

What is a word in Brokpa?

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This paper investigates the structure of phonological word and grammatical word in Brokpa, a Tibeto-Burman (Trans-Himalayan) language of Bhutan. Defining features of a phonological word include stress, tone, and segmental properties. A grammatical word is defined based on conventionalized coherence and meaning, fixed order of morphemes, and its behaviour in relation to derivational and inflectional marking. Grammatical and phonological words in Brokpa coincide in most instances. Typical mismatches include words involving non-cohering compounds and non-cohering reduplication. A formal distinction between phonological and grammatical word is the key to our understanding of the interactions between different parts of grammar in Brokpa, and help resolve potential ambiguities of the term “word” in this language.

Keywords: affixation, cohering compound, cohering reduplication, enclitic, grammatical word, non-cohering compound, non-cohering reduplication, phonological word, root, stem

1. Introduction

Recognizing the unit “word” in a language is by no means straightforward. A hierarchy of phonological units suggested by Dixon (2010: 27) and repeated in Aikhenvald et al. (2020) is: phoneme, syllable, foot (in some languages), phonological word, intonation group, utterance. The units higher than phonological word in the prosodic hierarchy suggested by Nespor and Vogel (1986, 2007) are phonological phrase, intonational phrase, and phonological utterance. A hierarchy of grammatical units suggested by Dixon (2010: 27) and repeated in Aikhenvald et al. (2020) is: morpheme, grammatical word, phrase, clause, sentence.

At a cursory glance, one might be led to believe that the unit “phonological word” is directly parallel with “grammatical word”, since each of these two units is immediately below the phrase-level unit in their respective hierarchies. However, as this paper will illustrate, while a phonological word does correspond

to a grammatical word, the notion of exact parallelism between these two units in a language such as Brokpa seems more or less superficial. Examining the features that characterize every unit in the phonological hierarchy of Brokpa and establishing a relationship with their corresponding units in its grammatical hierarchy will be beyond the scope of this paper.

In this paper, we examine the different facets of “word” in Brokpa, a Tibeto-Burman (Trans-Himalayan) language, spoken by a few thousand people in Bhutan and Northeast India. Our focus is on the distinction between phonological word and grammatical word based on the language-internal features of Brokpa. We first investigate the phonological principles for determining phonological words in § 2, morpho-syntactic principles for determining grammatical words in § 3, and then compare the two types of word in §§ 4–5. The paper ends with a brief conclusion in § 6.

The tradition of systematically distinguishing “phonological word” and “grammatical word” was initiated by Dixon in his grammar of Yidij (Dixon 1977: 88–98) and Boumaa Fijian (Dixon 1988: 24–31). In-depth discussions of phonological words and grammatical words and the history of the recognition of these concepts are provided, *inter alia*, in Dixon and Aikhenvald (2002) and Dixon (2010: 1–36), and, more recently, Aikhenvald et al. (2020) and references there. Further sources on word include Bickel, Schiering and Hildebrandt (2009), Selkirk (1995), Hall, Hildebrandt, and Bickel (2008), Hall and Kleinhenz (1999), Hildebrandt (2015), Nespov and Vogel (1986, 2007), Peperkamp (1997) and Schiering, Bickel, and Hildebrandt (2010).

The issue of the correlation between the phonological and the grammatical word has been the focus of numerous publications on Tibeto-Burman languages. Publications on this subject in Tibeto-Burman languages include Belhare (Bickel 1998), Chintang (Bickel & Zúñiga 2017), Dzongkha (Mazaudon & Michailovsky 1988; van Driem 1991; Watters 2002, 2018), Khyirong Tibetan (Hall & Hildebrandt 2008), Lepcha and Balti Tibetan (Sprigg 1966; Caplow 2016), Limbu (Hildebrandt 2007), Manange (Hildebrandt 2004), mBrugchu Tibetan (Suzuki 2015), Tamang (Mazaudon 1973), and Tibetan (Hill 2010, 2012; Sprigg 1955; Watters 2002).

2. Phonological word

In order to examine the criteria for phonological word in Brokpa, it is important to understand the basic syllable structure of this language. The syllable canon in Brokpa can be postulated as C1(C2)V(C3)(C4), where C indicates a consonant or a glide and V can be a short vowel, a long vowel or a diphthong. The division of segments into syllables are as follows: any of the thirty-nine consonants, provided in Appendix A, can fill the C1 slot; only liquids – /r/, /l/, /w/, and /y/ – may fill the C2

slot. The glides /w/ and /y/, as phonemes, are more restricted to syllable-initial position and their occurrence in the C2 slot (consonant plus glide cluster word-initially) is very infrequent, found only in some speakers. The C3 slot may be filled by any of the following: voiceless, both unaspirated and aspirated, stops /p/, /p^h/, /t/, /t^h/, /k/, /k^h/; nasals /m/, /n/, /ŋ/; apico-alveolar fricatives /s/ and /z/; two voiced liquids /r/ and /l/; and glottal stop /ʔ/. Only two, the voiceless apico-alveolar fricative /s/ and the voiceless lamino-palatal fricative /ç/, occupy the C4 slot. (See Wangdi 2020 for syllable-related phenomena in Brokpa).

A phonological word typically constitutes the domain for the application of phonological rules (Dixon & Aikhenvald 2002; Dixon 2010: 7; see also Aikhenvald et al. 2020 and references there). A phonological word is a minimally pronounceable unit, and thus has a psychological reality for the speaker. Speakers may dictate materials, following divisions into phonological words as pronounceable units, as in Fijian (Dixon 2020: 33–37). A phonological word in Brokpa can be recognized on the basis of one or more of the following criteria: stress, phonotactic restrictions, diphthong position, vowel harmony, and principles of resyllabification. A phonological word may be preceded and followed by a short pause. The placement of a pause itself functions as a separate criterion for recognizing a phonological word in Brokpa as in many other languages (see, among others, Bloomfield 1933: 180, Dixon 2010: 7, and Lyons 1968: 202).

2.1 Stress and tone

Major evidence for phonological words in Brokpa comes from the prosody of stress. Stress is not lexically contrastive in this language, but it serves as a criterion for phonological words and functions as, in Trubetzkoy's (1969: 77) words, a “non-phonemic word boundary signal” (see Wangdi 2020 for a detailed discussion on stress, tone and their interaction with syllable structure and phonological words in Brokpa). In this paper, we begin with a premise that a prosodic unit must have a primary stress in order for it to constitute a phonological word. The primary stress is shown by the diacritic [ˈ] and the secondary stress by [ˌ] in the phonetic representations. High (register) tone in lexemes with sonorant initial is shown by (ː). Low register tone is left unmarked. The primary stress is generally on the first syllable, e.g. *zarbu* [ˈzər.bu] ‘steep’, *k^hyeKrom* [ˈk^hjek.rom] ‘glacier’. There is one exception: If the first syllable in a disyllabic word is light (CV) and the second syllable heavy (CVC, CVː, CVV), then the second syllable is stressed, e.g. *pumoj*¹ [pʊ.ˈmõː] ‘shoulder’.

1. In the Sakteng accent, this word is pronounced *pumjo* [ˈpʊŋ.mo] and the stress is on the first syllable.

The secondary stress falls on the final syllable of a trisyllabic word, e.g. *qamaru* [ˈdʱe.mɛ.ɾu] ‘small drum’, *yáŋkume* [ˈjəŋ.ku.mɛ] ‘cow’, *sekpeliŋ* [ˈsek.pɛ.ɿŋ] ‘(fish) scale’. In a quadrisyllabic word, the secondary stress falls on the penultimate syllable, e.g. *d^hikparaza* [ˈd^hik.pɛ.ɾɛ.zɛ] ‘scorpion’, *kamarupa* [ˈkɛ.mɛ.ɾu.pɛ] ‘marble’. A disyllabic word has no secondary stress. Note that monomorphemic quadrisyllabic words are very rare. There are no monomorphemic words longer than four syllables in my corpus. An ideal length of a phonological word in Brokpa, whether monomorphemic or after inflections, is up to four syllables.

In summary, the primary stress and the secondary stress help to ascertain the exact boundary of a word. We can deduce the beginning of a phonological word from the location of a primary stress. The location of a secondary stress also provides a clue about the end of a phonological word (Table 1).

Similar to primary stress, high tone serves as a clue for the beginning of a phonological word. Tone is lexically contrastive in words with sonorant initial. Typically, words with high tone are monosyllabic and they can easily be heard in connected speech, as in (1a). If a word consisting of two or more syllables receives a high tone, it is usually the first syllable, as in (1b):

- (1) a. te num=zi? **ŋúi**=næ...
 PART night=INDF cry=ABL.SEQ
 ‘By crying the whole night’
 b. da lópon=la guzap **p^hu**:
 PART teacher=DAT respect offer:HON:IMP
 ‘Give respect to the teacher’

The syllable with a high register tone, shown in bold type in (1a) and (1b) provides a signal for the beginning of a phonological word, formed by a lexical root plus a case enclitic.

In Brokpa, pitch register (register tone) is lexically contrastive in monosyllabic lexemes that begin with sonorants. Register tone is not lexically contrastive for obstruent-initial syllables. Monosyllabic lexemes beginning with laterals, nasals, and glides make high versus low register tone contrast: *ló* ‘lung’ versus *lo* ‘age’; *ŋá* ‘five’ versus *ŋa* ‘1:SG’; *yár* ‘to borrow’ versus *yar* ‘to run’. The register tone contrast is also true for sonorant-initial lexemes with stop-final syllables, e.g. *núp* ‘west’ versus *nup* ‘to set’, *lók* ‘to recite’ versus *lok* ‘to return’. Rhotics have voicing contrast but no register tone contrast, e.g. *ɾaŋ* ‘to swell’ versus *raŋ* ‘self’.

2.2 Phonotactic restrictions

In Brokpa, certain consonant phonemes occur only in the coda or in the onset position and may signal the phonological word boundaries. A phoneme that carries out this function may be said to possess double values, that is the value of boundary signals and the value of its phonemic distinctiveness, along the lines of Trubetzkoy (1969: 275).

One phoneme that marks the phonological word boundaries is the glottal stop, similar to a number of other languages (Dixon & Aikhenvald 2002).² The glottal stop is an independent phoneme in Brokpa. All words which otherwise could be analyzed as vowel-initial words commence with a glottal stop, e.g. *ʔoti* ‘DEM’, *ʔadzəŋ* ‘uncle’, *ʔa:* ‘INTJ’, and *ʔi* ‘POLAR.Q’. The glottal stop /ʔ/ contrasts with voiceless glottal fricative /h/, *ʔam* ‘mother/lady’ vs *ham* ‘to feel shock’ and with voiced glottal fricative /ɦ/, *ʔur* ‘to anoint’ vs *ɦur* ‘to be haughty’, word-initially. The glottal stop also contrasts with both vowel /a/ and dorso-velar /k/ in the word-final positions: *tɛ^hak* ‘to land’, *tɛ^haʔ* ‘hand:HON’, *tɛ^ha* ‘pair’.

The glottal stop marks the beginning of a phonological word, as shown in bold in (2):

- (2) **ŋe**=raŋ=gi **ʔou**=la náma=di mo láŋ-na d̥ik-ro
 1:PL=EMPH=GEN boy=DAT wife=DEF 3:SG.F beg-COND be.OK-FINAL
 ‘It will be OK if we take her as the bride for our son’

There are no instances of hiatus in Brokpa. As noted above, the words which may appear as vowel initial in some languages actually commence with a glottal stop in Brokpa. As the syllable structure indicates, no two vowels occur next to each other in adjacent syllables without a consonant in between, e.g. *mo=i ʔou* (3:SG.F=GEN younger.brother) ‘her younger brother’. Further, a potential hiatus within a syllable is resolved by a diphthong formation as the phonological word *mo=i* ‘her’ indicates. In this word, the two adjacent vowels, /o/ and /i/, combine and operate within the rhyme of the single syllable and is pronounced as a monosyllable [mɔi] and not as a disyllable [mo.i].

A further clue for phonological word boundaries is provided by the breathy stops. A breathy stop typically occurs in the word-initial position, as in:

- (3) b^ha-ruʔ
 [b^ha.rʊʔ]
 COW-DIM
 ‘calf’

2. The glottal stop, due to its voiceless phonation, belongs to the group of consonants that have an inherent high pitch register and it engenders high pitch on the following vowel.

- (4) d^hans+me-ti
[d^həns.'me.ti]
memory+NEG.EXIST-NMLZ
'unconscious'
- (5) d^honbu+d^ho-sa
[d^hon.bu.'d^ho.sə]
guest+stay-NMLZ:LOC
'living room'
- (6) g^ho+tcək
[g^ho:.'tɕək]
door+iron
'doorknob'

For example, in (5), the compound *d^honbu+d^ho-sa* meaning 'living room' comprises two phonological words – *d^honbu* 'guest' and *d^ho-sa* 'living place'. We can tell that the second stem *d^ho-sa* is a separate phonological word based on the occurrence of the apico-alveolar breathy-voiced stop /d^h/ within the compound, since breathy stops only occur at the beginning of a word. Therefore, a breathy stop can be interpreted as a phonemic signal for the beginning of a phonological word in Brokpa.

In the same vein, the voiced glottal fricative /ɦ/ typically occurs at the beginning of a phonological word, as in:

- (7) ɦoʔ+t^hoʔ
[ɦoʔ.'t^hoʔ]
below-storey
'basement'
- (8) sa=yi+ɦoʔ
[sə.ji.'ɦoʔ]
land=GEN+below
'underground'

In (8), *sa=yi+ɦoʔ* is a non-cohering compound consisting of two phonological words joined by the genitive marker. The commencement of the second phonological word within the compound can be understood from the voiced glottal fricative.

Further, voiceless liquids signal phonological word boundaries. The apico-alveolar voiceless lateral /l̥/ and the apico-alveolar voiceless rhotic /r̥/ occur only at the beginning of a phonological word. Consider:

- (9) l̥anba+gya
[l̥ən.bə.'gje]
patch+do
'to patch'

- (10) paŋlep+ɾamu
 [ˈpəŋ.lep.ɾə.mu]
 plank+thin
 ‘plywood’

The lexeme *lanba+gya* in (9), a complex predicate formed by incorporating the noun *lanba* ‘patch’ to the light verb *gya* ‘to do’, has two phonological words. The initial phoneme /l/ marks the beginning of the first phonological word, and the /g/ + /y/ sequence (see § 2.4) marks the beginning of the second phonological word in this lexical compound. Similarly, in (10), the voiceless rhotic /ɾ/ marks the beginning of the second phonological word in *paŋlep+ɾamu*, in addition to the primary stress on its first syllable.

Along similar lines, the lamino-prepalatal /ɲ/ occurs at the beginning of a phonological word, e.g. *rui+ɲúgu* [ˈrui.ɲú.gu] (bone:gen+needle) ‘bone needle’. The second phonological word commences with the phoneme /ɲ/. Similarly, the voiced apico-alveolar affricate /dz/ occurs more commonly in the initial position of a phonological word, as in:

- (11) dzægyur
 [ˈdzɛ:.gjʊɾ]
 substance
 ‘substance’
- (12) tɕ^hu+dzom-sa
 [ˈtɕ^hu.ˈdzom.sɛ]
 water+meet-NMLZ:LOC
 ‘estuary’

The compound word *tɕ^hu+dzom-sa* in (12) includes two phonological words. The second phonological word begins with the phoneme /dz/. Although the phoneme /dz/ occurs in the word-medial position, there is a strong tendency for the intervocalic /dz/ to be pronounced [z], e.g. *dakdzin* → [dɛ.ˈzɪn] ‘custody’, *ɲodzin* → [ɲo.ˈzɪn] ‘recognition’. As a result, we can treat the phoneme /dz/ as an indication of the beginning of a phonological word.

2.3 Diphthong position

Brokpa has several diphthongs including /iu/, /ui/, /au/, /ai/, /ou/, /oi/, /ei/, /ea/, and /eu/. The preferred slot for a diphthong is in the root-final position: e.g. *biu* [biu] ‘calf’, *ɾiu* [ɾiu] ‘monkey’. If a grammatical word contains two phonological words and the first one ends in a diphthong, we can recognize the boundary between the two phonological words from the position of the diphthong, as in:

- (13) ʔou+te^haka
 [ʔou.tɛ^hɛ.kɛ]
 boy+baby
 ‘newborn (boy)’
- (14) d^hau+ŋá-pa
 [d^hɛu.ŋɛ̃.pɛ]
 month+five-NMLZ
 ‘fifth month’

Note that, in every diphthong, the first part is the peak and the second the offglide, and a diphthong does not occur with a final consonant in the same syllable both word-medially and word-finally.

The occurrence of a diphthong in the root-medial position in a monomorphemic word is rare, although not impossible, as in the monomorphemic lexeme *laika* [lɛi.kɛ] ‘work’. However, in general a diphthong has to be root-final. It is extremely rare for a diphthong to be followed by a consonant in the same syllable.

There may not be a pause between the components of a compound in contrast to a sequence of phonological words, but the component immediately following a diphthong receives a primary stress signalling the commencement of a new phonological word. Therefore, we can identify the end of the first phonological word based on the occurrence of a diphthong and the beginning of the new phonological word from the placement of a primary stress.

Note, however, that the role of a diphthong as a phonological word boundary signal is restricted to a compound of polysyllabic forms or a phrase of a number of words. If a root ending in a diphthong takes a cohering suffix or an enclitic, there is no pause between the root and the suffix and/or enclitic but together they constitute a phonological word. The cohering suffixes and enclitics do not bear stress. The absence of stress on the following morphemes and the potential placement of a pause after a sequence of cohering grammatical elements signal the end of a phonological word.

2.4 Other hints of phonological word boundaries

In Brokpa, the dorso-velar stops /k/, /k^h/, and /g/ have a more front place of articulation when they occur before /y/ [j]. However, these velars without the following /y/ are not articulated in that way. For example, the initial consonant /k/ in the ergative allomorph =*ke* is articulated with the back part of the tongue, but in *kyi* ‘dog’ the initial /k/ is articulated in a more front position of the velum, as is the case with /k^h/ in *k^hyi* ‘2:SG’. This phenomenon typically takes place in the initial boundary of a phonological word and serves as, what Trubetzkoy (1969: 284) calls,

a “special non-phonemic boundary signal”. If a compound or a phrase of two or more phonological words has an element commencing with a sequence of velar + /y/, they signal the beginning of a new phonological word as shown in bold in (15):

- (15) babur+**gyak**-pi
 [bɛ.'bʊr.'gʲək.pi]
 crawling+do-NMLZ.PFV
 ‘crawling/crawled’

Note that there are few suffixes with a velar + /y/ sequence. Examples include future imperfective marker *-gyu* (especially in the Sakteng accent),³ the adverbial *-gyan*, and the intensification/superlative marker *-kyaŋ*. Such a suffix does not cohere phonologically with the root and may form a separate phonological word. There could be a diachronic explanation for this kind of non-cohering suffixes. For example, the future imperfective marker *-gyu* appears to be from the lexical verb *gyuk* ‘to run’ cognate with Classical Tibetan <rgyu ba> ‘to move’.

Further, there are phonological processes such as vowel harmony and resyllabification operating on the boundary between an affix and its host. In a vowel harmony, the vowel of the root triggers the vowel of the suffix to change and agree with it in certain features. For example, the suffix *-mo* marks feminine gender as in *ɛa-mo* (deer-F) ‘doe’. If the root has a high-back vowel /u/, the vowel of the feminine gender suffix is raised, /o/ → [u] as in [‘tɕ^hu.mu] (river-F) ‘river’, [‘lúː.mu] (serpent. spirit-F) ‘female serpent spirit’. Resyllabification can involve an initial consonant of a suffix. For example, the vowel /a/ from the locative nominalizing suffix *-sa* can be deleted and its initial consonant /s/ becomes the syllable-final consonant of the preceding host, e.g. *d^ho-sa* → *d^hos* (live:NMLZ:LOC) ‘staying place/residence’, *ɖo-sa* → *ɖos* (go:NMLZ:LOC) ‘going place/destination’. Similarly, the final vowel from a word formed via an instrumental nominalization can be omitted and the initial consonant /m/ becomes the coda of the host, e.g. *tɕ^hax-ma* → *tɕ^hax:m* (sweep:NMLZ:INS) ‘broom’, *t^hax-ma* → *t^hax:m* (tether:NMLZ:INS) ‘tethering rope’.

Table 1 provides a summary of the phonological principles for recognizing a phonological word in Brokpa.

Each of these phonological processes, given in Table 1, provides hints about the phonological word boundaries. We now move on to the structure of grammatical words and the relationship between phonological and grammatical words.

3. In the Merak accent, the future *-gyu* is realized as *-gu*.

Table 1. Phonological word boundary signals in Brokpa

	Feature	Phonological word boundary	
		Beginning	End
Prosodic	primary stress	yes	no
	secondary stress	no	yes
	high tone	yes	no
	pause	yes	yes
Segmental	glottal stop	yes	yes
	breathy stops	yes	no
	voiced glottal fricative	yes	no
	voiceless liquids	yes	no
	lamino-palatal nasal	yes	no
	voiced apico-alveolar affricate	yes	no
	diphthong position	no	yes
Phonological	velar fronting	yes	no
	vowel harmony	no	yes
	resyllabification	no	yes

3. Grammatical word

A grammatical word will be the unit just above ‘morpheme’ (inflectional and derivational) and below ‘phrase’ in the hierarchy of grammatical units in Brokpa. Dixon (2010: 13–19) and Dixon and Aikhenvald (2002) put forward a range of criteria for recognizing grammatical words cross-linguistically. They include conventionalized coherence and meaning, cohesiveness, fixed order of morphemes, and one inflectional affix per word. Bickel and Zúñiga (2017) suggest criteria such as domains of inflectional morphology selection, degree of syntactic cohesion, morphological positioning and behaviour for determining grammatical words in polysynthetic languages. Aikhenvald et al. (2020: 2) point out that “grammatical word is the target for syntactic operations. Functions within a clause and a sentence are defined in terms of grammatical words and their roles in the overall argument structure”.

A grammatical word in Brokpa can be identified on the basis of conventionalized coherence and meaning, fixed order of morphemes, and cohesiveness. If a grammatical word is made up of more than one component, the components must behave as one grammatical whole for the purposes of derivational and inflectional marking.

Table 2 shows the morphological processes that Brokpa employs for forming grammatical words. All the morphological processes in Table 2 are productive in Brokpa.

Table 2. Morphological processes for deriving grammatical words in Brokpa

Morphological process	Example	Gloss	Meaning
lexical root (zero derivation)	<i>eiŋ</i>	tree	'tree'
noun incorporation	<i>sem+ei</i>	mind+die	'to despair'
verb serialization	<i>p^{hir}+t^{hoŋ}</i>	spin+send	'to spin'
compounding	<i>eiŋ+zoba</i>	wood+artisan	'carpenter'
reduplication	<i>ɾapta ~ ɾapta</i>	thin ~ thin	'very thin'
prefixation	<i>ma-yakpo</i>	NEG-good	'bad'
suffixation	<i>ɔo-sa</i>	GO-NMLZ	'destination'

In order to understand the structure of phonological and grammatical words in Brokpa, it is important to draw essential distinctions between an affix and a clitic in this language.

An affix in Brokpa functions on the word level, e.g. *zim-ru?* (cat-DIM) 'kitten', where the diminutive suffix *-ru?* forms an integral part of the resulting grammatical word. In contrast, a clitic functions above the word level with scope over a phrase or over an entire clause, e.g. *muzi=ge dzin-hoŋ* (other=ERG give-POSSIBILITY) 'they might give', where the ergative case =*ge* marks relationships within a clause.

An affix typically attaches to a root belonging to a single syntactic category (high selectivity of host). For example, the agentive nominalizing suffix *-gan/-gin* attaches only to a verb root, e.g. *zam-gan* (eat-NMLZ:AGTV) 'eater', *sim-gin* (die-NMLZ:AGTV) 'the late (someone no longer alive)'. The suffix *-gan/-gin* cannot attach to a noun or an adjective, **p^{hr}ugu-gan* (child-NMLZ:AGTV), **ɽecin-gin* (good-NMLZ:AGTV).

On the other hand, an enclitic can attach to a host word belonging to a variety of syntactic categories (less selective). For example, a plural enclitic can attach to an NP argument whose head is a noun, a pronoun, or a demonstrative, e.g. *ɽeloŋ=ba?* (boy=PL) 'boys', *k^{hy}i=ba?* (2:SG=PL) 'you(s)', *ɽoti=ba?* (DEM:PROX=PL) 'these'. The plural enclitic can also attach to a predicate, e.g. *lap-p^{hi}=ba?* (say-NMLZ=PL) '(things) said'.

An affix directly attaches to the head of an NP, e.g. *dza-ru? maŋbu=zi?* (bird-DIM many=INDF) 'several chicks'. An affix associated with the head noun cannot attach to a modifier, **dza maŋbu-ru?=zi?* (bird many-DIM=INDF). In contrast, an enclitic occurs with the last modifier, if there are several modifiers in an NP, e.g. *ɽeloŋ kyapt^hokpa eukcin=ei?* (boy handsome strong=INDF) 'a strong handsome boy'. An enclitic attaches to the head only if there are no modifiers in the NP.

A root has only one affix and there cannot be a sequence of two or more derivational suffixes following a root, **ɽiŋzi-tean-ein* (compassion-ADJ-ADJ); but a word can be followed by two or more enclitics, e.g. *ta=ba?=te* (horse=PL=TOP) 'the horses'. When a host takes a suffix as well as an enclitic, the enclitic is always

placed after the suffix, e.g. *ke:p^{hi}=baʔ* (be.born-NMLZ=PL) ‘those born’. The reverse, host + enclitic + suffix, is disallowed, **ke:=baʔ-p^{hi}* (be.born=PL-NMLZ), **ta=baʔ-ruʔ* (horse=PL-DIM).

An affix in Brokpa is different from a clitic, in that the former assembles a grammatical word with the lexical base to which it is attached, while the latter does not form a grammatical word with the host. Clitics in Brokpa do not participate in derivations, and they do not qualify as derivational suffixes.

A clitic in Brokpa also differs from a lexical grammatical word, in that it cannot form a lexical base to which derivations and inflectional process may apply. Clitics in Brokpa show a wider range of attachment options and are either prosodically dependent on a host, or else may cluster together (if there are multiple clitics) to form their own prosodic domains.⁴

Now we look at grammatical words involving nouns, adjectives, and verbs as a lexical base, as well as those involving compounded and reduplicated stems.

3.1 Nominal stem

A nominal grammatical word can be just a lexical noun or a pronoun. Recall from Table 2 that a lexical root is considered a stem after zero morphological derivation. A stem will be a minimal grammatical word with an invariant shape, idiosyncratic meaning, and the ability to host grammatical morphemes. The possible concept of the structure of a grammatical word with a nominal (noun/pronoun) stem is schematised as follows:

1. PREFIX: Gender
2. ROOT/STEM: Noun/pronoun
3. SUFFIX: Gender, evaluative, adjectival, adverbial

Schema 1. Structure of grammatical word with a nominal stem in Brokpa

As shown in Schema 1, there are four sets of suffixes and one prefix associated with nouns.⁵ A nominal stem, making up a full grammatical word on its own, may take

4. For typology of clitics see, inter alia, Zwicky (1977, 1985), Zwicky and Pullum (1985), Sadock (1991, 1995), Aikhenvald (2002), Dixon (2010: 20–22), and Aikhenvald et al. (2020).

5. The morphemes *p^{ho}* (male) or *mo* (female) marking natural gender of animate entities occur as a prefix to some animate nouns or as a suffix to others. In most cases, the gender morphemes are suffixed to the root. With some higher animals, they are prefixed, e.g. *mo-kyi* (F-dog) ‘bitch’, *mo-lúʔ* (F-sheep) ‘ewe’, *p^{ho}-p^{ha}ʔ* (M-pig) ‘boar’, *p^{ho}-ta* (M-horse) ‘stallion’. Natural gender marking is analyzed as affixation and not as compounding. These two gender morphemes can be attached to all nouns which can be specified for natural gender (extended to some natural phenomena)

any of the suffixes and form a new grammatical word, as in the two examples in (16). A lexical grammatical word formed in this way corresponds to the head or to the modifier slot in phrase structure. A grammatical word formed by an affixation involving a nominal stem plus a gender or evaluative morphology (augmentative, diminutive), or a reflexive suffix is an instance of non-word-class-changing derivation; that is, the form after affixation has applied also remains a noun. Consider:

- (16) a. ri=di ts^hur ri yón=næ pa-mo=tɕiʔ len
 mountain=DEF this.side mountain left=ABL juniper-F=INDEF bring:IMP
 ‘Bring a female juniper tree from the left side of the mountain to this side’
 b. ŋa=i nor+breŋ=la kyi-ruʔ sum yo
 1:SG=GEN cattle+hut=LOC dog-DIM three EXIST.EGO
 ‘I have three puppies in my cattle-herder’s hut’

In (16a), the grammatical word *pa-mo* ‘female juniper tree’ formed by the root *pa* ‘juniper’ and the gender suffix *-mo* is head of the NP in a peripheral (oblique) argument slot hosting the indefiniteness enclitic =*tɕiʔ*. Similarly, in (16b) the noun *kyi* ‘dog’, making up a full grammatical word on its own, takes the diminutive suffix *-ruʔ* and derives a new grammatical word ‘puppy’. In both (16a) and (16b), affixation does not change the word class of the resulting form. A grammatical word formed by a nominal stem plus an evaluative morphology (augmentative/diminutive) suffix is an instance of non-word-class-changing derivation.

A nominal stem can take an adjectival suffix or an adverbial suffix and derives a new grammatical word. A grammatical word formed in this way, by adding an adjectival or an adverbial suffix to a nominal stem, is an instance of word-class-changing derivation. Consider:

- (17) a. mí=di násmeti za-zin yo-ti=ziʔ
 person=DEF very.much charisma-ADJ EXIST-NMLZ=INDF
 ‘The person is a charismatic one’
 b. bru ta k^huzu-tɕan
 grain horse load-ADV
 ‘horse loads of grain’

In (17a), the resulting grammatical word *za-zin* is an adjective meaning ‘charismatic’ derived by adding the suffix *-zin* to the noun *za* ‘charisma’. Similarly, in (17b) the noun *k^huzu* ‘load’ takes the suffix *-tɕan* and forms an adverb *k^huzu-tɕan* meaning something like ‘in/as horse loads’.

and function as grammaticalized markers. Both the masculine marker *p^ho* and the feminine marker *mo* are of the light type of CV syllables and they cohere phonologically with the host to which they are attached; that is, they behave as affixes.

Each of the grammatical words in (16) and (17) has a conventionalized coherence and meaning, the components occur together (cohesive) and in fixed order, and are the target of syntactic operations. A new grammatical word, formed by affixation, can take one or more enclitics appropriate to the word class of the newly formed grammatical word.

3.2 Adjectival stem

Adjectives in Brokpa have two prefixes and two types of suffixes. The prefixes include the negation marker *ma-* and the emphatic negative intensifier *man-*. The two types of suffixes associated with adjectives are the comparative/superlative markers, which are non-word-class-changing, and the adverbial suffixes which change the word class of the newly derived grammatical words. Note that adjectives and verbs share these two sets of negation markers, but they show different derivations and occupy different functional slots in the phrase and clause structure. Further, verbs have an additional negation marker *mi-* which does not apply to adjectives. Schema 2 gives the possible structures of grammatical words with an adjective as stem.

1. PREFIX: Emphatic negative intensifier, negation
2. ROOT/STEM: Adjective
3. SUFFIX: Comparative/superlative, adverbial

Schema 2. Structure of grammatical word with an adjectival stem in Brokpa

Akin to a grammatical word with a nominal stem, a minimal adjectival grammatical word can be just a monomorphemic lexical adjective, as in:

- (18) a. *muzu yóm tɕ^hukpu=ziʔ=k^he lán+yon-na...*
 other another rich=INDF=ERG beg+come-COND
 ‘If other rich people come to beg (propose)...’
- b. *p^hadzu=di pemasiti yakpo na*
 astrologer=DEF unrivalled good COP.FACT
 ‘The astrologer is exceptionally good’
- c. *ʔot Hindi=gi zap^ha násmeti ʔeɕin tuʔ*
 DEM Hindi=GEN song very.much nice EXIST.EVI:DIRECT
 ‘This Hindi song is extremely nice’

A grammatical word realized by a monomorphemic lexical adjective has a modifying role in the NP argument structure, as in (18a). A lexical adjective also functions as a copula complement, as in (18c). An adjectival stem constituting a grammatical word in its bare form can freely function as a complete utterance.

Further, an adjective can take a comparative or superlative suffix, and form a new grammatical word. The word class of the resulting form remains the same as the adjectival stem. Consider:

- (19) a. *yaŋna tɛ^he-ɛo láu yo-na tɛ^he-ɛo tʰi:r+kʰer=næ...*
 DISJ big-COMP near EXIST-COND big-COMP lead+take=ABL.SEQ
 ‘Or else, if the elder (one) is near, take the elder (one)...’
- b. *gonor gaŋyu naŋ=næ yá? ɖak-ta*
 farm.cattle all RELAT:INSD=ABL yak good-SUPER
 ‘Of all the farm cattle, yak is the best’

Note that an adjective may undergo morphophonological processes including truncation before an affixation, as in the two examples in (19). The comparative suffix *-ɛo* is attached to the truncated form of the adjective *tɛ^hetpu* ‘big’, as in (19a), and the superlative suffix *-ta ~ -da* to the truncated form of *ɖakpo* ‘good’, as in (19b). The newly formed grammatical word, containing an adjectival root and a comparative/superlative suffix, has a conventionalized coherence and a new meaning; the newly formed grammatical word functions as the parameter of comparison. The adjectival stem and the suffix, *tɛ^he-ɛo* ‘elder/bigger’ and *ɖak-ta* ‘best’, must occur together and in this fixed order to carry the new meaning. The order of the stem and the suffix cannot be reversed, **ɛo-tɛ^he*, **ta-ɖak*, nor can the components be scattered within the clause, **tɛ^he láu ɛo*.

A grammatical word can be formed by a lexical adjective plus an adverbial suffix. This is an instance of word-class-changing derivation; the resulting form is an adverb and not an adjective. Consider:

- (20) *Hindi=gi zapʰa ʔeɕin-gyan zot+taŋ-du?*
 Hindi=GEN song nice-ADV prepare+send-DIRECT
 ‘(Someone) has nicely sent Hindi songs’

The adjective *ʔeɕin* ‘nice/kind’ takes the suffix *-gyan* and forms an adverb with a meaning ‘nicely’, a new grammatical word. The derived adverb modifies the complex verb stem, formed by a serialization of two verbs, functioning as the head of predicate. As with other grammatical words, this derived adverb has a coherent meaning, it must occur in this order, and has its own functional slot within the verb phrase, that of modifying the predicate and always preceding it.

Certain adjectives, typically some members from the value semantic type, can be negated. This means that an adjectival grammatical word can also be formed by a negation prefix plus an adjective root, e.g. *ma-yakpo* (NEG-good) ‘bad’, *má-tʰaŋbu* (NEG-straight) ‘crooked’. Note that the negative marker occurs as an infix in a few adjectives. For example, the negated form of the adjective *ʔeɕin* ‘good’ is *ʔe-ma-ɕin* ‘bad’ in which *ʔe-* and *-ɕin* cannot be segmented as separate morphemes. An

example of a grammatical word formed by a sequence of two prefixes – emphatic negative intensifier and negation – and an adjectival stem is given in (33b) in § 5.

Another structure of a grammatical word with an adjective as the base can be an adjectival stem, formed by a compound of a noun, an adjective, and an adverbial suffix, deriving an adverb, such as *p^hredo+te^hetpo-gyan* (jealousy+big-ADV) ‘jealously’. A partially or fully reduplicated adjectival stem may take a suffix and be a grammatical word, *ɲarmu~ɲar-kyan* (strong~strong-SUPER) ‘extremely strong/ really strong’, *ts^hap~ts^hap-gyan* (hurry~hurry-ADV) ‘hurriedly’.

3.3 Verbal stem

Unlike a noun or an adjective, a verb root in Brokpa is in bound form and has to undergo a morphological process to be in the citation form. Typically, the nominalizer and the perfective aspect marker *-pi* ~ *-pe* (or its allomorphs) functions as the marker of citation form of a verb, e.g. *yar-pi* (run-NMLZ) ‘ran/running’, *ri-li* (roll-NMLZ) ‘rolled/rolling’. No element can intervene between the verb root and the nominalizing suffix.

If a verb root stands alone, then it is generally in the imperative form. For some verbs, the root and the imperative form are the same. For example, *yar* is the imperative form of the root *yar-* ‘to run’. Note that the imperative form may bear a sentence stress or a rising intonation.

A further instance in which a verb root can occur on its own, without affixes, is after the application of ablaut, e.g. *zo* (the imperative of verb *za* ‘eat’); or after ablaut and aspiration, e.g. *t^ho* (the imperative form of verb root *ta-* ‘see’). There are six sets of suffixes and two prefixes associated with verbs. Schema 3 gives the possible structure of grammatical word with a verbal stem.

1. PREFIX: Emphatic negative intensifier, negation
2. ROOT/STEM: Verb
3. SUFFIX: Aspect, knowledge, nominalizer, causative, clause linker, clause-final

Schema 3. Structure of grammatical word with a verbal stem in Brokpa

The prefixes associated with a verb are *ma-* which negates the predicate in perfective aspect, *mi-* in imperfective aspect, and the emphatic negative intensifier *man-*. The suffixes associated with verbs include aspect, egophoricity and evidentiality (knowledge), various nominalizing suffixes, causative, clause-final markers, and the grammaticalized markers of various types of clause linkages.

A grammatical word with a verbal stem can be formed by a verb plus any of the prefixes or suffixes shown in Schema 3. It is beyond the scope of this paper to discuss each and every suffix associated with verbs.

A verb stem may take a prefix and a suffix, or it may take a sequence of two prefixes and a suffix at the same time, if they are inflectional. Consider:

- (21) a. *mík=ke t^hoŋ-ro=raŋ me-na=ye...*
 eye=INS see-FINAL=FOC NEG.COP-COND=EMPH
 ‘Even if it is not seen with eyes...’
- b. *k^hi=ge ma-dzin-ni zak-nan...*
 2:SG=ERG NEG-give-PFV keep-COND:TOP
 ‘If you do not give...’
- c. *k^hyo=e brek+zak-pi*
 2:SG=ERG push+keep-PFV
 ‘You pushed’

In (21a) there are two verbal grammatical words involving the stem+suffix structure (shown in bold). The first one, formed by the verb stem *t^hoŋ* ‘see’ and the suffix *-ro*, takes the enclitic *=raŋ* marking focus. Similarly, the negative copula *me* and the conditional suffix *-na* form a grammatical word, and then take the enclitic *=ye* marking emphasis. The grammatical word with verb stem, shown in bold, in (21b) is an example of the grammatical word involving the prefix+stem+suffix structure. The stem, as already mentioned, can be a complex one formed by two roots as in (21c). A verbal grammatical word can be formed by a sequence of two prefixes (emphatic negative intensifier+negation) and stem, as shown in (33a) in § 5.

Further types of verbal grammatical words involve noun incorporation and verb serialization. Brokpa has a lexical compounding type of noun incorporation (see Mithun 1984; Aikhenvald 2007 on types of compounding), whereby a nominal constituent is added to a verbal word and the resulting form describes a single event and effectively functions as one grammatical word.

We analyze both noun incorporation and verb serialization in Brokpa as one grammatical word because the resulting form has a conventionalized coherence and meaning, and behaves as a single grammatical whole with regard to derivational and inflection marking, along the lines of Aikhenvald et al. (2020). The components of a noun incorporation or a serial verb construction have a high degree of ‘syntactic cohesion’ (Bickel & Zúñiga 2017: 5), and form a grammatical word. However, each component of a noun incorporation or a verb serialization may bear a primary stress, if they are non-cohering, and show the status of an independent phonological word. No word-internal phonological processes can be accounted for by both noun incorporation and verb serialization.

A verb stem formed by noun incorporation or verb serialization, making up a grammatical word on its own, can be accompanied by optional suffixes and enclitics, given in Schema 3 marking different grammatical categories. Consider the two examples in (22):

- (22) a. $\eta a=e$ $k^h y o=la$ **gau+ts^hor-ri**-yin=s
 1:SG=ERG 2:SG=DAT happiness+feel-PFV-EGO=ASSERT
 ‘I loved you’
- b. náma **pak+k^her-zin**...
 bride separate+take-SIM
 ‘While taking the bride...’

In Example (22a) the noun *gau* ‘happiness’ and the verb *ts^hor* ‘to feel’ form a complex but single predicate *gau+ts^hor* achieving the meaning of a single verb ‘to love’. The resulting form takes the nominalizing suffix *-ri*, also marking perfective aspect. Similarly, in (22b), two verbs constitute a single predicate taking the simultaneous clause chain marker *-zin*. The two components of the noun incorporation in (22a) and the serial verb construction in (22b) are contiguous and the components must occur in this fixed order to have the same meaning.

The components of both noun incorporation and serial verb construction must occur together, but not necessarily adjacent to each other; that is, the components can be non-contiguous. However, they cannot be scattered anywhere in the clause. The components of a noun incorporation or serial verb construction together function as a single predicate, and other elements may be allowed to intervene only within the predicate. The components form one grammatical unit for the purposes of derivational and inflectional marking. For instance, the verb stem *ló+tsəŋ* (rational.mind+sell) ‘to embarrass’ is formed by incorporating the noun *ló* to the verb *tsəŋ*. Similarly, the complex verb stem *ploi+taŋ* (plough+do) ‘to plough’ is a serialization of two verb roots, *ploi* ‘to plough’ and *taŋ* ‘to do/send’. Other words may be allowed to intervene only within the predicate. The two examples of complex verb stems just cited, *ló+tsəŋ* and *ploi+taŋ*, are repeated in the two sentences in (23):

- (23) a. $\eta a=e$ **ló** $t\epsilon i$ $t s o \eta -p^h i$
 1:SG=ERG rational.mind what sell-PFV
 ‘How did I embarrass (someone)?’
- b. $k^h i=ge$ **ploi** $t\epsilon i t\epsilon i n$ **taŋ**- $\eta a i$ lo
 2:SG=ERG plough how do-PFV Q
 ‘How did you plough?’

In (23a), the two components of the complex predicate are in two non-contiguous syntactic slots. The interrogative *tɛi* ‘what’ is allowed to intervene between the incorporated noun *ló* and the verb stem *tsəŋ*, which form the predicate. Similarly,

the two components of the complex predicate *ploi+taŋ* (plough+do) ‘to plough’ in (23b) are allowed to be non-contiguous with the interrogative *tciŋsin* ‘how’ intervening.

The complex predicate in both (23a) and (23b), however, functions as a single lexical unit and fulfils the same role as a lexical verb, along the lines of Mithun (1984) and Aikhenvald (2007). The two lexical roots are bound into, what Bybee (1985: 98) calls, a single ‘derivational expression’. Even if the two components of the complex predicates are not adjacent to each other within a predicate, they are semantically inseparable and indivisible from what they represent together, along the lines of Bolinger (1963). The components of noun incorporation and serial verb construction in Brokpa behave as one grammatical whole, and share aspect, egophoricity, evidentiality, polarity, modality, and mood values; hence they result in the creation of one lexical word or dictionary entry (see Wangdi Forthcoming). The components also occur in fixed order, such as the nominal component always preceding the verb stem within a predicate.

A verb stem may be accompanied by a modal auxiliary as in (24a) and (24b) or by a sequence of two modal auxiliaries as in (24c):

- (24) a. *k^hoŋ=ge lúʔ=ziʔ dzin-ŋoŋ*
 3:PL=ERG sheep=INDF give-POSSIBILITY
 ‘They might give a sheep’
- b. *ri=di p^hap-go-p^hi*
 mountain=DEF bring.down-OBLIGATION-PFV
 ‘The mountain must be brought down’
- c. *lale=k^he den ʔou=la=ye tciŋ dʒi+ta-go-ŋoŋ*
 some=ERG PART boy=DAT=EMPH one ask+see-OBLIGATION-POSSIBILITY
 ‘Someone might have to at least ask the boy’

A verb stem plus auxiliary construction is to be distinguished from a verb serialization. A verb stem may be formed by a verb serialization or noun incorporation before combining with an auxiliary, as in (24c). We analyze stem+auxiliary (+auxiliary) construction as one grammatical word because the auxiliaries form one complex predicate with the verb stem and take grammatical markers. Note that auxiliaries themselves may code modal or aspectual meaning. A grammatical word formed by a stem plus a sequence of auxiliaries will be a typical instance where one grammatical word contains more than one phonological word. Each verb root forming the stem retains its primary stress; an auxiliary may or may not be stressed depending on the number of syllables in a resulting word (see Wangdi Forthcoming).

3.4 Compounding

Compounding is a productive derivational process in Brokpa. A compound is considered a single grammatical word (Dixon 2010: 138; Aikhenvald 2015: 77; Aikhenvald et al. 2020). The components of a compound in Brokpa occur together and in a fixed order and inflection processes apply to the resulting stem, in agreement with Dixon (2010: 14). A compound forms a coherent word domain of affixation and encliticization in Brokpa, along the lines of hosting grammatical morphemes (Bickel & Zúñiga 2017).

In terms of phonological wordhood, compounds in Brokpa are of two types. Some compounds form one phonological word, and others more than one. For ease of reference, a compound of the former type can be called a “cohering compound” and of the latter a “non-cohering compound”⁶

A cohering compound is typically a disyllabic compound, formed by two monosyllabic roots, in which the two components of a compound cohere into a single phonological word and bears a single primary stress. The components of a compound can potentially be from any major word class, but the resulting compound is always a noun. Examples are given in (25):

(25)	Example	Gloss	Meaning
	<i>luŋ+nor</i> [ˈluŋ.noɾ]	valley+cattle	‘lowland cattle’
	<i>p^ha+ma</i> [p ^h e.me]	father+mother	‘parents’
	<i>d̪i+zəŋ</i> [d̪i.ˈzəŋ]	smell+good	‘camphor’
	<i>ni+zɛɾ</i> [ni.ˈzɛɾ]	sun+ray	‘sunlight’
	<i>na:+t^hi</i> [ˈnɛ.t ^h i]	sleep+trestle	‘bed’
	<i>za+t^huŋ</i> [zɛ.t ^h uŋ]	eat+drink	‘edibles’

An indication that a cohering compound constitutes a single phonological word is the fact that the resulting form has a single primary stress. Further indication is that a cohering compound typically functions as a lexical item or it is in an advanced stage of lexicalization.

Further evidence for a cohering compound as a single phonological word comes from the process of vowel harmony operating within a compound formed by two monosyllabic roots. This is in addition to the single primary stress that the resulting disyllabic compound bears. Typically, the vowel of the first component of a

6. The terms “cohering” and “non-cohering” are employed here as used by Dixon (1977) in his classification of affixes in Yidip. We use them here to distinguish two types of compounds (“cohering compound” versus “non-cohering compound”) as well as two types of reduplication (“cohering reduplication” versus “non-cohering reduplication”) in Brokpa.

compound triggers the vowel of the second component to change and agree with it in certain features. For example, *ri* ‘mountain’ and *tse* ‘tip’ forms a compound [‘ri.tsi] ‘mountaintop’ in the surface form, causing the mid vowel /e/ to raise to [i] on the trigger of the vowel /i/ of the first component. The same lexical root *ri* ‘mountain’ combines with another lexical root *go* ‘head’ forming a compound [‘riŋ.gu] ‘upper reaches of a mountain’, causing /o/→[u] raising in the surface form, again triggered by the high vowel /i/ of the first component. In this instance, the forming of a single phonological word involves a consonant epenthesis /ŋ/, which also suggests that phonological processes can operate on the boundary between the two components of a cohering nominal compound. Vowel harmony does not operate within a non-cohering compound.

A non-cohering compound is one in which the resulting form contains more than two syllables and each component bears its own stress, resulting in as many phonological words as there are components. Non-cohering compounding may involve two nominal roots, a noun and an adjective, or three nominal roots. A compound with three or more roots is rare. Examples of non-cohering compounds are given in (26):

(26)	Example	Gloss	Meaning
	<i>ɛiŋ+dzoktaŋ</i> [‘ɛiŋ.ˈdzok.təŋ]	tree+potato	‘cassava’
	<i>sem+tʰaŋbu</i> [‘sem.ˈtʰəŋ.bu]	mind+straight	‘honest’
	<i>ɛiŋ+dæ+kʰo:</i> [‘ɛiŋ.ˈdæ.kʰo:]	tree+result+liquid	‘fruit juice’
	<i>tɕʰambu+tʰunbu</i> [‘tɕʰəm.bu.tʰʊŋ.bu]	friendly+intimate	‘acquaintance’
	<i>láma+tɕʰospa</i> [‘lé.mə.ˈtɕʰos.pə]	lama+dharma.practitioner	‘religious personnel’

The components of these nominal compounds must be contiguous and be in a fixed order to carry the new meaning. No element can intervene between the components of a nominal compound and, unlike a cohering compound, no phonological processes operate across the components of these non-cohering compounds. In a nutshell, all nominal compounds can be recognized as a single grammatical word. Also, in terms of phonological wordhood, a cohering compound constitutes a single phonological word, and a non-cohering compound more than one phonological word. A non-cohering compound contains precisely as many phonological words as there are components in it.

3.5 Reduplication

Reduplication in Brokpa, similar to compounding, creates one grammatical word with inflectional marking on an entire reduplicated form rather than on each reduplicant. Examples include *tʰikʰik=ziʔ* ‘accurate=INDEF’, and *dʰa~dʰa=raŋ* (month~month=FOC) ‘several months’. It is not possible for each reduplicant in these two examples to show inflections separately: **tʰik=ziʔʰik=ziʔ*, **dʰa=raŋ ~ dʰa=raŋ*.

In terms of phonological wordhood, reduplication in Brokpa may be divided into two types: “cohering reduplication” and “non-cohering reduplication”.⁷

Cohering reduplication results in a single phonological word bearing a single primary stress. A cohering reduplication in Brokpa is essentially an inherent reduplication with the single form (reduplicant) having no meaning. No pause can be inserted between the reduplicants. Some adjectives, nouns, and ideophones involve cohering reduplication, e.g. *taktak* [‘tək.tək] ‘exact’, *tʰuŋtʰuŋ* [‘tʰuŋ.tʰu:] ‘crane’, *durdur* [‘dɔr.dɔr] ‘peal of thunder’. The root is stressed and the repeated form is phonetically weakened and unstressed, and the entire reduplicated stem constitutes one phonological word.

In contrast, non-cohering reduplication typically involves a full reduplication in which each reduplicant retains its primary stress and constitutes a separate phonological word, as in (27):

- (27) *tʰiktəŋ~tʰiktəŋ*
 [‘tʰik.təŋ.tʰitəŋ]
 stripe~stripe
 ‘striped’

Non-cohering reduplication can also involve a partial reduplication. For example, an adjective in the superlative form is derived through a partial reduplication, in which the first syllable of the root is repeated with an independent primary stress and then the superlative suffix *-da* is added to the reduplicated form, as in (28), or it can be an inherent but partially reduplicated word, as in (29):

- (28) *tsəŋma~tsəŋ-da*
 [‘tsəŋ.mə.təŋ.də]
 clean~clean-SUPER
 ‘extremely clean/cleanest’

- (29) *kyaka~kyoko*
 [‘kjə.kə.kjo.ko]
 ?~?
 ‘crooked’

7. Aikhenvald et al. (2020) also employ the terms “cohering reduplication” and “non-cohering reduplication”.

Non-cohering reduplication can involve a number word as in *saya~saya* [ʃe.je.ʃe.je] (million~million) ‘millions’, an adjective as in *ɽapta~ɽapta* [rəp.te.rəp.te] (thin~thin) ‘extremely thin’, or a verb as in *ploi~ploi* (roll~roll) ‘roll (several times)’. Non-cohering reduplication involving a noun is rare.

3.6 Non-cohering function words

As with any language, Brokpa has several words which do not belong to the major word classes of nouns, adjectives, or verbs, but can stand alone as a complete utterance. These words enjoy a high frequency of occurrence as well as freedom of occurring potentially anywhere within a sentence. For ease of reference, these words can be called “non-cohering function words”.

Non-cohering function words include fixed expressions such as *mazi* ‘in fact’, *ɽomats^haeti* ‘furthermore’, *lasokpo* ‘so on, et cetera’. Some of these words may be syntactically considered as sentential adverbs and others as conjunctions. Interjections such as *han* ‘alas’, *ɽakhai* ‘yuck’, *yalama* ‘gosh’ and prompters of attention such as *wái* ‘hey’ and *ɽehem* ‘ahem’ will fall under this heading.

Further types of non-cohering function words include discourse particles such as *te*, *da*, *den*, *ɽeɽ*, *ɽa*, and honorific particles *lá* and *láso* ‘yes, okay’. Among others, these discourse particles are used as hesitation fillers or to move the discourse forward without indicating any specific relationship between what comes before and what comes after. Similarly, the honorific particles can be used as a one-word response to a polar question. Finally, non-cohering function words include time words such as *dirij* ‘today’ and local adverbial demonstratives such as *ɽola* ‘here’.

It will be beyond the scope of this paper to discuss all the types, forms and functions of these non-cohering function words in this language. Suffice it to say here that such a word will be both a grammatical and a phonological word. A non-cohering function word can stand as a complete utterance on its own and bears a primary stress and an optional secondary stress if it involves more than two syllables. Consider sentence (30):

- (30) *te da dirij ɽola te tɽar-ri-yo=se zu-mi-yin*
 PART PART today here PART call.ON-PFV-EXIST.EGO=QUOT say:HON-PFV-EGO
 ‘I would like to say that I have come (called on you) here today’

In (30), the morphemes *tɽar* and *ri* have to be together as do the morphemes *zu* and *mi*. If we change the order of morphemes in these two words, they will be ungrammatical.

In contrast, the words such as *dirij* ‘today’ and the local adverbial demonstrative *ɽola* ‘here’ can potentially be positioned anywhere within the sentence without affecting the meaning of the sentence. We can deduce that morphemes like *tɽar* and

ri together constitute a single grammatical word and the morphemes like *dirij* and *ʔola* are separate grammatical words.

Discourse particles such as *te* also offer evidence for the boundaries of a grammatical word. For example, the particle *te* comes up frequently in conversations and is typically positioned immediately before or after a grammatical word. The particle *te* does not occur before every grammatical word, but when it does, it signals the commencement of a new grammatical word in a clause. In Example (30), we can see the particle *te* before the grammatical word *tɛar-ri*. It is not possible for this particle to occur within the grammatical word, **tɛa-te-ri-yo* or **tɛa-ri-te-yo*.

The particles *da* ‘now’ and *den* ‘then/after that’ also behave in a similar fashion. Akin to the particle *te*, these two discourse particles appear frequently in conversations and provide a clue about the beginning of a grammatical word, due to their position at the start of a word, as in (31):

- (31) *te ʔo bomo=di den da muzu te da ɲori*
 PART DEM girl=DEF then now other PART now looks
yin-ne=ye den ʔa da yakpo=ziʔ tuʔ
 COP.EGO-CNSV=EMPH then INTJ NOW good=INDF EXIST.DIRECT
 ‘That girl, she has good looks’

Similarly, the quotative enclitic =*se* typically occurs immediately after a grammatical word. This quotative enclitic can occur with any constituent within the clause, not just at the end of a clause. Every time the enclitic =*se* occurs it shows that a grammatical word has ended just before it. If we view Example (30) again, the quotative enclitic is positioned after the grammatical word *yo* and preceding the grammatical word *zu-mi*. The enclitic =*se* does not occur within a grammatical word, **zu=se-mi*.

Consider another example in (32) where the quotative enclitic =*se* is placed immediately after a grammatical word:

- (32) *lú=ɛiʔ gya+nán-^hna kaɟin+te^he-ro=se*
 song=INDF do+give:HON-COND gratitude+be.big-FINAL=QUOT
zu-yo
 say:HON-EXIST.EGO
 ‘I would like to say that, if you sing a song, I will be grateful’

Based on the criteria for clitics, the quotative particle =*se* is an enclitic and forms a phonological word with a preceding host. In (32), the quotative enclitic =*se* cannot occur within the grammatical word preceding the suffix *-ro* which marks the end of the main clause within a reported speech construction, **kaɟin+te^he=se-ro*. The enclitic =*se* also cannot be placed before the grammaticalized egophoric suffix *-yo* within the next grammatical word, **zu=se-yo*.

Note that the quotative marker =*se* is originally from the verb *se* ‘to say’ and retains its lexical status elsewhere. Typologically, in many instances, verbs of speech grammaticalize into reported or quotative clitics as is the case, for instance, in many Qiangic languages, including Ersu (Zhang 2014), and across Tibeto-Burman languages, including Dzongkha (see also van Driem & Tshering 2019; Watters 2018).

4. Phonological word and grammatical word coincide

Phonological word and grammatical word in Brokpa coincide when a word has the following structure: a monomorphemic nominal root; a nominal root plus a suffix, a nominal root plus a prefix, an imperative form of a verb, a verb root plus a suffix, a verb root plus a prefix, cohering compound, cohering reduplication, and a non-cohering function word. Table 3 gives examples of the internal structure of items which can constitute an independent phonological and grammatical word.

Table 3. Phonological and grammatical words that coincide in Brokpa

Word structure	Example	Gloss
monomorphemic noun	<i>gyamaraza</i> [ˈgʲjɐ.mɐ.rɐ.zɐ]	‘a crossbred sheep’
monomorphemic adjective	<i>ʔesin</i> [ʔe.ɕin]	‘good’
nominal root + suffix	<i>ba-ruʔ</i> [ˈba:rʊʔ]	‘calf’
prefix + nominal root	<i>mo-ra</i> [ˈmo:rɐ]	(f-goat) ‘she-goat’
adjectival root + suffix	<i>tom-ɕo</i> [ˈtɔm.ɕɔ]	(short-COMP) ‘shorter’
prefix + adjectival root	<i>ma-dau</i> [mɐ.ˈdɐu]	(NEG-same) ‘different’
monosyllabic verb (imp)	<i>qui</i> [ˈqui]	(drag:IMP) ‘pull’
verb root + suffix	<i>lap-pʰi</i> [ˈlɐ:.pʰi]	‘say-NMLZ’
prefix + verb root	<i>má-pæŋ</i> [mɐ.ˈpɛŋ]	‘NEG-lie’
cohering compound	<i>p^ha+ma</i> [ˈp ^h ɐ.mɐ]	(father+mother) ‘parents’
cohering reduplication	<i>prakprak</i> [ˈprək.prɛ:]	‘roll of thunder’
function word	<i>mazi</i> [ˈmɐ.zi]	‘in fact’

In agreement with the definition of a grammatical word (Dixon 2010: 12–19; Dixon & Aikhenvald 2002), a grammatical word in Brokpa, involving any of the internal structures provided in Table 3, has as its base one or more lexical roots to which morphological processes have been applied. Each of these lexical-based words has a conventionalized coherence and meaning and can be accompanied by grammatical elements.

A monomorphemic lexeme, irrespective of the number of syllables, is non-segmentable with no intra-word pauses and is both a grammatical and a phonological word. As noted in § 3, a verb root has to undergo a morphological process to be in the citation form. A monosyllabic verb root in the imperative mood – after

the morphological process of stem suppletion, vowel gradation, aspiration, or zero derivation is applied – is both a phonological word and a grammatical word, e.g. *soŋ* ‘go:IMP’ (a suppletive form of root *dŋ*), *tʰo* ‘see:IMP’ (vowel gradation and aspiration of root *ta*), *yar* ‘run:IMP’ (zero derivation of root *yar*).

A verb root plus any one of the inflectional suffixes marking different verbal categories is an instance of grammatical word and phonological word coinciding, e.g. *ŋór-pʰi* [ʲŋór.pʰi] (sing-NMLZ.PFV) ‘sang/singing’, *láp-ku* [láp.ku] (read-FUT.IPFV) ‘will read’, *ŋar-kʰu* [ʲŋər.kʰu] (roar-FUT.IPFV) ‘will roar’. A word form consisting of a root plus an affix is a single ‘inflectional expression’ (Bybee 1985: 11), and is an instance where a phonological and a grammatical word coincide. When a root takes an affix, as shown in Example (30), the resulting form adheres to the principles of cohesiveness, non-recursiveness, uninterruptability, and isolatability in addition to satisfying other main criteria of a grammatical word suggested by Dixon (2010: 12–18). A great many verbal words in Brokpa will belong to this type, a root plus an affix.

Prefixes are generally reported to be non-cohering to a prosodic word across languages (Bickel 1998, 2003; Hildebrandt 2015; Hall & Kleinhenz 1999; Hall & Hildebrandt 2008; Hall et al. 2008). In Brokpa, there are only three sets of prefixes, negation *ma-* and *mi-*, gender prefixes *pʰo-* and *mo-*, and the prefix *man-* coding emphasis on a negated verb or a negated adjective. A negation or a gender prefix forms a prosodic unit with the root/stem and is part of one phonological word. The prefix *man-* does not cohere and forms a separate phonological word as will be shown in § 5. As noted in § 3.6, a function word is both a phonological and a grammatical word with independent primary stress and constitutes a complete utterance, among other aspects.

5. Phonological word and grammatical word do not coincide

Cross-linguistically, the processes of compounding, incorporation, and reduplication are typical “suspects” for one grammatical word involving more than one phonological word (Aikhenvald 2015: 77; Dixon 2010: 23–24; Dixon and Aikhenvald 2002; Aikhenvald et al. 2020). In Brokpa, as noted in §§ 3.4–3.5, non-cohering compounds and non-cohering reduplication are instances where grammatical word and phonological word do not coincide.

Non-cohering compounds were discussed in § 3.4 and non-cohering reduplication in § 3.5. As noted above, a further instance in which one grammatical word consists of two phonological words is the co-occurrence of the negation prefix *ma-* and the non-cohering negative intensifier *man-* with a stem. Example (33a) shows the prefix *man-* before a negated verb and (33b) before a negated adjective:

- (33) a. **man-má-suŋ**
 ['mən.mé-'sʊŋ]
 INTENS-NEG-say:HON
 'Don't really say (mean it)'
- b. **man-ma-ɖau**
 ['mən.mə.'ɖəu]
 INTENS-NEG-same
 'completely different'

The resulting form in both (33a) and (33b) can be recognized as one grammatical word. Among other requirements, the morphemes must occur adjacent to each other (be cohesive), and occur in this fixed order with nothing to intervene. The prefix *man-* adds emphasis or intensification to both the negated verb and the negated adjective. However, the prefix *man-* is stressed forming a separate phonological word. Therefore, a form with the prefix *man-* is an instance of one grammatical word but two phonological words.

Table 4 provides the possibilities of one grammatical word containing more than one phonological word.

Table 4. One grammatical word consisting of more than one phonological word in Brokpa

Morphological process	Example	Gloss	Meaning
Non-cohering compound	<i>kaŋliŋ-ruspa</i> ['kəŋ.liŋ.'ruspə]	trumpet-bone	'femur'
Non-cohering reduplication (full)	<i>tʰerbum~tʰerbum</i> [tʰɛr.bəm.tʰɛr.bəm]	billion~billion	'billions'
Non-cohering reduplication (partial)	<i>ŋarmu~ŋar-kyan</i> [ŋər.mu.ŋər.kjəŋ]	strong~strong-SUPER	'too strong'
Non-cohering prefix + stem	<i>man-ma-zæ</i> ['mən.mə.'zɛ:]	EMPH-NEG-eat:PFV	'really didn't eat'
Noun incorporation	<i>bro+tæ</i> [brɔ.'tɛ:]	taste+see	'to taste'
Serial verb construction	<i>tor+tan</i> [tɔr.'tɛŋ]	scatter+send	'to scatter'
Verb stem + auxiliary+auxiliary	<i>láp-tʰop-go</i> [láp.tʰop.'go:]	say-ABILITY-OBLIGATION	'must be told'

As noted in § 3.3, a verb stem formed by two or more roots, followed by auxiliaries, constitutes one grammatical word. However, each root of the verb stem is stressed and an auxiliary may also be stressed forming an independent phonological word.

Both noun incorporation and verb serialization result in the creation of one grammatical word, as pointed out in § 3.3; however, each component forms a separate phonological word.

6. Conclusion

A phonological word in Brokpa can be recognized by means of phonemic and non-phonemic boundary signals. Phonemic boundary signals include a number of distinctive phonemes that occur in the root-initial position either exclusively or predominantly. Non-phonemic boundary signals include prosodic feature of stress, tone, articulation of dorso-velars in a front position, and the placement of a pause.

Phonological and grammatical words coincide in the following instances in Brokpa: (1) when a word is a monomorphemic lexeme or a non-cohering function word; (2) when a word involves a lexical root plus an affix; (3) a cohering compound; and (4) a cohering reduplication. A grammatical word may consist of more than one phonological word when a word is formed by means of non-cohering compounding, non-cohering reduplication, or when a verb stem is formed by two or more roots and/or followed by auxiliaries which may be stressed.

In most cases, phonological and grammatical words coincide in Brokpa. However, as shown in the present study, there are instances where the two units do not coincide. Therefore, it is important to distinguish the two units, so as to produce a comprehensive analysis of the phenomenon in Brokpa, within the context of other Bodish and Tibeto-Burman languages.

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List of abbreviations

1	first person	HON	honorific
2	second person	IMP	imperative
3	third person	INDF	indefinite
ABILITY	ability (modality)	INS	instrumental
ABL	ablative	INSD	inside (relator)
ADJ	adjective/adjectival	INTENS	intensifier
ADV	adverb(ial)	INTJ	interjection
AGTV	agentive (nominalization)	IPFV	imperfective
ASSERT	assertive	LOC	locative case
CNSV	concessive	M	masculine
COMP	comparative	NEAR	near (relator)
COND	conditional	NEG	negation
COP	copula	NMLZ	nominalizer
DAT	dative	OBLIGATION	obligation (modality)
DEF	definite	PART	particle
DEM	demonstrative	PFV	perfective
DIM	diminutive	PL	plural
DIRECT	direct (or visual) evidential	POLAR	polar (question)
DISJ	disjunctive (connective)	POSSIBILITY	possibility/probability (modality)
EGO	egophoric	PROX	proximal
EMPH	emphasis	Q	question particle/marker
ERG	ergative	QUOT	quotative
EVID	evidential	REFL	reflexive
EXIST	existential verb	RELAT	relator
F	feminine	SEQ	sequential
FACT	factual (knowledge distinction)	SG	singular
FINAL	clause-final marker	SIM	simultaneous
FOC	focus	SUPER	superlative
FUT	future	TOP	topic
GEN	genitive		

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A. Appendix

Brokpa consonant phonemes

	Labio- Labial	Apico- Alveolar	Apico- Post-alveolar	Lamino- Prepalatal	Dorso- Velar	Glottal
Unaspirated voiceless stop	p	t	t̪		k	ʔ
Aspirated voiceless stop	p ^h	t ^h	t̪ ^h		k ^h	
Voiced stop	b	d	d̪		g	
Breathy-voiced stop	b ^{h̥}	d ^{h̥}	d̪ ^{h̥}		g ^{h̥}	
Unaspirated voiceless affricate		ts		tɕ		
Aspirated voiceless affricate		ts ^h		tɕ ^h		
Voiced affricate		dz		dz		
Voiceless fricative		s		ɕ		h
Voiced fricative		z		ʒ		ɦ
Nasal	m	n		ɲ	ŋ	
Voiceless lateral		ɭ				
Voiced lateral		l				
Voiceless tap		r̥ [ɾ̥]				
Voiced tap		r [ɾ]				
Semi-vowel	w			y [j]		

B. Appendix

Brokpa vowel phonemes

	Front	Near-front	Near-back	Back	
	Unrounded	Rounded	Unrounded	Rounded	
close	i	ü		u	high
close-mid	e	ö		o	high-mid
near-open	æ		a		near-low

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