, of course, some explanation. It is usually agreed that these forms go back ultimately to valency-changing suffixes that are widespread in Tibeto-Burman (Michailovsky 1985). Often, however, the suffixes appear to be lexicalized to some extent in most Kiranti languages (i.e. they are simply part of the root) and cannot be associated with any valency-increasing grammatical function synchronically. Although they sometimes vary quite substantially from one language to another, the stem alternations of Kiranti do not seem to encode any other grammatical value either and their paradigmatic distribution appears to be largely arbitrary. In the languages where these inherited stem alternations are not phonologically conditioned, therefore, they have to be regarded as 'morphomic' (i.e. purely morphological) in the sense of Aronoff (1994).

Most of the literature on morphomic stem alternations (e.g. Maiden 1992, 2018; O'Neill 2011) emphasizes their productivity and diachronic stability. However, most of it has been concerned exclusively with Romance languages, which is unfortunate. Kiranti stem alternations constitute a particularly interesting object of enquiry because of the size and diachronic depth of the family and because of their variety in terms of the forms involved, their paradigmatic distribution, complexity, and extramorphological predictability. More importantly, Kiranti stem alternations appear to contradict some of the main current assumptions of what morphomes can be (like). The most remarkable finding of this paper is that phonologically-conditioned stem alternations (which are not usually considered morphomic) can also be extraordinarily resilient, maybe more so, it will be argued, than exclusively morphological patterns. Developments in Kiranti suggest that their paradigmatic distribution is learnt redundantly (rather than derived from the phonological context alone) and is actively perpetuated, reinforced, and defended against potentially disruptive changes, just like in more traditional Romance morphomes. Kiranti stem alternations also question the necessity of segmentation for morphological analysis, and highlight the importance of morphological predictability at the syntagmatic level.

The rest of this paper is structured as follows: Sections 2–4 will describe stem alternation in 18 Kiranti languages (all for which a sufficient description exists of the phenomenon). Each of the sections will cover a different branch of Kiranti (East, Central, and West). On the evidence of this synchronic picture, Section 5 will engage in cross-linguistic comparison and will discuss some observed diachronic developments and their implications for morphological theory in general and for our understanding of the morphome in particular. Finally, Section 6 will summarize the paper and reiterate findings and claims.

https://doi.org/10.1017/S0022226720000341 Published online by Cambridge University Press

2. East Kiranti

2.1. Athpariya (data from Ebert 1997a)

Most verbs in Athpariya have two stems, as only stems ending in a vowel or a nasal may lack stem alternation. One of the stems occurs without exception before vowels and the other one elsewhere, i.e. before consonant-initial suffixes and word-finally. Maybe as expected, pre-vocalic stems are most usually characterized by greater segmental material than preconsonantal stems. The following formal alternations occur:

_V _C	_V _C
pt ∼ p	b ∼ p
tt ∼ t	d ∼ t
kt ∼ k	g ∼ k
Nd ∼ N	l ∼ n
Ns ∼ N	d/s/y ∼ Ø

The most frequent of these are alternations involving the augments (t, d, s), followed by voicings and consonant deletions. The n ∼ l alternation (also the absence of alternation) is comparatively infrequent. Even if the distribution of stem alternation in the paradigm is completely predictable from the shape of the corresponding suffix, the paradigmatic distribution of the stems will be presented next for comparative purposes. Note that the inflection of transitive and intransitive verbs differs in various respects. For reasons of space and ease of visualization, only forms with a 3SG patient will be presented for transitive verbs. Shading in the tables in this paper is used to highlight the paradigmatic distribution of stems, with different shades marking different stems.

As displayed in Table 1, the prevocalic stem appears, in the non-past tense of intransitive verbs, in the first and second person plural. Past and perfect tense forms all contain the prevocalic stem. In the case of the past, this is so because a vowel /a/ appears before the person suffixes which are consonant-initial (1SG/DU, 2DU and 3DU). In the case of the perfect, the prevocalic stem is due to a suffix *-es*(*a*) always following the stem.

	SG	DU	PL
1EXCL	khat-naʔa	khat-ciciŋa	khad-itiŋa
1INCL		khat-cici	khad-iti
2	a-khat-yuk	a-khat-cici	a-khad-iti
3	khat-yuk	khat-cici	u-khat-yuk

Table 1
Paradigm of Athpariya 'go' (*khat- khad-*) non-past, intransitive (Ebert 1997a: 163).

https://doi.org/10.1017/S0022226720000341 Published online by Cambridge University Press

	SG	DU	PL
1EXCL	lems-uŋtuŋ	lem-cucuŋa	lems-umtumma
1INCL		lem-cucu	lems-umtum
2	a-lems-utu	a-lem-cucu	a-lems-umtum
3	lems-utu	lem-cucu	o-lems-utu

Table 2
Paradigm of Athpariya 'beat' (*lems- lem-*) non-past, transitive, 3SG patient (Ebert 1997a: 180).

Because personal suffixes vary, the distribution of the stems is different in transitive verbs (Table 2). Here, the prevocalic stem appears in all singular and plural forms. The other two tenses (i.e. past and perfect) are characterized, as was the case in intransitive verbs too, by the prevocalic stem. In a way similar to intransitive verbs, this is because, in the past, a suffix /a/ appears before consonant-initial person suffixes (i.e. before the duals). In the perfect, this is due to a suffix *-ues*(*a*) always appearing after the stem.

2.2. Chintang (data from Paudyal 2013)

The situation in Chintang is very similar to that of Athpariya, understandably due to their close genetic relation. Most verbs have two stems, except those ending in a vowel, /m/, /p/, /ŋ/, /k/ and some ending in /g/ which do not alternate. One of the stems is used before a vowel and the other before a consonant or at the end of the word. The formal alternations involved appear to be slightly more complicated than in Athpariya, however

_V _C	_V _C
kt ∼ k	b ∼ p
tt/d ∼ iʔ	g ∼ k/ŋ
Nd ∼ N	n/l ∼ ĩ
d/s ∼ Ø	g/r ∼ Ø
ss ∼ ʔ	

The most frequent of these are, again, those involving the augments. I present the paradigmatic distribution of the stem alternants in intransitive verbs in Table 3. Here, the prevocalic stem appears in the 1PL and 2PL of non-past intransitive verbs. Although the suffixes are sometimes different (e.g. *-no* vs. *-yuk*), this is the exact same situation that was described for Athpariya. Also like in this language, the past tense has the prevocalic stem (i.e. *thab-*) everywhere since a suffix *-a* appears before

https://doi.org/10.1017/S0022226720000341 Published online by Cambridge University Press

	SG	DU	PL
1EXCL	thap-maʔã	thap-cekeŋa	thab-ikiŋa
1INCL		thap-ceke	thab-iki
2	a-thap-no	a-thap-ceke	a-thab-iki
3	thap-no	u-thap-ceke	u-thap-no

Table 3
Paradigm of Chintang 'come level' (*thap- thab-*) non-past, intransitive (Paudyal 2013: 86).

	SG	DU	PL
1EXCL	pid-ukuŋ	pi-cokoŋa	pid-ukumma
1INCL		pi-coko	pid-ukum
2	a-pid-oko	a-pi-coko	a-pid-ukum
3	pid-oko	u-pi-coko	u-pid-oko

Table 4
Paradigm of Chintang 'give' (*pid- pi-*) non-past, transitive, 3SG patient (built from Paudyal 2013: 294).

consonant-initial suffixes (the dual forms). The distribution of the stems in transitive verbs (see Table 4) is also the same as in Athpariya.

2.3. Yakkha (data from Schackow 2016)

In Yakkha, as in closely related Athpariya and Chintang, the verb stem allomorphy is predictable from the form of the following suffix. Thus, we can distinguish between prevocalic (also /w/) stems and those that occur before consonants (other than /w/) or before word breaks. The following formal alternations are involved:

_V _C	_V _C
s ∼ Ø	r ∼ Ø/ʔ
ps ∼ m	k ∼ g
ks ∼ ŋ	b ∼ p
Nd ∼ N	ʔ ∼ Ø
Ct ∼ C	

Although the form of the suffixes is different, the distribution in the paradigm of the two stems (see Table 5) is one which should result familiar by now. The prevocalic stem appears, in non-past tense intransitive verbs, in the 1PL and 2PL

https://doi.org/10.1017/S0022226720000341 Published online by Cambridge University Press

	SG	DU	PL
1EXCL	am-meŋna	am-meŋciŋha	ab-iwaŋha
1INCL		am-meciya	ab-iwha
2	am-mekana	am-mecigha	ab-iwagha
3	am-meʔna	am-meʔciya	ŋ-am-mehaci

Table 5
Paradigm of Yakkha 'come' (*ap- ab-*) non-past, intransitive (Schackow 2016: 243).[3]

	SG	DU	PL
1EXCL	tund-waŋna	tum-meŋcuŋna	tund-wamŋana
1INCL		tum-mecuna	tund-wamna
2	tund-wagana	tum-mecugana	tund-wamgana
3	tund-wana	tum-mecuna	n-dund-wana

Table 6
Paradigm of Yakkha 'understand' (*tund- tun-*) non-past, transitive, 3SG patient (Schackow 2016: 244).

forms. Also in the same way as in the related languages presented so far, the past and the perfect forms in Yakkha contain exclusively the prevocalic stem alternant (i.e. *ab-*). This is so because the forms start with a suffix *-a*, except the 1PL and 2PL, which have *-i*.

Consider now the allomorphy of the stem in transitive verbs (Table 6). As in other Eastern Kiranti languages, prevocalic stems appear before singular and plural forms. The past and the perfect, as in the intransitive conjugation, have the prevocalic stem throughout the paradigm as the prefix *-a* occurs before duals and *-u* elsewhere.

2.4. Limbu (data from van Driem 2011)

Verbs in Limbu (except those ending in /m/ or /ŋ/ have two stems, whose distribution in the paradigm is also predictable from the vowel- or consonant-initial character of the suffixes. The formal alternations involved, however, are somewhat more complex and lexicalized compared to the Greater Yakkha languages presented so far:

_V _C	_V _C
Ct ∼ C	g ∼ k
Nd ∼ N	b ∼ p
Ns ∼ N	tch ∼ t

[3] *Note:* /p/ and also /n/ in Table 6 are assimilated to a following /m/ in a productive phonological process.

https://doi.org/10.1017/S0022226720000341 Published online by Cambridge University Press

	SG	DU	PL
1EXCL	nuːŋ-ʔɛ	nuːŋ-sige	nuːks-ige
1INCL		a-nuːŋ-si	a-nuːŋ
2	kɛ-nuːŋ	kɛ-nuːŋ-si	kɛ-nuːks-i
3	nuːŋ	nuːŋ-si	mɛ-nuːŋ

Table 7
Paradigm of Limbu 'return' (*nuːŋ- nuːks-*) non-past, intransitive (van Driem 2011: Appendix II).

	SG	DU	PL
1EXCL	huʔr-uŋ	huʔ-suge	huʔr-umbe
1INCL		a-huʔ-su	a-huʔr-um
2	kɛ-huʔr-u	kɛ-huʔ-su	kɛ-huʔr-um
3	huʔr-u	huʔ-su	mɛ-huʔr-u

Table 8
Paradigm of Limbu 'teach' (*huʔr- huʔ-*) non-past, transitive, 3SG patient (van Driem 2011: Appendix II).

ps ∼ m	nch ∼ n
ks ∼ ŋ	tch ∼ n
s/r ∼ Ø	(ʔ)r ∼ n
(ʔ)r ∼ ʔ	(ʔ)r ∼ t
Vːr ∼ V(ː)ʔ	V(ː)y ∼ Vː

As can be seen above, due to the nature of the alternations, a prevocalic stem cannot always be used to predict the corresponding preconsonantal one or *vice versa*. For example, /n/ is found in the preconsonantal stem of verbs with various prevocalic forms: *-nd*, *-tch*, *-nch*, *-ʔr* or *-r*. Conversely, a stem-final /r/ in a prevocalic stem can correspond variously to -Ø, *-n*, *-t* or *-ʔ* in the pre-consonantal stem. Because of this, and although predictability of the preconsonantal stem still holds generally, the alternants of some verbs need to be listed in the lexicon in some way despite their being distributed in the paradigm in a phonologically predictable way.

Table 7 shows the paradigmatic distribution of the stems in intransitive verbs. Prevocalic stems appear, in the non-past, only in the 1PL.EXCL and in the 2PL forms. As for the past tense, the stems in all the forms are prevocalic (a suffix *-ɛ* marks the past in most cases) except for the one in the 1PL.EXCL.

The distribution of stem alternation in transitive verbs is shown in Table 8. The same as in the other Greater Yakkha languages presented before, vowel anterior stems appear in the singular and in the plural. In the past, all forms are prevocalic

https://doi.org/10.1017/S0022226720000341 Published online by Cambridge University Press

except for the 1PL.EXCL which, as in the case of intransitive verbs, has the form *-mʔna* and lacks the *-u* suffix that characterizes other past forms.

2.5. Yamphu (data from Rutgers 1998)

Verb alternation in Yamphu is also structured according to the prevocalic versus preconsonantal dichotomy. The following alternations are found:

_V _C	_V _C
Ct ∼ C	ps ∼ m
s ∼ Ø	b ∼ p
d ∼ Ø	d ∼ t
ks ∼ ŋ	g ∼ k
ss ∼ n	Vs ∼ V:

In addition to these, some verbs have a third stem in V: which appears in the non-past and in the perfect (both paradigms with consonant-initial suffixes only). In the intransitive non-past paradigm (Table 9), only the preconsonantal stem can appear. Because all the suffixes start with a consonant (note the presence of a suffix *-mi*), only the preconsonantal stem (i.e. *ap-*) appears in the non-past. The same happens in the perfect, since all the forms start with *t-*. The opposite is the case in the past: because all the forms have a vowel (*-i* in 1SG and 1PL, *-a* elsewhere) immediately after the stem, the only alternant to appear in the past is the vowel anterior one (i.e. *ab-*).

The only tense to display the two stem alternants in Yamphu is the negative non-past (see Table 10). In this paradigm, the 1PL and 2PL have the prevocalic stem, opposed to the preconsonantal one in the rest of the cells. Note that this distribution of stem alternation is the same that was present in the earlier languages Athpariya, Chintang and Yakkha. The picture in transitive verbs is similar to the one in intransitives (see Table 11), where the preconsonantal stem *haŋ-* is found all over the positive non-past, since all the forms start with the suffix *-ʔi*(*n*(*d*)). The same is true of the perfect, since all the forms start with *-t*. Also the same as in intransitive verbs, the

	SG	DU	PL
1EXCL	ap-miŋa	ap-minjiŋa	ap-mindiŋma
1INCL		ap-minji	ap-mindi
2	ap-mi	ap-minji	ap-mindaniŋ
3	ap-mi	ap-minji	ap-mimmi

Table 9
Paradigm of Yamphu 'come' (*ab- ap-*) non-past, intransitive (Rutgers 1998: 601).

https://doi.org/10.1017/S0022226720000341 Published online by Cambridge University Press

	SG	DU	PL
1EXCL	ap-ŋani	ap-ciŋani	ab-iŋmani
1INCL		ap-cini	ab-ini
2	ap-ni	ap-cini	ab-aniŋni
3	ap-ni	ap-cini	ap-mini

Table 10
Paradigm of Yamphu 'come' (*ab- ap-*) neg. n-past, intransitive (Rutgers 1998: 602).

	SG	DU	PL
1EXCL	khaŋ-ʔinuŋ	khaŋ-ʔinjuŋ	khaŋ-ʔinduŋma
1INCL		khaŋ-ʔi	khaŋ-ʔi
2	khaŋ-ʔindu	khaŋ-ʔinju	khaŋ-ʔindanum
3	khaŋ-ʔindu	khaŋ-ʔinju	khaŋ-ʔinduji

Table 11
Yamphu 'see' (*khaks- khaŋ-*) non-past, transitive, 3SG patient (Rutgers 1998: 113).

	SG	DU	PL
1EXCL	khaks-uŋni	khaŋ-juŋni	khaks-uŋmani
1INCL		khaŋ-ni	khaŋ-ni
2	khaks-uni	khaŋ-juni	khaks-anumni
3	khaks-uni	khaŋ-juni	khaks-ujini

Table 12
Paradigm of Yamphu 'see' (*khaks- khaŋ-*) negative non-past, transitive, 3SG patient (Rutgers 1998: 113).

past tense forms are all characterized by the prevocalic stem (i.e. *khaks-*) and the non-past negative by an alternation between the two stems (see Table 12). In this tense, similarly to stem alternation in other Eastern Kiranti languages, dual forms (and also, in Yamphu, the 1PL.INCL which is syncretic in the language with the 1DU.INCL) have the preconsonantal stem and the other forms the prevocalic one.

3. Central Kiranti

3.1. Bantawa (data from Doornenbal 2009)

Despite being related to East Kiranti languages much more distantly, Bantawa verbs are also usually structured around two stems, a prevocalic one and a preconsonantal

https://doi.org/10.1017/S0022226720000341 Published online by Cambridge University Press

one, which also appears word-finally. Stems with a final vowel, /m/ or /ŋ/ do not alternate. These are the forms involved:

_V _C	_V _C
w/y ∼ Ø	r ∼ t
ʔ/s ∼ Ø	ʔ ∼ k
w/ʔ ∼ p	l/r ∼ n
Ct ∼ C	y/ʔ ∼ n
Cs ∼ C	

Even if the presence of one stem or another can be predicted from the shape of the suffixes, the form of a stem is not always predictable from the form of the other. As the forms above indicate, a prevocalic stem in *-r*, for example, can correspond to a preconsonantal one in *-t* or in *-n*. Conversely, a preconsonantal stem in *-n* can correspond to *-l*, *-r*, *-y* or *-ʔ* before a vowel. Because of this, some of the stems (or alternatively membership in one of the stem alternation classes) have to be stored in the lexicon somehow.

As in the Greater Yakkha languages (Athparira, Chintang and Yakkha), the prevocalic stem appears in Bantawa non-past intransitive paradigm (see Table 13) in the 1PL and 2PL forms. Also as in these languages, the past tense shows the prevocalic stem exclusively because a suffix *-a* characterizes all the forms except the 1PL and 2PL which are syncretic with the non-past.

Similarly to East Kiranti languages again, Bantawa uses the prevocalic stem in the SG and PL (except for 3PL) forms of the transitive non-past paradigm (Table 14). As in these languages, the prevocalic stem is used in the past everywhere too except in 1>2 forms. DU and 3PL forms take a suffix *-a* opposed to the rest of the forms which start with *-u* and are syncretic with the non-past.

3.2. Puma (data from Sharma 2014)

The behaviour of stem alternation in Puma is similar to the one in Bantawa and East Kiranti languages and is also based on the same distinction between the stem in

	SG	DU	PL
1EXCL	kon-ŋa	kon-ca	kol-inka
1INCL		kon-ci	kol-in
2	ti-kon	ti-kon-ci	ti-kol-in
3	kon	kon-ci	mi-kon

Table 13
Paradigm of Bantawa 'walk' (*kon- kol-*) non-past, intransitive (Doornenbal 2009: 391).

https://doi.org/10.1017/S0022226720000341 Published online by Cambridge University Press

	SG	DU	PL
1EXCL	kʰatt-uŋ	kʰat-cuʔa	kʰatt-umka
1INCL		kʰat-cu	kʰatt-um
2	ti-kʰatt-u	ti-kʰat-cu	ti-kʰatt-um
3	kʰatt-u	i-kʰat-cu	i-kʰat

Table 14
Paradigm of Bantawa 'take' (*kʰatt- kʰat-*) non-past, transitive, 3SG patient (Doornenbal 2009: 397).

	SG	DU	PL
1EXCL	im-ŋa	im-cika	ips-eka
1INCL		im-ci	ips-e
2	tʌ-im	tʌ-im-ci	tʌ-ips-e
3	im	pʌ-im-ci	mʌ-im

Table 15
Paradigm of Puma 'sleep' non-past, intransitive (Sharma 2014: 424).

prevocalic and in preconsonantal contexts. The following forms have been found to alternate:

_V _C	_V _C
Cd ∼ C	ks ∼ ŋ
Cdh ∼ C	ss ∼ n/Ø
Ct ∼ C	ps ∼ m
Cs ∼ C	r/s/l ∼ n

The paradigmatic distribution of these alternations is identical to the one that was presented for Bantawa in the previous section.

Looking at the intransitive paradigm (Table 15), it can be seen that the longer stem appears in the 1PL and the 2PL cells, which are the ones characterized by vowel-initial suffixes. Also as in Bantawa, only the prevocalic stem appears in the past tense.

In transitive verbs (Table 16), SG and 1/2PL are characterized, as in Bantawa, by the longer, prevocalic stem. The past tense is characterized by the prevocalic forms as well.

3.3. Camling (data from Ebert 1997b)

In Camling, verbs (except those ending in a vowel and most of those ending in a sonorant) also display prevocalic and preconsonantal stems. These alternations are found:

https://doi.org/10.1017/S0022226720000341 Published online by Cambridge University Press

	SG	DU	PL
1EXCL	ɖher-uŋ	ɖhe-cika	ɖher-umka
1INCL		ɖhe-ci	ɖher-um
2	tʌ-ɖher-i	tʌ-ɖhe-ci	tʌ-ɖher-um
3	ɖher-i	pʌ-ɖhe-ci	pʌ-ɖhe

Table 16
Paradigm of Puma 'beat' non-past, transitive, 3SG patient (Sharma 2014: 439).

	SG	DU	PL
1EXCL	khat-unga	khat-acka	khat-i(m)ka
1INCL		khat-aci	khat-i
2	ta-khat-a	ta-khat-aci	ta-khat-i
3	khat-a	khat-aci	mi-khat-a

Table 17
Paradigm of Camling 'go' (*khat- khai-*) aorist, intransitive (Ebert 1997b: 69).

_V _C	_V _C
Ct ∼ C	ak ∼ o/ak
Cd ∼ C	ik ∼ yu/ik
Cs ∼ C	ek ∼ yo
Vt ∼ V(i)	p(s) ∼ m
Vs ∼ V(i)	aŋ ∼ õ

The tense system of Camling differs from that of other related Kiranti languages and appears to have been restructured into an aspect-based system opposing aorist to imperfective. The former tense is cognate with the past paradigm in other East Kiranti languages. This tense (Table 17) and also the imperfective contain exclusively the prevocalic stem. However, alternation can still be found in these verbs, for example, before the consonant-initial infinitive suffix *khai-ma*. A similar situation holds in the transitive paradigm (Table 18). All the forms with a 3SG patient have the prevocalic stem alternant. The preconsonantal forms can only be found in other forms such as the 1>2SG *lo-na* or the infinitive *lo-ma*.

3.4. Kulung (data from Tolsma 1997, 1999)

Except those in stem-final *-r*, *-l*, or *-m*, most Kulung verbs have at least two, and sometimes more, stems (labelled here A, B, C, etc.) in their paradigm. Many of the

https://doi.org/10.1017/S0022226720000341 Published online by Cambridge University Press

	SG	DU	PL
1EXCL	lod-unga	lod-acka	lod-umka
1INCL		lod-aci	lod-um
2	ta-lod-yu	ta-lod-aci	ta-lod-um
3	lod-yu	pa-lod-aci	pa-lod-a

Table 18
Paradigm of Camling 'tell' (*lod- lo-*) aorist, transitive, 3SG patient (Ebert 1997b: 72).

	SG	DU	PL
1EXCL	ges-oː	ges-cika	ges-yaka
1INCL		ges-ci	ges-ya
2	ges-e	ges-ci	ges-ni
3	ges-e	ges-e	ges-e

Table 19
Paradigm of Kulung 'laugh' (*ges- ge-*) non-past, intransitive (Tolsma 1999: 182).

forms involved in stem alternation in Kulung are familiar from other Kiranti languages:

A B	A B	Ai Aii B
ms ∼ m	ps ∼ m	tt ∼ t ∼ i
ls ∼ l	p ∼ m	ss ∼ s ∼ Ø
rs ∼ r	at ∼ ai	ŋŋ ∼ ŋ ∼ Vː
Vs ∼ V	oŋ ∼ oː	nn ∼ n ∼ i
Vks ∼ Vː	en ∼ eː	pp ∼ p ∼ m

There are also in Kulung a number of stem alternations involving just vowels (e.g. *uː* ∼ *u*, *iː* ∼ *i*, *o* ∼ *ə* ∼ *a*, etc.) which are, in general, more recent than the consonant alternations that are being addressed here. Because they constitute independent innovations of some of the daughter languages, they will not be the focus of the present paper.

As opposed to the Kiranti languages that have been surveyed here so far, stem alternation in Kulung has been completely morphologized. This means that stem alternation cannot be associated with any particular phonological context in the language. Thus, contrary to the varieties described so far, a factor such as the vowel-initial or consonant-initial form of the following suffix is not the deciding one for stem alternation in Kulung.

In the intransitive paradigm (Table 19), the longer stem (i.e. the prevocalic one in other Kiranti languages) appears in the paradigm of 'laugh' in every cell of the

https://doi.org/10.1017/S0022226720000341 Published online by Cambridge University Press

non-past regardless of the form of the suffix. This is also the case for the past and the negative non-past. Only in the negative past paradigm does the shorter stem *ge-* appear, again in all the forms and independently of the form of the suffix (compare e.g. 1DU.INCL *maŋ-ge-ci* to *ges-ci* or 1PL.INCL *maŋ-ge-yi* to *ges-ya*).

Even if the phonological determination account fails in synchrony, it has to be acknowledged that there is still a tendency for the longer stem alternant to occur before vowel-initial suffixes and for the shorter one to occur before consonant-initial suffixes. This is so because, for example, a preterite suffix *-a* usually follows the stem in the past positive forms (e.g. 1DU.INCL *ges-a-ci*, 3 *ges-a*) but this suffix is absent from the corresponding negative forms (e.g. 1DU.INCL *maŋ-ge-ci*, 3 *maŋ-ge*). Some other times, the person suffix of the negative past is consonant-initial (e.g. 1SG *-ŋa*, 2SG *-na*) whereas the one in the other tenses is vowel-initial (e.g. 1SG *-o*/*-oː*, 2SG *-e*/*-a*).

Those cases in which consonant alternations are present within a single tense involve three-way quantity alternations (i.e. *tt ~ t ~ i*, *ss ~ s ~ Ø*, *ŋŋ ~ ŋ ~ Vː*, *nn ~ n ~ i*, *pp ~ p ~ m*) that very much resemble consonant gradation as found in some Finnic and Saami languages (see Table 20). The longer stems tend to be found with the shortest affixes and the most lenited ones with the affixes with the most phonetic substance (i.e. with long vs. short vowels, or with two segments vs. one, etc.).

More concretely, the 'strongest' stem is found in the (syncretic) 2SG and 3 forms in both non-past (*att-e*) and past (*att-a*). In the negative non-past only *at-* is found. The most lenited stem(s) appear, as in the case of two-way alternations (e.g. *ges-ge-*), in the negative past. This is the situation found in Kulung intransitive verbs. Transitive verbs are note very different. As shown in Table 21, the longer stem *hoks-*

	SG	DU	PL
1EXCL	at-oː	at-cika	at-yaka
1INCL		at-ci	at-ya
2	att-e	at-ci	at-ni
3	att-e	att-e	att-e

Table 20
Paradigm of Kulung 'return' (*att- at- ai-*) non-past, intransitive (Tolsma 1999: 157).

	SG	DU	PL
1EXCL	hoks-oː	hoks-cuka	hoks-amka
1INCL		hoks-cu	hoks-am
2	hoks-ə	hoks-cu	hoks-num
3	hoks-ə	hoks-əci	hoks-əci

Table 21
Paradigm of Kulung 'throw away' (*hoks- hoː-*) non-past, transitive, 3SG patient (Tolsma 1999: 165).

https://doi.org/10.1017/S0022226720000341 Published online by Cambridge University Press

	SG	DU	PL
1EXCL	hep-oː	hep-cuka	hep-amka
1INCL		hep-cu	hep-am
2	hepp-ə	hep-cu	hep-num
3	hepp-ə	hepp-əci	hepp-əci

Table 22
Paradigm of Kulung 'embrace' (*hepp- hep- hem-*) non-past, transitive, 3SG patient (Tolsma 1999: 171).

appears, in the non-past, in every person with a 3SG patient. The short stem *hoː-* appears only in the 1SG>2 forms and, as in intransitives, through the negative past. Also as in intransitive verbs, only three-way quantity-based consonant alternations result in more than one stem appearing in a paradigm. In transitive verbs (Table 22), the 'strongest' stem is found, in the non-past, in the 2SG and 3 forms. In the past, however, the stem *hepp-* is restricted to the 2SG and 3SG forms (*hepp-u*) as 3NSG has *hep-ci*. As before, the most lenited stem *hem-* is found in 1SG>2 forms and through the negative past.

4. West Kiranti

4.1. Sunwar (data from Borchers 2008)

Sunwar verbs are very different from those of other Kiranti languages, both East and West. For example, unlike the languages presented so far, Sunwar transitive verbs agree only with their subject. In addition, also unlike in other Kiranti languages, there are different (affixal) inflection classes in the language.[4] According to Borchers (2008: 110), there do not seem to be strong predictability relations between conjugation membership and stem alternation and because of this I will not refer to conjugations again here. Stem alternation in Sunwar is purely morphological and based upon the appearance, in certain cells of the past tense, of various segments to the right of the stem. The following formal alternations can be found:

A B	A B C	A B Ci Cii Ciii
d(a) ∼ Ø	p ∼ m ∼ Ø	p ∼ m ∼ ĩ ∼ i ∼ Ø
g(a) ∼ Ø		
ŋ(a) ∼ Ø		

[4] The conjugations appear to have emerged from the loss of inflectional agreement of transitive verbs with the patient argument. Because transitives and intransitives have thus fallen together in their inflectional behaviour in Sunwar they will no longer be presented separately here.

https://doi.org/10.1017/S0022226720000341 Published online by Cambridge University Press

	SG	DU	PL
1	jo-nuŋ	jo-nasku	jo-niki
2	jo-ne	jo-nisi	jo-nini
3	jo-ba	jo-nisi	jo-nimi

Table 23
Paradigm of Sunwar 'understand' (*jog- jo-*) non-past (Borchers 2008: 200).

	SG	DU	PL
1	ma-jog-u	ma-jo-sku	ma-jo-ka
2	ma-jog-i	ma-jo-si	ma-jo-ni
3	ma-jog-a	ma-joga-se	ma-joga-me

Table 24
Paradigm of Sunwar 'understand' (*jog- jo-*) neg. past (Borchers 2008: 200).

Verbs ending in *-m*, *-r*, *-l* or *-p*, and most of the ones ending in a vowel have an invariable stem throughout the paradigm. The non-past of a verb will be presented below to allow for comparisons with other Kiranti languages, but it should be emphasized that stem alternations can only ever be found in Sunwar in the past tense.

In the non-past, as Table 23 shows, only the shorter stem alternant may be found. This makes phonotactic sense in that all the non-past suffixes start in a consonant, usually *-n*. The same happens in the negative non-past, which makes use of the same suffixes. The situation is different in the negative past. In the case of 'understand', as Table 24 shows, the form *-g(a)* appears in the negative past in the SG and in the third person. In other lexemes, by contrast, these 'stem extensions' (*-d*, *-g* or *-ŋ*) only occur in the singular forms. Note that their exact form (e.g. *-ga* vs. *-g*) depends on whether the following suffix starts with a vowel or with a consonant, which is again phonotactically convenient. Other patterns of stem alternation in Sunwar are not. Consider, for example, the stem alternations that can be found in the positive past (Table 25). Here, a stem alternant[5] ending in *-p* occurs in the 2SG and 3SG and one in *-m* occurs in the 3DU and 3PL. Note that these stem alternations of the past positive cannot be attributed to any phonological factor, since the stem here is always

[5] It is difficult to know how to best analyze these forms. For Sunwar, Borchers (2008: 113) considers them part of the stem. In Bahing, Michailovsky (1975: 191) described them as 'epenthetic consonants' or as 'reduplicative epentheses'. A phonological motivation for the epentheses would be, however, utterly obscure. They are limited to the class of open (i.e. vowel-final) stems and to the past tense. Sometimes the introduced segment appears to match a segment of the person–number suffix, which is the reason why they were analyzed as 'reduplicative' by Michailovsky. This is by no means systematic, however (consider *lan-taja*, or *gip-ta* in Tables 28 and 19, respectively). Because of this, as Borchers (2008) did, these segments will be analyzed as part of the stem here.

https://doi.org/10.1017/S0022226720000341 Published online by Cambridge University Press

	SG	DU	PL
1	cine-ta	cine-tāsku	cine-taka
2	cinep-tī	cine-tisī	cine-tinī
3	cinep-tu	cinem-tāse	cinem-teme

Table 25
Paradigm of Sunwar 'know' (*cinep- cinem- cine-*) past (Borchers 2008: 203).

	SG	DU	PL
1	pa-ta	paĩ-tāsku	paĩ-taka
2	pap-tī	paĩ-tisī	paĩ-tinī
3	pap-tu	pam-tāse	pam-teme

Table 26
Paradigm of Sunwar 'do' (*pap- pam- paĩ- pai- pa-*) past (Borchers 2008: 203).

followed by the past suffix *-t*. The same forms occur in the main other stem alternation pattern in Sunwar (Table 26). To the forms already mentioned, this other stem alternation class adds a stem alternant in *-ĩ* in the first and second person dual and plural, and a stem in *-i* in all the non-past forms.

4.2. Bahing (data from Hodgson 1858 and Michailovsky 1975)

Stem alternation in Bahing has a certain resemblance to that of closely related Sunwar. The following forms can be involved in it:

A B	A B C	A B C D E
p ∼ m	p ∼ b ∼ m	k ∼ n ∼ m ∼ p ∼ Ø
k ∼ ŋ	k ∼ g ∼ ŋ	
ŋ ∼ Ø	t ∼ d ∼ n	
n ∼ Ø		

Unlike in Sunwar, however, transitive verbs continue to agree with the patient argument and their inflectional (and stem alternation) profile differs considerably from intransitives. For this reason they will be once again treated separately.

Table 27 shows an illustrative paradigm of the non-past intransitive. It shows that some stop-final stems have a nasalized allomorph in the singular and in the plural (except the 1PL.EXCL). The past has *bok-* throughout and is marked by a suffix *-t*. By contrast, in vowel-final stems (Table 28), alternations are found in the past. Various stem augments (*-k*, *-n* and *-m*, and also *-p* in transitives, see Table 29) appear in the

https://doi.org/10.1017/S0022226720000341 Published online by Cambridge University Press

	SG	DU	PL
1EXCL	boŋ-ŋa	bok-su	bok-ka
1INCL		bok-sa	boŋ-ja
2	boŋ-e	bok-si	boŋ-ni
3	boŋ	bok-se	boŋ-me

Table 27
Paradigm of Bahing 'rise' (*bok- boŋ-*) non-past, intransitive (Michailovsky 1975: 189).

	SG	DU	PL
1EXCL	la-ti	la-tasu	lak-tako
1INCL		la-tasa	lan-taja
2	la-te	la-tasi	lan-tani
3	la-ta	la-tase	lam-tame

Table 28
Paradigm of Bahing 'go' (*lak- lan- lam- la-*) past, intransitive (Michailovsky 1975: 189).

	SG	DU	PL
1EXCL	gi-tɔŋ	gi-tasu	gik-takə
1INCL		gi-tasa	gin-taja
2	gip-ti	gi-tasi	gin-tani
3	gip-ta	gi-tase	gim-tame

Table 29
Paradigm of Bahing 'give' (*gik- gin- gim- gip- gi-*) past, transitive, 3SG patient (Michailovsky 1975: 194).

past paradigm of open stem verbs in Bahing. Some of these were also found in closely related Sunwar, where their distribution in the paradigm, however, is not always the same. The stem alternation patterns characteristic of stop-final stems are given in Table 30. These involve voicing and nasalization. It must be noted that, despite what may appear to be the case in this table, these changes are not phonological (recall the 2SG imperative form *typ-ə*). The past tense forms are marked by a suffix *-t* and show only the stem *typ-*. Unlike in other Kiranti languages, the stems with the old valency-changing suffixes *-t* or *-s* do not give rise to any stem alternations because an epenthetic vowel *-i* is inserted in Bahing before consonant-initial suffixes (e.g. *phikt-i-ka* 'dress.1PL.EXCL').

https://doi.org/10.1017/S0022226720000341 Published online by Cambridge University Press

	SG	DU	PL
1EXCL	tub-u	tup-su	typ-ka
1INCL		typ-sa	tym-ja
2	tyb-i	typ-si	tym-ni
3	tyb-a	typ-se	tym-me

Table 30
Paradigm of Bahing 'beat' (*typ- tyb- tym-*) non-past, transitive, 3SG patient (Michailovsky 1975: 190).

	SG	DU	PL
1EXCL	bʊk-ŋo	bʊk-tshok	bʊk-kok
1INCL		bʊk-tshik	bʊk-ke
2	bʊk	bʊk-tshik	bʊk-ne
3	bʊk	bʊk-tshik	bʊk-me

Table 31
Paradigm of Wayu 'get up' (*bʊk- bʊŋ-*) non-past, intransitive (Michailovsky 1988: 81).[6]

4.3. Wayu (data from Michailovsky 1988)

Consonantal stem alternation in Wayu is also purely morphological but relatively simple compared to other Western Kiranti languages. The formal alternations found in the stem are:

A B	A B
p ∼ m	k ∼ ŋ
t ∼ n	t ∼ Ø

Unlike in Bahing, these stem alternations do not occur in the non-past (see Table 31). All the person-number combinations in this tense use the stem *bʊk-*. This, however, is not what we find in the past (Table 32), where 2/3SG and 2/3PL use the stem alternant *bʊŋ-*. In a polarity-like fashion, this alternation resembles the one found in Bahing non-past (Table 27).

The paradigmatic distribution of *p ~ m* and *t ~ n* is the same. In transitive verbs, the nasal stem alternant occurs, with a 3SG patient, in the 1SG non-past and in the 2PL past (2PL, 3SG and 3PL past are marked with the suffix *-ko* instead of the nasalized stem). As for the *-t* augment, alternating intransitive verbs in *t* ∼ Ø (there are also non-alternating ones with *-t* or Ø throughout the paradigm) have the shorter stem in the past and non-past (e.g. *phi-ŋo* 'come-1SG.NP', *phi* 'come.2/3SG.NP') and only

[6] *Note:* Morphophonologically regular changes like *bʊk-ŋo* > *bʊʔŋo* or *bʊk-kok* > *bʊxkok* have not been indicated in the transcription.

https://doi.org/10.1017/S0022226720000341 Published online by Cambridge University Press

	SG	DU	PL
1EXCL	bʊk-suŋ	bʊk-tshoŋ	bʊk-koŋ
1INCL		bʊk-tshiŋ	bʊk-keŋ
2	bʊŋ	bʊk-tshe	bʊŋ-ne
3	bʊŋ	bʊk-tshe	bʊŋ-me

Table 32
Paradigm of Wayu 'get up' (*buk- buŋ-*) past, intransitive (Michailovsky 1988: 81).

participles and gerunds use the longer stem in *-t* (e.g. *phit-ji*, *phit-ta*, Michailovsky 1988: 137). In transitive verbs, the alternation between *-t* and *-Ø* may have a grammatical function. Unlike in most other Kiranti languages, the *-t* augment has sometimes preserved its valency-increasing function in Wayu and signals the applicative.

4.4. Khaling (data from Jacques et al. 2011)

Verb stem alternation in Khaling is morphological and very complex. Even limiting our attention to consonant alternations and thus leaving aside the numerous stem vowel changes found in verbal inflection, the number of possible alternations is still considerable:

A B C D	A B C	A B
nd ∼ n ∼ j ∼ ŋ	g ∼ Vː ∼ k	md ∼ m
nd ∼ i ∼ j ∼ ts	b ∼ m ∼ p	rd ∼ r
d ∼ i ∼ n ∼ ts	pt ∼ p ∼ m	ld ∼ l
	kt ∼ k ∼ Vː	
	tt ∼ ts ∼ n	

One can notice, however, that, despite the additional complications, the alternations usually involve the presence or absence of augments *-t* and *-d* and the voicings and nasalizations (e.g. *p* ∼ *b* ∼ *m*) that also appeared elsewhere in Kiranti. The distribution of these consonant alternations in the intransitive non-past paradigm of Khaling is shown is Table 33. Note that, despite what might seem to be the case in this table, the assimilation of /p/ to a following nasal suffix is not a regular phonological rule of the language and is purely morphological. This can be seen in forms like 3PL *lô:p-nu* in the transitive paradigm in Table 34.

In transitive paradigms with a 3SG object held constant, the voiced stem-final consonant appears in the singular cells. This is the same pattern that was presented in Bahing (Table 30). In Khaling, this is also the domain for the occurrence of the

https://doi.org/10.1017/S0022226720000341 Published online by Cambridge University Press

	SG	DU	PL
1EXCL	soɔ̂m-ŋʌ	səp-u	soɔp-kʌ
1INCL		səp-i	soɔp-ki
2	ʔi-soɔp	ʔi-səp-i	ʔi-soɔ̂m-ni
3	soɔp	səp-i	soɔ̂m-nu

Table 33
Paradigm of Khaling 'have enough' (*sop-*) non-past, intransitive (Jacques et al. 2011: 1102).

	SG	DU	PL
1EXCL	lob-u	ləp-u	loɔp-kʌ
1INCL		ləp-i	loɔp-ki
2	ʔi-lō:b-ʉ	ʔi-ləp-i	ʔi-loɔ̂m-ni
3	lō:b-ʉ	lô:p-su	lô:p-nu

Table 34
Paradigm of Khaling 'catch' (*lop-*) non-past, transitive, 3SG patient (Jacques et al. 2011: 1102).

	SG	DU	PL
1EXCL	mʌ̄md-u	mim-u	mʌ̄m-kʌ
1INCL		mim-i	mʌ̄m-ki
2	ʔi-mʌ̄md-ʉ	ʔi-mim-i	ʔi-mʌ̄m-ni
3	mʌ̄md-ʉ	mʌ̂m-su	mʌ̂m-nu

Table 35
Paradigm of Khaling 'remember' (*mimt-*) non-past, transitive, 3SG patient (Jacques et al. 2011: 1120).

	SG	DU	PL
1EXCL	ʔʌ̂m-si-ŋʌ	ʔip-si-ju	ʔʌp-si-kʌ
1INCL		ʔip-si-ji	ʔʌp-si-ki
2	ʔi-ʔʌ̂m-si	ʔi-ʔip-si-ji	ʔi-ʔʌ̂m-si-ni
3	ʔʌ̂m-si	ʔip-si-ji	ʔʌ̂m-si-nu

Table 36
Paradigm of Khaling 'sleep' (*ʔip-*) past, reflexive (Jacques 2017).

stem augments in *-t/d* (see Table 35). These stems appear in the singular non-past only. It is absent from the past, understandably maybe, due to the fact that most of those forms are characterized by the past marker *-t*(*ɛ*) immediately after the stem. Note, however, that this (i.e. having an identical suffix generally) does not preclude the use of different stems (see Table 36), which proves again the morphological

https://doi.org/10.1017/S0022226720000341 Published online by Cambridge University Press

nature of stem alternation in Khaling. A nasal stem is found, in this paradigm in the singular and 2/3PL forms. Note the similarity to Bahing (Table 26) and Wayu (Table 32). In Khaling, however, this pattern is found in both past and non-past and (only second person) in the imperative.

4.5. Dumi (data from van Driem 1993)

Stem alternation in Dumi is morphologically determined (although automatic alternations also occur at morpheme boundaries) and very complex. Vowel apophony occurs as well but will not be analyzed here. The following consonant alternations can be found:

A B C D	A B	A B
tnd ∼ tnts ∼ Ø ∼ t	ts ∼ t	md ∼ m
nd ∼ nts ∼ t ∼ n	ts ∼ Ø	pt ∼ ph
nd ∼ nts ∼ Ø ∼ n	nts ∼ t	ŋd ∼ ŋ
nd ∼ nts ∼ n ∼ t	ŋ ∼ Ø	rd ∼ r
nd ∼ nts ∼ Ø ∼ n	d ∼ ts	ŋ ∼ ŋs
d ∼ ts ∼ t	nd ∼ nts	
t ∼ ts ∼ t	t ∼ ts	
nd ∼ nts ∼ t	tnd ∼ tnts	
d ∼ ts ∼ Ø	kt ∼ kh	

Different formal alternations are associated with different paradigmatic patterns. The pattern in Table 37 is a frequently encountered one in intransitive verbs. As illustrated here, a recurrent pattern of stem alternation opposes the 1PL stem to the one in the rest of the paradigm. The stem change can involve other forms like *ts*∼Ø

	SG	DU	PL
1EXCL	bus-tə	bus-ti	boʔ-kta
1INCL		bus-ti	boʔ-kti
2	a-bus-ta	a-bus-ti	a-bus-tini
3	bus-ta	bus-ti	ham-bus-ta

Table 37
Paradigm of Dumi 'shout' (*buts- bot-*) non-past, intransitive (van Driem 1993: 98).[7]

[7] *Note:* Various alternations such as between *buts-* and *bus-* and between *bot-* and *boʔ-* are morphophonological and automatic according to the analysis of van Driem (1993: 93–95).

https://doi.org/10.1017/S0022226720000341 Published online by Cambridge University Press

	SG	DU	PL
1EXCL	do:khot-tə	du:khus-ti	do:khoʔ-kta
1INCL		du:khus-ti	do:khoʔ-kti
2	a-do:khot-ta	a-du:khus-ti	a-du:khus-tini
3	do:khot-ta	do:kho-sti[8]	do:khot-tini

Table 38
Paradigm of Dumi 'see' (*du:khuts- do:khot-*) non-past, transitive, 3SG patient (van Driem 1993: 107–108).

or *ŋ*∼Ø. As Table 37 reveals, Dumi is characterized by a suffix *-t* in the non-past. The same pattern of stem alternation is found in the past, where the suffixes are the same except for the absence of *-t*.

A different pattern is found in transitive verbs (Table 38), where the 1PL patterns with SG and third person paradigm cells (/t/ changes to /ʔ/ regularly before velars). Other forms such as, crucially, the augment (e.g. *-kt* (vs. *-kh*), *-md* (vs. *-m*), *-rd* (vs. *-r*), etc.) adopt this same paradigmatic distribution. In some other lexemes (Table 39), the stem of the SG+3 and that in the 1PL may differ.

4.6. Thulung (data from Allen 1975 and Lahaussois 2002, 2011)

Stem alternation in Thulung is morphological but involves a relatively small number of forms. In addition, verbs distinguish a maximum of two stems:

A B	A B
p ∼ m	ŋ ∼ Ø
ɖ ∼ n/Ø	s ∼ Ø
k ∼ Ø	

These alternations are distributed in the paradigm in different ways. Some involve the pattern in Table 40, which stays the same across tenses (non-past

[8] Something occurs in the 3DU transitive form that is not entirely clear to me from van Driem's (1993) description. The suffix *-sti* is, according to him, an infixation of the usual non-past suffix *-t* into the dual suffix *-si* (van Driem 1993: 146–147). The latter is a form which does surface in the 3DU past form *do:khos-si*. Without this process of infixation, and with the expected stem alternant *do:khot-*, the form *do:kot-t-si* would have been expected, which is an impossible sequence. If the infixation of *-t* was posterior (in some sense) to some sort of degemination of the *-tt* in coda, then we may derive the attested form: *do:kot-t-si* > *do:kho*(-)*t-si* > *dokho-s*<*t*>*i*. This, however, would not work for the past form *do:khos-si*, where the form **do:khot-si* would be expected. There is, to the best of my knowledge, no problem whatsoever with the sequence *ts* in Dumi and no morphophonological rule such as /t/ > /s/ _s. Van Driem, however, does not find evidence to consider these forms a stem different from the one in the other shaded forms of Table 32 above and I will simply follow his analysis here.

https://doi.org/10.1017/S0022226720000341 Published online by Cambridge University Press

	SG	DU	PL
1EXCL	phiŋkhotn-tə	phiŋkhos-ti	phiŋkho-kta
1INCL		phiŋkhos-ti	phiŋkho-kti
2	a-phiŋkhotn-ta	a-phiŋkhos-ti	a-phiŋkhos-tini
3	phiŋkhotn-ta	phiŋkhotn-sti	phiŋkhotn-tini

Table 39
Paradigm of Dumi 'send off' (*phiŋkhotnd- phiŋkhotnts- phiŋkho-*) non-past (van Driem 1993: 111–112).

	SG	DU	PL
1EXCL	ɖu-u	ɖu-tsuku	ɖu-ku
1INCL		ɖu-tsi	ɖuŋ-i
2	ɖu-na	ɖu-tsi	ɖu-ni
3	ɖuŋ-y	ɖu-tsi	ɖu-mi

Table 40
Paradigm of Thulung 'drink' (*ɖu- ɖuŋ-*) non-past, transitive, 3SG patient (Lahaussois 2002: 162).

	SG	DU	PL
1EXCL	ge-ŋu	ge-tsuku	ge-ku
1INCL		ge-tsi	geɖ-ɖi
2	ge-na	ge-tsi	ge-ni
3	ge	ge-tsi	ge-mi

Table 41
Paradigm of Thulung 'come (up)' (*geɖ- ge-*) non-past, intransitive (built from Allen 1975: 204).[9]

vs. past). The same pattern found in 'drink' is found with the stem extension *-s* in other verbs. In the intransitive paradigm, where 3SG is -Ø, these segments will be limited to the 1PL.INCL. Other patterns of stem alternation are more complicated in that the distribution of the stems is also dependent on tense. In general, the longer or 'stronger' stem tends to appear in the past and the shorter or more lenited one in the present but the correlation to tense is not perfect. As Tables 41 and 42 illustrate, 1PL.INCL of the present and all the past forms except the 1SG and 3PL have the longer stem in *-ɖ* (*ɖ* ~ *t* variation is allophonic). The forms *-p* (vs. *-m*), *-k* (vs. -Ø) and *-ɖ* (vs. *-n*) are also subject to the same paradigmatic distribution.

[9] *Note:* A complete paradigm of an intransitive verb with these alternations is not given but can be constructed from the description.

https://doi.org/10.1017/S0022226720000341 Published online by Cambridge University Press

	SG	DU	PL
1EXCL	ge-ŋroro	get-tsoko	get-toko
1INCL		get-tsi	geɖ-ɖi
2	geɖ-na	get-tsi	geɖ-ni
3	geɖ-ɖa	get-tsi	ge-miri

Table 42
Paradigm of Thulung 'come (up)' (*geɖ- ge-*) past, intransitive (built from Allen 1975: 204).

	SG	DU	PL
1EXCL	rep-u	rem-tsuku	rem-ku
1INCL		rem-tsi	rep-i
2	rem-na	rem-tsi	rem-ni
3	rep-y	rem-tsi	rem-mi

Table 43
Paradigm of Thulung 'look' (*rem- rep-*) non-past, transitive, 3SG patient (Lahaussois 2002: 158).

	SG	DU	PL
1EXCL	rep-to	rep-tsoko	rep-ku
1INCL		rep-tsi	rep-ɖi
2	rep-na	rep-tsi	rep-ni
3	rep-ɖy	rep-tsi	rep-miri

Table 44
Paradigm of Thulung 'look' (*rem- rep-*) past, transitive, 3SG patient (Lahaussois 2002: 158).

A similar situation (with a slightly different distribution) is found in transitive verbs (Table 43). The stronger stem appears, in the non-past, in the 1SG, 1PL.INCL and 3SG (this stem can sometimes appear in the 3PL too). In the past (Table 44), however, this stem *rep-* appears in all person-number combinations (although the 3PL may occasionally inflect with the weaker stem). This pattern can also be instantiated with the forms *-k* (vs. -Ø) and *-ɖ* (vs. *-n* or -Ø).

4.7. Koi (data from Lahaussois 2009)

Stem alternation in Koi is difficult to classify. Different analyses (phonological conditioning and semantic, see Baerman & Corbett 2012) have been proposed. Conceding that this system poses considerable analytical challenges, I will present Koi stem alternation here as essentially morphological in nature. Even though the

https://doi.org/10.1017/S0022226720000341 Published online by Cambridge University Press

stem alternations correlate perfectly to certain formal properties of the following suffixes (-C vs. *-i/e* vs. *-a* vs. *-u*), there is no reasonable phonological rule that could generate the attested alternations. In addition, the paradigmatic distribution of some of the suffixes appears to be arbitrary from a semantic point of view and thus purely morphological. The following forms might be involved:

A B	A B C
$p^h \sim p$	$pts \sim p \sim p^h$
$pts \sim p$	$k \sim ʔ \sim ʔ$
$ŋ \sim Ø$	$ts \sim Ø \sim d$
$Ø \sim s$	$Ø \sim Ø \sim d$
$(n)ts \sim n$	

Stem-vowel alternations also occur but will not be described here. The distribution of consonantal alternations is relatively straightforward. In intransitive verbs (see Table 45) the 1SG takes one stem and the rest of the paradigm takes the other. This cell is also the one where a consonant-initial (as opposed to a vowel-initial) suffix follows the stem. The same distribution is found in the past, where the 1SG suffix also starts with a consonant and the rest with a vowel. This would point towards a phonological analysis in which the stem's final consonant appears to be dropped (or changed) before a following consonant. Note however, that some consonant alternations (most notably between a stem-final *-s* before consonant-initial suffixes and Ø in the prevocalic stem) cannot be understood in the same terms but have the exact same paradigmatic configuration.

The situation is similar in transitive verbs. Suffixes in this paradigm are different from intransitive verbs and so is the stem alternation pattern, which appears to be governed at first sight also by the vowel-initial or consonant-initial status of following suffixes. Tables 46 and 47show that many transitive verbs have a different stem in the SG and third person forms of the paradigm. In the past, the alternation most often involves the augment *-d* already familiar from other Kiranti languages. These paradigm cells are also characterized by shared forms in the suffixes. The SG +3 cells have a *d*-starting suffix in the non-past and a *u*-starting suffix in the past. The

	SG	DU	PL
1EXCL	ho-tɔ	hoŋ-isu	hoŋ-ekɔ
1INCL		hoŋ-isi	hoŋ-iki
2	hoŋ-ena	hoŋ-isina	hoŋ-ini
3	hoŋ-e	hoŋ-isi	hoŋ-ini

Table 45
Paradigm of Koi 'enter' (*hoŋ- ho-*) non-past, intransitive (Lahaussois 2009: 13).

https://doi.org/10.1017/S0022226720000341 Published online by Cambridge University Press

	SG	DU	PL
1EXCL	jɔm-dɔ	jɔmts-isu	jɔmts-ekɔ
1INCL		jɔmts-isi	jɔmts-iki
2	jɔm-dana[10]	jɔmts-isina	jɔmts-ini
3	jɔm-da	jɔm-dasi	jɔm-dani

Table 46
Paradigm of Koi 'hit' (*jɔmts- jɔm- jomd-*) non-past, transitive, 3SG patient (Lahaussois 2009: 12).

	SG	DU	PL
1EXCL	jɔmd-uŋa	jɔmts-asu	jɔmts-akɔ
1INCL		jɔmts-asi	jɔmts-aki
2	jɔmd-una	jɔmts-asina	jɔmts-ani
3	jɔmd-u	jɔmd-usi	jɔmd-uni

Table 47
Paradigm of Koi 'hit' (*jɔmts- jɔm- jomd-*) past, transitive, 3SG patient (Lahaussois 2009: 12).

other paradigm cells have *-i/e* in the non-past and *-a* in the past. The correlation of stem alternations to these suffixes might be synchronically relevant, even though the distributions of both affixes and stem alternants are semantically arbitrary.

4.8. Jerung (data from Opgenort 2005)

Jerung stem alternation is morphological, since it does not correlate with any unified phonological environment. On the other hand, it is relatively simple, since it involves few forms and patterns. Consonantal alternations in the language may involve the following:

A B	A B
pt ∼ m	tt ∼ n
kt ∼ V:	Vk ∼ V:
t ∼ Ø	

[10] Segmentations like 2SG.PRS *jɔm-dana* vs. 2SG.PAST *jɔmd-una* appear to be suspect at first sight, in that they introduce a stem alternation (*jɔm-* vs. *jɔmd-*) where, in principle, there would have been none if we segmented *jɔm-dana* and *jɔm-duna* or *jɔmd-ana* and *jɔmd-una*. The segmentation provided by Lahaussois, however, is justified in that every single transitive verb shows a *-d* in the SG+3 forms of the non-past whereas not all verbs show *-d* in the SG+3 of the past. Although the analytical uncertainty is high in this particular case (for reasons of space it will not be fleshed out here), I consider that Lahaussois's segmentation is the optimal one.

https://doi.org/10.1017/S0022226720000341 Published online by Cambridge University Press

	SG	DU	PL
1EXCL	gɔk-ma	go-cum	go-kum
1INCL		go-cim	go-kim
2	gɔk-nim	go-cim	go-nimme
3	gɔkt-im	gɔk-cim	gɔk-me

Table 48
Paradigm of Jerung 'give' (*gɔkt- go-*) (Opgenort 2005: 330).[11]

As shown above, they most frequently involve the augment *-t* already familiar from other Kiranti languages. Vowel alternations also occur in the stem but will not be considered here. Intransitive verbs can only show stem alternation between finite and non-finite forms (e.g. *blaː-me* 'come-3SG' vs. *blak-cap* 'come-INF'; Opgenort 2005: 327). There is, apparently, a tendency to level even these stem alternations in intransitive verbs by spreading the finite form of the stem to the non-finite ones.

The most interesting stem alternations, therefore, are found in transitive verbs (Table 48). Consonant alternation in Jerung, similarly to the situation in Koi, involves a stem (augmented in Jerung) used in the SG and third person forms opposed to a phonologically shorter stem in the rest of the paradigm.

4.9. Wambule (data from Opgenort 2004)

Stem alternation in Wambule is very similar to the one in closely related Jerung. It is thus, morphological in nature but relatively simple in its instantiation since it involves few forms and patterns. The consonantal alternations at the end of the stem can be the following:

A B	A B
pt ∼ m	t ∼ n
kt ∼ Vː	Vk ∼ Vː
t ∼ Ø	Vŋ ∼ Vː
Vn ∼ Vː	

In intransitive verbs, the same as in Jerung, the only stem alternation that can be found is between the stem of finite and nonfinite forms of the paradigm (e.g. *glak* ∼ *glaː* 'win'; Opgenort 2004: 260), with the shorter stem used, as in Jerung, in finite forms, and the longer one in nonfinite ones. The distribution of stem alternation in

[11] *Note:* The alternation between *gɔkt-* and *gɔk-* is morphophonological and determined by whether a vowel or a consonant follows. Thus, in West Kiranti, phonologically conditioned stem alternations of the East Kiranti type sometimes live alongside purely morphological ones.

https://doi.org/10.1017/S0022226720000341 Published online by Cambridge University Press

	SG	DU	PL
1EXCL	twaŋ-me	to-cukme	to-kume
1INCL		to-cime	twaŋ-ime
2	twaŋ-nume	to-cime	to-nime
3	twaŋ-s-ume	twaŋ-s-ucime	twaŋ-mime

Table 49
Paradigm of Wambule 'drop' (*twaŋ- to-*) (Opgenort 2004: 874).

transitive verbs is also similar (but not identical) to the one in Jerung (see Table 49). The main difference is the presence of the longer stem in the 1PL.INCL as well and the presence of the stem augment *-s* in the 3SG and 3DU of some verbs.

5. Discussion

Stem alternation, in some form or another, has been found to be present in the verbal inflection of every single one of the 18 Kiranti languages surveyed here. The nature of stem alternation in individual languages, however, is highly variable. We can find everything from the clearly phonologically conditioned[12] alternations of Athpariya and other East Kiranti languages to the starkly morphologized and complex stem changes of Khaling and Dumi, and most other West Kiranti languages.

In addition, it has been found that the broad type of system encountered in a particular language (i.e. phonological conditioning vs. morphological alternation) correlates very well with the phylogenetic tree (see Figure 2) that is nowadays assumed for the family. All East Kiranti languages (i.e. Athpariya, Chintang, Yakkha, Limbu and Yamphu) have a two-stem alternation based on the consonantal or vocalic nature of the following suffix. All the West Kiranti languages (i.e. Sunwar, Bahing, Wayu, Khaling, Dumi, Thulung, Koi, Jerung, and Wambule) have morphological stem alternation, i.e. patterns with various distributions and degrees of complexity but which, crucially, have to be learnt independently from the form of the inflectional suffixes. Central Kiranti languages show mixed traits in this respect. Bantawa, Puma, and Camling pattern with East Kiranti and distinguish prevocalic and preconsonantal stems. Kulung, however, patterns with West Kiranti and shows irreducibly morphological stem alternation.

[12] As mentioned by Nevins (2011: 6), 'some of the most widespread instances of phonologically-conditioned allomorphy arise in the domain of syllable structure. When there are two or more allomorphs, the choice among them often is based on yielding a syllable structure that either avoids codas, avoids hiatus, or avoids complex codas without a sufficient sonority drop'. This description matches perfectly the nature of the East Kiranti stem alternations (e.g. *pid-V pi-C* in Chintang, as seen in Table 4 above, *tund-V tun-C* in Yakkha (Table 6), *ɖher-V ɖhe-C* in Puma (Table 16), etc.), which thus constitute textbook examples of what phonologically-conditioned stem alternations look like.

https://doi.org/10.1017/S0022226720000341 Published online by Cambridge University Press

It may seem that the languages with morphological stem alternation might be the most relevant and interesting for our understanding of morphology in general or the morphome in particular. It turns out here that, quite on the contrary, it is the languages with phonological conditioning of stem alternation that show the most interesting traits and developments. The most novel finding, in my opinion, is that paradigmatic distributional stability is by no means a property exclusive to purely morphological (or semantic) stem alternations. The diachronic resilience of morphomic patterns is an oft-cited property of these structures (e.g. Maiden 2005, Herce 2020a). Semantically governed stem alternations (think of e.g. present vs. past in Germanic strong verbs) also seem to be very long-lived. East Kiranti, in turn, shows us that a pattern of stem alternation can also remain remarkably stable diachronically (i.e. may preserve its actual paradigmatic distribution) despite being phonologically conditioned synchronically.

Consider again, in Tables 50 and 51, the stem alternation patterns that were presented in Section 2.1 for Athpariya (Tables 1 and 2 above, from Ebert 1997a). As Table 50 shows, the prevocalic stem is found, in intransitive verbs, in the 1/2PL non-past (and in all the past forms). In transitives (Table 51), it is found in SG and in PL forms of the non-past (and in all the forms of the past). This exact same paradigmatic distribution is found in the close relatives Chintang (Tables 3 and 4) and Yakkha (Tables 5 and 6). An almost identical distribution of stem alternation is found as well in Limbu (Tables 7 and 8), Yamphu (Tables 10 and 12), and in the Central Kiranti languages Bantawa (Tables 13 and 14), and Puma (Tables 15 and 16).

This shared structure, however, is not merely due to the preservation of the same paradigms across all these languages. As a matter of fact, many suffixes have been

	SG	DU	PL
1EXCL	khat-naʔa	khat-ciciŋa	khad-itiŋa
1INCL		khat-cici	khad-iti
2	a-khat-yuk	a-khat-cici	a-khad-iti
3	khat-yuk	khat-cici	u-khat-yuk

Table 50
Paradigmatic distribution of the prevocalic stem in non-past intransitive verbs.

	SG	DU	PL
1EXCL	lems-uŋtuŋ	lem-cucuŋa	lems-umtumma
1INCL		lem-cucu	lems-umtum
2	a-lems-utu	a-lem-cucu	a-lems-umtum
3	lems-utu	lem-cucu	o-lems-utu

Table 51
Paradigmatic distribution of the prevocalic stem in non-past transitive verbs.

https://doi.org/10.1017/S0022226720000341 Published online by Cambridge University Press

replaced, lost or changed beyond recognition in the history of these languages. For example, the 3SG intransitive suffix is *-yuk* in Athpariya, *-no* in Chintang, *-meʔna* in Yakkha, *-ni* in Yamphu, and -Ø in Limbu, Bantawa, and Puma. The 3SG transitive suffix (with a 3SG object implied) is *-utu* in Athpariya, *-oko* in Chintang, *-wana* in Yakkha, *-uni* in Yamphu, *-u* in Limbu and Bantawa, and *-i* in Puma. The 1SG intransitive suffix is *-naʔa* in Athpariya, *-maʔã* in Chintang, *-meŋna* in Yakkha, *-ʔɛ* in Limbu, *-ŋani* in Yamphu, and *-ŋa* in Bantawa and Puma.

Comparable variation is found in the prefixes. The second person prefix is *a-* in Chintang and Athpariya, Ø- in Yakkha and Yamphu, *kɛ-* in Limbu, *ti-* in Bantawa, and *tʌ-* in Puma. The 3PL intransitive prefix is *u-* in Athpariya and Chintang, *ŋ-* in Yakkha, *mɛ-* in Limbu, Ø- in Yamphu, *mi-* in Bantawa, and *mʌ-* in Puma. The 3PL transitive prefix is *o-* in Athpariya, *u-* in Chintang, *n-* in Yakkha, *mɛ-* in Limbu, Ø- in Yamphu, *i-* in Bantawa, and *pʌ-* in Puma.

The presence of many different (non-cognate) affixes in these languages necessarily means that formatives have been lost, acquired, replaced and/or changed independently in the history of these individual languages. Thus, the fact that the paradigmatic distribution of Tables 50 and 51, as well as phonological conditioning, have been preserved in the daughter languages is a most perplexing finding. Despite all the changes that have been happening in the inflectional paradigms, vowel-initial suffixes have continued to be vowel-initial and consonant-initial (or zero/Ø) suffixes have remained consonant-initial or zero.[13] This is not the case with the prefixes. Observe how the three mentioned above (e.g. the addressee prefix, consider Athpariya a- vs. Limbu *kɛ-*) contain both vowel- and consonant-initial variants in East Kiranti. This must be because whatever is constraining the possible changes and variants in suffixes does not operate in prefixes. This force can be no other than the phonologically conditioned stem alternation. My take on these developments is, thus, that the paradigmatic pattern observed in these languages' verbal stems must be being learnt by language users of and by itself; that is, independently of the actual forms of the inflectional affixes themselves. This is the only way, in my opinion, to explain the stability of the pattern in the presence of so many affixal changes.

It seems that the prevocalic versus preconsonantal form of the stem in a particular cell poses a constraint on the kind of changes or suffix substitutions that may take place in the language. Thus, for example, a vowel-initial suffix may be disfavoured as a replacement for a consonant-initial suffix. Imagine, thus, that the dual transitive

[13] It must be noted, however, that the definition of what counts as a vowel- or a consonant-initial suffix may vary slightly from one language to another. For example, in Athpariya, the suffix *-yuk* requires the stem that is otherwise used before consonants (e.g. *khat-yuk* 'go-3SG.NPST' has the same stem as *khat-cici* 'go-3DU.NPST' and a stem different from the one in *khad-iti* 'go-1PL.INCL.NPST'). By contrast, in Camling, the suffix *-yu* occurs with the same stem as vowel-initial suffixes (compare *lod-yu* 'tell-3SG.AOR' to *lod-unga* 'tell-1SG.AOR' and to *lo-ma* 'tell-INF'. It seems that the exact definition of what is a vowel or a consonant is actually tweaked from one language to another, with glides /j/ and /w/ being assigned to one class or the other in a way that the stem alternation patterns of Tables 50 and 51 can be preserved and phonological conditioning maintained.

	Intransitive	Transitive			
		1	2SG	2PL	3
1SG	meʔ		meʔ	meʔ	wa
1DU	meʔ		meʔ	meʔ	meʔ
1PL	wa		meʔ	meʔ	wa
2SG	meʔ	meʔ			wa
2DU	meʔ	meʔ			meʔ
2PL	wa	meʔ			wa
3SG	meʔ	meʔ	meʔ	wa	wa
3DU	meʔ	meʔ	meʔ	wa	meʔ
3PL	meʔ	meʔ	meʔ	wa	wa

Table 52
Paradigmatic distribution of non-past allomorphs in Yakkha (Schackow 2016: 232).

suffix *-cucu* were replaced by the suffix *-utu* in Table 51 (e.g. *lem-cucu* > *lem-utu*). That change would require a further change (i.e. *lem-utu* > *lems-utu*) if phonological conditioning of stem alternation were to be preserved in the language. This might make changes like this one less inconspicuous and thus disfavoured compared to other more structure-preserving changes.

It is my contention, thus, that there is after all, in East Kiranti languages, a morphomic paradigmatic pattern that is being acquired and interiorized as part of the grammar despite this being completely redundant in principle. The form of each individual suffix (i.e. /naʔa/, /juk/, etc.) has to be learnt no matter what. The paradigmatic extension of stem alternation can be derived straightforwardly from the form of the suffixes and, as such, the independent acquisition of the paradigmatic patterns in Tables 50 and 51 is entirely superfluous. However, the diachronic changes which are found across East Kiranti require that these patterns be learnt on their own and construed as grammatically relevant.

Particularly striking in this respect is the situation in Yakkha (see Tables 5 and 6, and Schackow 2016: 230–231). In this language, a suffix *-meʔ* has intruded into all and only those non-past cells that have a preconsonantal stem. Conversely, a suffix *-wa* has intruded into all and only those non-past cells that have prevocalic stems across East Kiranti. As Schackow (2016: 230-231) explains, these suffixes (Table 52) go back ultimately to verbs,[14] which grammaticalized into the tense markers we find synchronically. This allomorphic distribution can only be

[14] There is still today in the language a verb *wa-ma* that means ‘sit’, ‘stay’ or ‘live’. The verb *meʔ-ma*, in turn, has cognates in closely related languages (e.g. in Bantawa), where they mean ‘do’ or ‘cause’. Suffixes in other Kiranti languages can also be often traced back to verbs. For example, in Athpariya, *-yuk* (see Table 1 above and Ebert 1997a: 45) is believed to have descended from the verb *yuŋ*, which meant ‘be’ or ‘stay’.

https://doi.org/10.1017/S0022226720000341 Published online by Cambridge University Press

explained if the paradigmatic patterns highlighted in Tables 50 and 51 above are acquired and integrated as part of the synchronic grammar and not if they are simply derived from the phonological shape of the suffixes.

It must remain clear that with this observation I am not denying the synchronic relevance of the phonological context in the paradigmatic distribution of stem alternation in these languages. Automatic phonological adjustment of a single stem root is out of the question in many cases.[15] However, the correlation of phonological environment and stem alternation is quite clearly still relevant synchronically. This is suggested by the fact that the two go hand-in-hand in the sparse cases (e.g. in the 1PL.INCL non-past in Limbu intransitive verbs (Table 7), or in 3PL non-past in Bantawa and Puma transitive verbs (Tables 14 and 16)) where change does happen in the paradigmatic distribution of the alternation.

The traditional interpretation of phenomena like this has been that the change in the suffix somehow triggers or causes the change in the stem. This is because it is frequently assumed that, when a phonological environment and a stem alternant are co-extensive in synchrony, it is the former that is responsible for, or 'conditions', the latter. This is obviously the reason why the phenomenon is referred to as 'phonological conditioning' in the first place.[16] This seems to me to be an entirely unfounded assumption, however, and based on theoretical desiderata (e.g. that stems should not serve as grammatical exponents (see Spencer 2016) or that all morphology is 'really' concatenative (Bye & Svenonius 2012)) rather than on empirical evidence alone. What we observe in Kiranti, for example, is that, in some cases, the irruption of a new suffix into the paradigm (e.g. non-past *-ʔi* in Yamphu, see Table 11), causes the stems to shift (to their preconsonantal form in this particular instance), and in other cases (e.g. the Yakkha non-past discussed in Table 52) it is the stem alternation pattern which provides the motivation (the 'morphological niche' in terms of Lindsay & Aronoff 2013) for the distribution of suffixes.

In either case, the coextensivity of stem alternation and a phonological environment has been actively perpetuated. It appears to be a desirable trait, therefore, which may be the reason why it has been preserved in all these East Kiranti languages even in the face of quite radical morphological and phonological changes. Whether it is the form of suffixes that produces the stem alternation pattern

[15] There is abundant evidence that in some of these languages (probably in all) the alternations are not only adjustments due to phonotactic constraints. In many cases (e.g. Limbu, see Section 2.4 above) stem alternations are not always predictable and the alternants must sometimes be stored in some way in the lexicon. There is little to be gained, in addition, from considering one of the forms (e.g. the longer, pre-vocalic one) as basic and the other as derived. In Yamphu, for example, some verbs have a unique preconsonantal stem but show fluctuation or uncertainty in the form of their prevocalic stem (e.g. *lend/less* ~ *len* 'come', *ren/ress* ~ *ren* 'pierce through'; Rutgers 1998: 107).

[16] This assumption often extends to stem alternations in general. Bickel & Nichols (2007: 186), for example, argue that the present-vs.-past stem-vowel apophonies in German strong verbs are 'triggered' by the person-tense suffixes, which does not seem to follow easily from the data at face value (e.g. PRS *trag-st* 'carry-2SG' vs. PAST *trug-st* 'carry-2SG', 2PL.PRS *trag-t* vs. 2PL.PAST *trug-t*).

https://doi.org/10.1017/S0022226720000341 Published online by Cambridge University Press

or the stem alternation pattern that affects the form of the suffixes, however, is a false dilemma, since influence is, as we have seen, bidirectional. Co-extensivity with a coherent phonological environment, thus, does not detract from the grammatical/morphological status of a pattern of stem alternation. In agreement with Maiden (2017), the evidence of East Kiranti suggests that morphomicity and so-called 'phonological conditioning' are not mutually exclusive. If anything, it seems that, quite on the contrary, occurrence in a coherent phonological environment makes a particular stem alternation pattern more salient and resilient in language change.

Thus, the similarity/identity of the phonologically-conditioned stem alternations in East Kiranti contrasts with the heterogeneous nature of morphological stem alternations in West Kiranti. The only (mildly) recurrent pattern (Table 53) is that of a longer or augmented stem occurring in the third person and the singular forms. This appears in Sunwar (Table 24), Dumi (Table 39), Koi (Table 47) and Jerung (Table 48). Kulung (Table 20) and Wambule (Table 49) show similar patterns. Sometimes, however, it is not entirely clear whether (or which of) these structures are cognate, since they differ very substantially in their details (e.g. the tense where they appear and the forms that instantiate them). Even clearly cognate patterns in West Kiranti like those of closely related Jerung (Table 48) and Wambule (Table 49) have been found to differ in their paradigmatic extension, which means that change has happened in relatively short timescales.

There is also another pattern which, the same as the previous one, appears with small differences in a number of West Kiranti languages. This involves the nasalization of stem-final stops. In Bahing, it has the paradigmatic extension highlighted in Table 54. In Wayu (Table 32), by contrast, the nasal stem occurs

	SG	DU	PL
1EXCL	gɔk-ma	go-cum	go-kum
1INCL		go-cim	go-kim
2	gɔk-nim	go-cim	go-nimme
3	gɔkt-im	gɔk-cim	gɔk-me

Table 53
Paradigm of Jerung 'give' (*gɔkt- go-*) (Opgenort 2005: 330).

	SG	DU	PL
1EXCL	boŋ-ŋa	bok-su	bok-ka
1INCL		bok-sa	boŋ-ja
2	boŋ-e	bok-si	boŋ-ni
3	boŋ	bok-se	boŋ-me

Table 54
Paradigm of Bahing 'rise' (*bok- boŋ-*) non-past, intransitive (Michailovsky 1975: 189).

https://doi.org/10.1017/S0022226720000341 Published online by Cambridge University Press

in the past, and only in the 2/3SG and 2/3PL. In Khaling (Table 33 and Table 36), various alternations involve nasal-final stems alternating with stops. They can be found, in both past and non-past, in various cells of the singular and the plural but never with the same distribution as in the other languages. In Thulung (Table 43), the nasal stem appears, mostly in the present, with a seemingly erratic distribution which paradoxically involves all the dual cells. Dumi, for all its complexity, does not appear to make use of stem-nasalization at all. The only possible conclusion, I believe, is that, unlike in East Kiranti, there do not seem to exist many generalizations available concerning stem alternations in West Kiranti.

The diversity of paradigmatic stem alternation patterns in West Kiranti is, thus, significantly greater than in East Kiranti languages. Even the lowest-level subgroups in West Kiranti (i.e. Koi/Thulung, Khaling/Dumi, Sunwar/Bahing/Wayu and Jerung/Wambule, see Figure 2) show internal diversity comparable to (and usually greater than) East Kiranti as a whole. Particularly relevant is the comparison of Sunwar and Bahing (Tables 26 and 29), and of Jerung and Wambule (Tables 48 and 49). These languages appear to be among the closest, genetically, in the whole of Kiranti (93% lexical similarity according to Opgenort 2005)[17] and yet their cognate paradigms still show differences in the distribution of the stem alternants. The antiquity and progression of the branching of both subfamilies is currently very uncertain. However, based on our current state of knowledge and on the similarities and differences in the forms of inflectional suffixes, there is no reason to believe that this difference in the diversity of stem alternations is solely due to the greater antiquity of (the branching of) West Kiranti. The greater internal variation within West Kiranti alternation patterns, thus, would need additional explanation.

I contend here that the absence of a phonologically coherent environment around West Kiranti stem alternations may be the factor that has made the patterns comparatively more vulnerable to paradigmatic modification (i.e. analogy), or to disruption by other forms and sound changes. This may also explain similar developments in more well-studied language families like Romance. There we find, in languages like Spanish, Portuguese or Italian, that the morphomic patterns of stem alternation in verbs are quite stable, and distributionally largely unchanged from the ancestral language. Also in these languages, the phonological environments that originally created the alternations (stress, and a front- vs. back-vowel suffix) remain in place and with an identical paradigmatic distribution as the stem alternations themselves. In French, however, where these phonological environments have disappeared, the inherited alternations have disintegrated or have changed beyond recognition (see Esher 2017). Although cases can be found where the original conditioning environment and the stem alternation pattern have become dissociated (e.g. Benasque Aragonese, Saura Rami 2003), it is more common for them to lead parallel lives, even when they change their paradigmatic distribution (see e.g. Surmiran, Anderson 2008).

[17] Opgenort has calculated lexical distances for a sample of Kiranti languages. The measures (accessed May 2019) can be found at http://www.opgenort.nl/kiranti_database_project.

https://doi.org/10.1017/S0022226720000341 Published online by Cambridge University Press

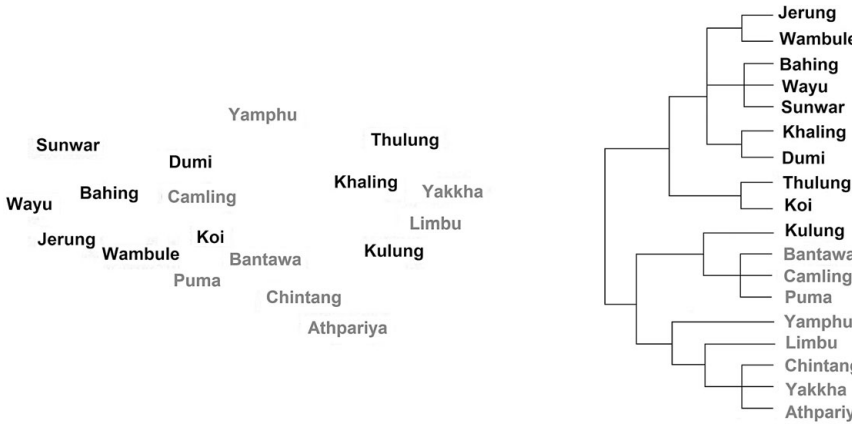

Figure 3
Areal (left) and genealogical (right) distribution of phonologically-conditioned (grey) and unconditioned (black) stem alternations in Kiranti.

6. Conclusion

This paper has presented an overview of (consonantal) stem alternations in Kiranti verbal inflection. The broadest finding to emerge from it is the existence of a split in the family between those stem alternation systems that correlate with a coherent phonological environment (i.e. with consonant- vs. vowel-initial suffixes) and those that do not.

This broad divide is seen in Figure 3 to correspond very closely to the genetic subdivisions within the family (phonological conditioning in East Kiranti vs. lack thereof in West Kiranti) and much less so to geographic or areal divisions (contra Ebert 2003). This is thus an important trait to consider in the field of Kiranti (and/or Trans-Himalayan phylogeny (see e.g. Gerber & Grollmann 2018).

Besides this one, the most interesting observation is that, in those languages where stem selection can be described in terms of phonological conditioning, the paradigmatic extension of the alternation patterns is virtually identical. A prevocalic form of the stem is found in intransitive verbs across East Kiranti, in the 1PL and 2PL of the non-past and in all cells of the past. In transitive verbs (with 3SG patient), that stem is found in the SG and PL forms of the non-past and throughout the past.

The few deviations that can be found from this family-wide pattern show us that the correlation between stem selection and the form of the suffixes continues to be synchronically relevant. However, the remarkable stability of the patterns (even in the presence of extensive affixal changes), as well as some of the diachronic developments (most notably that of Yakkha *-me(ʔ)* vs. *-wa*) suggest that these stem alternation patterns constitute a (morphomic) grammatical entity of their own. That is, despite stem selection being straightforwardly derivable in these languages from the forms of suffixes, stem alternation patterns are able, in turn, to have a say in

https://doi.org/10.1017/S0022226720000341 Published online by Cambridge University Press

the form of suffixes. Thus, phonological environment and stem alternation appear to 'team up' to make the patterns more salient and diachronically resilient in East Kiranti. By contrast, in West Kiranti, where stem alternation patterns cannot be associated with any phonological environment, the paradigmatic distribution of stem alternations is much more diverse synchronically, which suggests that the patterns are less resilient diachronically.

These findings have implications for our assumptions concerning morphomes in particular and morphology in general. Concerning the latter, it suggests that (some) cases of so-called 'phonological conditioning' should not be understood as one-directional determinations of the form of one exponent (the stem) by the other (the suffix). In Paradigm Function Morphology (PFM; Stump 2001), for example, a stem alternation that correlates with different phonological environments would be formalized by means of a rule (called a 'morphological metageneralization' by Stump 2001: 189) that refers back to the suffixes. Because the rules have to be ordered and because the lexicon should be free of redundancies, the East Kiranti data are problematic for PFM and for constructive approaches to morphology more generally.

These issues would not even arise, of course, in morphological models that do not rely on segmentation at all. In abstractive models, for example, the basic unit of analysis is the word. While derivation is the key notion in constructive approaches, predictability is the backbone of abstractive ones (Blevins 2006: 537). Because of the focus on whole words, predictability has been explored in these models almost exclusively in paradigmatic terms (i.e. predictability of one whole word form or paradigm cell on the basis of another). While it must also play a role in East Kiranti,[18] this type of predictability seems to be much less important here than in more morphologically irregular languages.

Another (much less researched) domain of predictability appears to play a bigger role in East Kiranti languages. As explained throughout this paper, at the syntagmatic level, the C- versus V-initial nature of the suffix is a perfect predictor of the form of the stem. The same thing can be stated, however, 'from left to right': in alternating stems, the form of the stem is a perfect predictor of the C/Ø vs. V form of the following suffix. This might seem a relatively unhelpful predictability intuitively, but has been seemingly reinforced and made less abstract in Yakkha, as stem alternants no longer predict only the phonotactic shape of the suffixes there but also their concrete segmental form. Because of the time-dependent nature of human language, syntagmatic predictability must be more relevant (e.g. for processing) 'from left to right' (i.e. from stem to suffix) that 'from right to left', as only what has been already heard/seen can logically be used to make inferences of any kind about

[18] Because these languages have very big and concatenative paradigms, and lack inflection classes and unpredictable stem alternations, one could think of East Kiranti as having an inflectional system ideal for constructive approaches to morphology. Even though a great descriptive economy would be achieved by understanding these systems in terms of segmentable suffixes plus stem selection, this does not appear to be the (only) way in which language users interpret East Kiranti inflection.

https://doi.org/10.1017/S0022226720000341 Published online by Cambridge University Press

what is still to come. This obvious fact has been hypothesized (see Diessel 2019: 78) to be the source of the suffixing preference in languages, and might also explain the tendency, observed in East Kiranti to preserve and even reinforce stem-to-suffix predictive relations.

Apart from these implications for theoretical morphological models, the East Kiranti facts also illustrate how the domains of phonology and morphology overlap often in non-trivial ways so that phonologically-derivable patterns do not necessarily fall outside the domain of morphology nor stay always paradigmatically underlearned (see Morin 1988).[19] Concerning morphomes more particularly, the evidence from Kiranti suggests that the synchronic correlation (and, furthermore, the synchronic dependency) of a pattern of stem alternation and a particular phonological environment does not detract from the status of stem alternation as a self-standing morphological/morphomic phenomenon in the language.

The most usual definitions of what a morphome is (e.g. O'Neill 2013: 228–229; Maiden 2018: 24)[20] and also the disagreements on whether some stem alternation pattern should be considered morphomic or not (e.g. Anderson 2011 vs. Maiden 2011) have often revolved around the independence of that pattern from concrete phonological environments. The evidence from Kiranti suggests that, maybe surprisingly, some of the most typical quasi-definitional[21] characteristics of morphomes such as diachronic resilience, productivity, and psychological reality seem to be enhanced, rather than diminished, in situations of phonological conditioning.

Although consistent with some of the literature (e.g. Esher 2017), these findings contradict some frequently held assumptions about morphomes. On the basis of what he observes in Romance, Maiden (2018: 6), argues that 'morphomic distributions emerge as seemingly no less highly valued than those that appear to have phonological or semantic conditioning'. This is at odds with the Kiranti facts that have been presented here, where morphology-only stem alternation patterns (West Kiranti) appear to be less stable (and thus probably less productive and less psychologically real – recall footnote 14 above) than phonologically-conditioned stem alternations (East Kiranti).

---

[19] Morin (1988) provides evidence that language users sometimes do acquire phonologically derivable patterns redundantly. Thus, in Vinzelles Occitan, an apparently stress-determined (allomorphic) stem alternation (e.g. 'love' 1SG.PRS.IND ˈ*amə* vs. 2SG.PRS.IND *ɐˈma:*) was apparently not analyzed as such by language users since, when they analogically leveled stressed within the present tense, the allomorphy was preserved (i.e. 1SG.PRS.IND ˈ*amə* vs. 2SG.PRS.IND ˈ*ɐma:*).

[20] '[T]he essential but not sufficient condition for any phenomenon to be described as morphomic is that it should be defined over a paradigmatic domain that is irreducible to any one semantic, functional, or PHONOLOGICAL denominator' (Maiden 2018: 24, emphasis mine).

[21] The quotation in footnote 13 above leaves it clear that there must be (an)other requirement(s) in morphome identification besides lack of semantic and phonological motivation. Although this is not always discussed, one infers that some psychological reality is also required. This would be revealed by a pattern's productivity (i.e. by its analogical applicability to new forms, as in Yakkha, for example, or its active defense against disruptive developments). Naturally, productivity translates into greater diachronic resilience.

https://doi.org/10.1017/S0022226720000341 Published online by Cambridge University Press

On the basis of these Kiranti facts, the inevitable conclusion is that the properties of diachronic resilience, productivity, and psychological reality[22] are enhanced when phonology and morphology agree upon the same pattern. This stands to reason. Because these stem alternations will be able to rely on this extra cue or niche (Aronoff 2016), this should translate into more robust, more predictable, more learnable, and more stable patterns. As argued by Enger (2014), 'two cues may be better than one' (see also Herce 2020b). Future research should be aimed at assessing whether (and/or how much) a morphological pattern's coextensiveness with a coherent semantic or functional value also favours its learnability, stability and survival.

REFERENCES

Allen, Nicholas Justin. 1975. *Sketch of Thulung grammar: With three texts and a glossary*. Ithaca, NY: China–Japan Program, Cornell University.

Anderson, Stephen R. 2008. Phonologically conditioned allomorphy in the morphology of Surmiran (Rumantsch). *Word Structure* 1.2, 109–134.

Anderson, Stephen R. 2011. Stress-conditioned allomorphy in Surmiran (Rumantsch). In Maria Goldbach, Marc-Olivier Hinzelin, Martin Maiden & John Charles Smith (eds), *Morphological autonomy: Perspectives from Romance inflectional morphology*, 13–35. Oxford: Oxford University Press

Aronoff, Mark. 1994. *Morphology by itself: Stems and inflectional classes*. Cambridge, MA: MIT Press.

Aronoff, Mark. 2016. Competition and the lexicon. In Claudio Iacobini, Annibale Elia & Miriam Voghera (eds.), *Livelli di analisi e fenomeni di interfaccia. Atti del XLVII congresso internazionale della Società di Linguistica Italiana* [Levels of anlisis and interface phenomena: Proceedings of the XLVII International Congress of the Linguistic Society of Italy], 39–52. Roma: Bulzoni.

Baerman, Matthew & Greville G. Corbett. 2012. Stem alternations and multiple exponence. *Word Structure* 5.1, 52–68.

Bickel, Balthasar & Martin Gaenszle. 2015. First person objects, antipassives, and the political history of the Southern Kirant. *Journal of South Asian Languages and Linguistics* 2, 63–86.

Bickel, Balthasar & Johanna Nichols. 2007. Inflectional morphology. In Timothy Shopen (ed.), *Language typology and syntactic description*, vol. 3.2, 169–240. Cambridge: Cambridge University Press.

Blevins, James P. 2006. Word-based morphology. *Journal of Linguistics* 42.3, 531–573.

Borchers, Dörte. 2008. *A grammar of Sunwar: Descriptive grammar, paradigms, texts and glossary*. Leiden: Brill.

Bye, Patrik & Peter Svenonius. 2012. Non-concatenative morphology as epiphenomenon. In Jochen Trommer (ed.), *The morphology and phonology of exponence*, 427–495. Oxford: Oxford University Press.

Diessel, Holger. 2019. *The grammar network*. Cambridge: Cambridge University Press

Doornenbal, Marius. 2009. *A grammar of Bantawa*. Ph.D. dissertation, Leiden University.

Ebert, Karen H. 1997a. *A grammar of Athpare*. Munich: Lincom Europa.

Ebert, Karen H. 1997b. *Camling:(Chamling)*. Munich: Lincom Europa.

Ebert, Karen. 2003. Kiranti languages: An overview. In Graham Thurgood & Randy J. LaPolla (eds.), *The Sino-Tibetan languages*, 505–517. London: Psychology Press.

Enger, Hans-Olav. 2014. Reinforcement in inflection classes: Two cues may be better than one. *Word Structure* 7.2, 153–181.

Esher, Louise. 2017. Morphome death and transfiguration in the history of French. *Journal of Linguistics* 53.1, 51–84.

Gerber, Pascal & Selin Grollmann. 2018. What is Kiranti? A critical account. *Bulletin of Chinese Linguistics* 11.1–2, 99–152.

[22] These properties cannot be exclusive of unnatural morphological patterns of course, but should apply to any linguistic category (e.g. morphemic or syntactic) that is not just 'made up' by linguists.

Hammarström, Harald, Robert Forkel & Martin Haspelmath. 2017. *Glottolog 3.0.* Jena: Max Planck Institute for the Science of Human History. Available at http://glottolog.org, accessed 10 May 2019.
Herce, Borja. 2020a. On morphemes and morphomes: Exploring the distinction. *Word Structure* 13.1, 45–68.
Herce, Borja. 2020b. Alignment of forms in Spanish verbal inflection: The gang poner, tener, venir, salir, valer as a window into the nature of paradigmatic analogy and predictability. *Morphology* 30, 91–115.
Hodgson, Brian H. 1858. Analysis of the Bahing dialect of the Kiránti language. *Journal of the Asiatic Society of Bengal* 26, 486–522.
Jacques, Guillaume. 2012. Agreement morphology: The case of Rgyalrongic and Kiranti. *Language and Linguistics* 13.1, 83–116.
Jacques, Guillaume. 2017. A reconstruction of Proto-Kiranti verb roots. *Folia Linguistica* 51, 177–215.
Jacques, Guillaume, Aimee Lahaussois, Boyd Michailovsky & Dhan Bahadur Rai. 2011. An overview of Khaling verbal morphology. *Language and Linguistics* 13.6, 1095–1170.
Lahaussois, Aimée. 2002. *Aspects of the grammar of Thulung Rai: An endangered Himalayan language*. Ph.D. dissertation, University of California Berkeley.
Lahaussois, Aimée. 2009. Koyi Rai: An initial grammatical sketch. *Himalayan Linguistics Archive* 4, 1–33.
Lahaussois, Aimée. 2011. The Thulung Rai verbal system: An account of verb stem alternation. *Cahiers de Linguistique Asie Orientale* 40.2, 189–224.
Lindsay, Mark & Mark Aronoff. 2013. Natural selection in self-organizing morphological systems. In Nabil Hathout, Fabio Montermini & Jesse Tseng (eds.), *Morphology in Toulouse: Selected proceedings of Décembrettes 7* (LINCOM Studies in Theoretical Linguistics 51), 133–153. Munich: Lincom Europa.
Maiden, Martin. 1992. Irregularity as a determinant of morphological change. *Journal of Linguistics* 28.2, 285–312.
Maiden, Martin. 2005. Morphological autonomy and diachrony. *Yearbook of morphology 2004*, 137–175. New York: Springer.
Maiden, Martin. 2011. Morphomes and 'stress-conditioned allomorphy' in Romansh. In Maria Goldbach, Marc-Olivier Hinzelin, Martin Maiden & John Charles Smith (eds.), *Morphological autonomy: Perspectives from Romance inflectional morphology*, 36–50. Oxford: Oxford University Press.
Maiden, Martin. 2017. Romansh allomorphy (Again!). In Claire Bowern, Laurence Horn & Raffaella Zanuttini (eds.), *On looking into words (and beyond): Structures, relations, analyses*, 189–210. Berlin: Language Science Press.
Maiden, Martin. 2018. *The Romance verb: Morphomic structure and diachrony*. Oxford: Oxford University Press.
Michailovsky, Boyd. 1975. Notes on the Kiranti verb (East Nepal). *Linguistics of the Tibeto-Burman Area* 2.2, 183–218.
Michailovsky, Boyd. 1985. Tibeto-Burman dental suffixes: Evidence from Limbu (Nepal). *Linguistics of the Sino-Tibetan Area: The State of the Art. Papers presented to Paul K. Benedict for his 71st birthday*, 363–375. Canberra: Department of Linguistics, Research School of Pacific Studies, The Australian National University.
Michailovsky, Boyd. 1988. *La langue hayu* [The Hayu language]. Paris: CNRS.
Morin, Yves-Charles. 1988. Morphological conditioning in phonologically transparent processes: Evidence from the evolution of vowel reduction in Vinzelles Occitan. *Canadian Journal of Linguistics/Revue canadienne de linguistique* 33.4, 431–442.
Nevins, Andrew. 2011. Phonologically conditioned allomorph selection. In Marc van Oostendorp, Colin J. Ewen, Elizabeth Hume & Keren Rice (eds.), *The Blackwell companion to phonology*, 1–26. Malden, MA: Wiley-Blackwell.
O'Neill, Paul. 2011. *The Ibero-Romance verb: Allomorphy and the notion of the morphome*. Ph.D. dissertation, Oxford University.
O'Neill, Paul. 2013. The morphome and morphosyntactic/semantic features. In Silvio Cruschina, Martin Maiden & John Charles Smith (eds.), *The boundaries of pure morphology*, 221–246. Oxford: Oxford University Press.
Opgenort, Jean Robert. 2004. *A grammar of Wambule: Grammar, lexicon, texts, and cultural survey of a Kiranti tribe of eastern Nepal*. Leiden: Brill.
Opgenort, Jean Robert. 2005. *A grammar of Jero: With a historical comparative study of the Kiranti languages*. Leiden: Brill.
Paudyal, Netra Prasad. 2013. *Aspects of Chintang syntax*. Ph.D. dissertation, University of Zurich.

Rutgers, Roland. 1998. *Yamphu: Grammar, texts & lexicon*. Leiden: CNWS.
Saura Rami, José Antonio. 2003. *Elementos de fonética y morfosintaxis benasquesas* [Phonetic and morphosyntactic notes on Benasque Aragonese]. Zaragoza: Gara d'Edizions-Institución Fernando el Católico.
Schackow, Diana. 2016. *A grammar of Yakkha*. Berlin: Language Science Press.
Sharma, Narayan Prasad. 2014. *Morphosyntax of Puma, a Tibeto-Burman language of Nepal*. Ph.D. dissertation, SOAS University of London.
Spencer, Andrew. 2016. Stems, the morphome and meaning-bearing inflection. Ana R. Luís & Ricardo Bermúdez-Otero (eds.), *The morphome debate*. Oxford: Oxford University Press.
Stump, Gregory T. 2001. *Inflectional morphology: A theory of paradigm structure*. Cambridge: Cambridge University Press.
Tolsma, Gerard Jacobus. 1997. The verbal morphology of Kulung. *Tibeto-Burman languages of the Himalayas 14*, 103–117. Canberra: Australian National University.
Tolsma, Gerard Jacobus. 1999. *A grammar of Kulung*. Ph.D. dissertation, Leiden University.
van Driem, George. 1993. *A grammar of Dumi*. Berlin: de Gruyter.
van Driem, George. 2011. *A grammar of Limbu*. Berlin: de Gruyter.
Watters, David E. 2002. *A grammar of Kham*. Cambridge: Cambridge University Press.
Witzlack-Makarevich, Alena, Taras Zakharko, Lennart Bierkandt, Fernando Zúñiga & Balthasar Bickel. 2016. Decomposing hierarchical alignment: Co-arguments as conditions on alignment and the limits of referential hierarchies as explanations in verb agreement. *Linguistics* 54.3, 531–561.

Author's address: *University of Zurich, Plattenstrasse 54, 8032 Zürich, Switzerland*
borjaherce@gmail.com

https://doi.org/10.1017/S0022226720000341 Published online by Cambridge University Press