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Languages and Peoples of the Eastern Himalayan Region (LPEHR)

Tone sandhi in Uipo

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ABSTRACT

Uipo, also called Khoibu, is an underdescribed Tibeto-Burman language spoken by around 1800 people in the Chandel district of Manipur. Uipo has four lexical tones: a high falling tone, a low level tone, a low falling tone and a high level tone. These are called Tone 1, Tone 2, Tone 3 and Tone 4 respectively. When tones are combined within one word, there are two different sandhi processes that occur. This article will look at the different contexts where tone sandhi happens, focusing on compounds, possessive constructions, and nominal attribution. For instance, a noun that starts with a Tone 1 or a Tone 2 syllable will get Tone 4 when following a Tone 2 possessive prefix. There are examples of minimal pairs that become homonymic in certain morphological contexts, and these are used to illustrate that the tonal category of a given words has really changed. Interestingly, what otherwise seem like phonological rules have some specific lexical exceptions. For instance, the word *toŋ$_1$kan$_2$* does not change its tone in contexts where it is expected. The sandhi rules are argued to be evidence that Uipo has a four-tone system, as opposed to what has been proposed by some previous accounts of the language which have described it as having only three level tones.

KEYWORDS

Uipo, Khoibu, tone, sandhi, Tibeto-Burman, phonology

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Tone Sandhi in Uipo[1]

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1 Introduction

Uipo (also sometimes called by the exonym Khoibu) is a language spoken by around 1800 people in the Chandel district of Manipur, India. It is a Tibeto-Burman language, but its genealogical affiliation within Tibeto-Burman is still uncertain. It has been suggested to belong to the proposed Kuki-Chin-Naga branch (Hammarström et al. 2020), but more study is needed to confirm this. Many aspects of Uipo remain undescribed and underdescribed, but the community has a group of particularly active community linguists engaged in language documentation and description, so work is underway. This paper will look at tone sandhi in Uipo. Uipo has four tones, and when these are combined either in compounds or through affixation, tone sandhi occurs. While this is generally a phonological process that can be predicted based on the phonological environment, there are certain lexical items and specific morphemes that do not behave as expected, placing this phenomenon in a peculiar position between phonology and the lexicon. An account of the data and methods will be given in Section 2, and an introduction to Uipo phonology follows in Section 3. Finally, Section 4 will introduce the sandhi rules and discuss where they apply.

2 Methodology and data

This paper is based on data that I gathered for my MA dissertation during two trips to the Uipo village of Khangshim in the Chandel district of Manipur. The fieldtrips were carried out in February of 2019 and 2020, and lasted for around three weeks altogether. My main consultant was Mosyel Syelsaangthyel Khaling, and Hopingson Syelnairan Ronglo was also of great help. In addition, I recorded a further 9 speakers. Altogether I have data from 5 men and 6 women, with an age range from 16 to 77. Some of the recordings showed evidence of list intonation, and could not be used to investigate tonal phenomena.

The recordings were made through elicitation, using a Zoom SDXC camera and a Zoom SSH-6 stereo shotgun microphone. When the speakers knew English, the prompts were given in English, and the speakers translated them into Uipo. When speakers did not know English they were given words and phrases in Uipo, and asked to repeat them. In those cases, Mosyel

[1] I am very grateful to Mosyel Syelsaangthyel Khaling and Hopingson Syelnairan Ronglo as well as Donkhamshang Ronglo, Reimoishang Ronglo, Bongphommoi Ronglo, Angshem Tontang, Sheltlunshang Khaling and Hongsha Kophom. I am also very grateful to Alena Witzlack-Makarevich, who was my MA supervisor, and Kellen Parker van Dam, who has helped me with many issues relating to tonal analysis. I am also grateful to Linda Konnerth and Pavel Ozerov, who helped me organize my fieldtrips.

Syelsaangthyel Khaling was present to clarify if my pronunciation left unclear which words were intended.

The recordings were then analysed using Praat (Boersma & Weenink 2020). For most of the examples given in this article, recordings from several people were examined to make sure that the tonal changes described are generally applicable to the language. In a few examples, however, I only had recordings from my main consultant.

3 Uipo phonology

Uipo has an inventory of 18 consonant phonemes. There are three series of oral stops: voiceless aspirated, voiceless unaspirated, and voiced. There are also three nasals, the two liquids /l/ and /ɾ/, the semivowels /j/ and /w/, one affricate /t͡s / and two fricatives /s/ and /h/. All the nasals and liquids can occur in coda position, but no fricatives can. The tree series of stops are reduced to just one series in codas, typically realized as an unreleased voiced stop. There are only four possible consonant clusters, and all four consist of either a voiceless aspirated or a voiceless unaspirated stop plus a liquid: /tr/, /tʰr/, /tl/ and /tʰl/. These are only found in the onsets of major syllables. The consonant inventory is illustrated in Figure 1.

	Bilabial	**Alveolar**	**Palatal**	**Velar**	**Glottal**
Plosive	pʰ p b	tʰ t d		kʰ k	
Nasal	m	n		ŋ	
Fricative		s			h
Affricate		t͡s			
Approximant	w		j		
Lateral		l			
Tap		ɾ			

Figure 1 – Uipo consonants

There are five distinct vowel qualities, namely /i/, /e/, /ə/, /o/, /u/, and the non-high vowels have the long allophones /eː/, /aː/ and /oː/. This is illustrated in Figure 2. There are also eight diphthongs: /əi/, /ei/, /ao/, oi/, /oːi/, /ou/, /eo/ and /ui/.

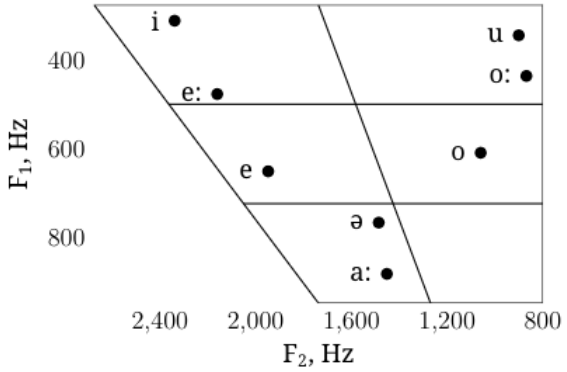

Figure 2 – Uipo vowels, based on measurements from four speakers, two men and two women.

Uipo has a difference between major and minor syllables (following the terminology of Butler (2015)). Every lexical word requires at least one major syllable (there are some function words that do not), and major syllables can be closed or open, and they can have one of the four possible consonant clusters in onset position. Closed syllables can have either a long or a short vowel, but open syllables have to have either a long vowel or a diphthong. Minor syllables, on the other hand, are always open, and always have a short schwa as their vowel. Minor syllables do not seem to have contrastive tone[2], and no minimal pairs have been found. When words are elicited in isolation, the minor syllables are typically pronounced with a short falling contour. It is common to find words with a sesquisyllabic structure, that is, words consisting of a minor syllable followed by a major syllable (See Sæbø (2020) for a discussion of different definitions of sesquisyllabicity and how the situation in Uipo compares to these). But it is also common to find minor and major syllables combined in other ways, and words can have multiple minor or major syllables. Words consisting of only a major syllable are also common. Most lexical words tend to end in a major syllable when they are in isolation, but as many suffixes consist of a minor syllable, words in context can end in a minor syllable.

There are four lexical tones. In this paper they will be referred to by a subscript number from 1 to 4. The first is a high to mid fall, the second is a low level tone, the third is a mid to low falling tone, and the fourth is a high level tone, sometimes realised as a mid to high rising contour. The third tone, and to a lesser extent the second tone, is associated with non-modal phonation in many speakers, however the extent to which this is part of the realisation of the phoneme or simply individual variation is something that requires further investigation. A (near) minimal quadruplet is shown in (1) – (4) below.

(1) *t͡ʃaː*$_1$
´child´

(2) *kət͡ʃaː*$_2$
´to walk´

(3) *t͡ʃaː*$_3$
´rice paddy´

(4) *t͡ʃaː*$_4$
´tea'

The figure below shows the four tones. It is based on measurements from five speakers, and the Hz values have been normalised and converted to semitones, following the methodology laid out in van Dam (2018). For a more detailed description of Uipo phonology, see Sæbø (2020). In Chao numerals the tones can be described as following: Tone 1: 53, Tone 2: 22, Tone 3: 41, Tone 4: 44.

[2] Possibly with the exception of minor syllables that are the result of a verbal stem of the form Caː being reduced in certain morphological contexts. This is something that requires further investigation.

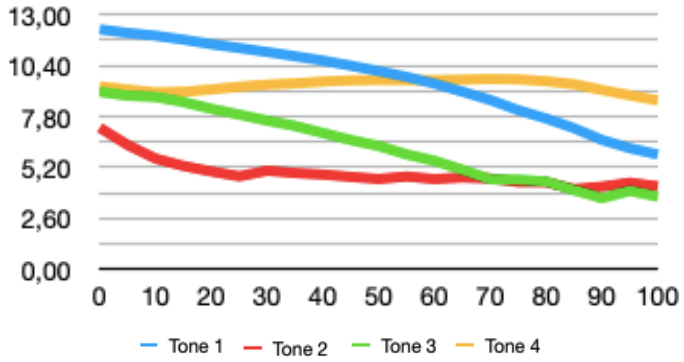

Figure 3 – The four tones of Uipo. Based on five tokens for each tone from five speakers. The Y axis shows semitones, the X axis shows duration in percent.

It has been difficult to establish the number of tones in checked syllables. Minimal pairs suggest that there are at least two tones: one falling and one level. However, the number of tonal minimal pairs with checked syllables is very small. In some cases, the tones in the checked syllables appear to follow the same sandhi rules as tones in smooth syllables, but it is still not clear whether this means there are really three or four contrastive tones. This is an area where more work is needed. For now, tone will not be marked on checked syllables.

The analysis presented here differs from that given in Singh (2014) and Singh (2016) where Uipo is described as having three tones. The processes of tone sandhi described in Singh (2014) also differs from that presented here and in Sæbø (2020). Section 4.7 will discuss this further.

4 Tone Sandhi in Uipo

This section will look at different phenomena in Uipo that are connected to tone sandhi. Section 4.1 will discuss tonal allophony, and Section 4.2 will introduce the main sandhi rules. Section 4.3 illustrates how these operate in compound nouns, while Section 4.4 looks at possessive constructions, Section 4.5 looks at nominal attribution, and Section 4.6 discusses various affixes.

4.1 Tonal allophony

There are two kinds of tonal alternation which occurs in Uipo. One regards the different realizations of one toneme depending on the phonological context it occurs in. The other regards categorical changes from one toneme to another. The latter is the main topic of this article, and will be discussed in the following sections. Before this, however, it will be useful to have an idea about the variation that can occur within a single tonal category.

First of all, it should be mentioned that there is some interspeaker variation when it comes to the realization of the various tonemes. Most notably, perhaps, is the fact that some speakers tend to realize Tone 4 with a rising contour, while others have a high level realization. In all speakers a sequence of two Tone 4 syllables will typically have a rising tone on the first syllable, then a high level tone on the second.

The level of Tone 2 can vary quite a bit depending on the tone that precedes it. When following one of the falling tones, it will typically stay at the level that the falling tone ended at, meaning that it will be lower than when realized by itself, and lower when following Tone 3 than

when following Tone 1. Syllables with Tone 2 also tend to be realized a bit lower when they are preceded by a minor syllable than when they are pronounced in isolation.

When two syllables with Tone 1 follow each other, the fall of the second syllable will typically start a bit lower than the fall of the first syllable. When two Tone 3 syllables follow each other, the fall of the second syllable will likewise start at a lower point than the first syllable. In a sequence of Tone 1 + Tone 3, the Tone 1 is typically realized a bit lower and the Tone 3 a bit higher than in isolation.

All of these adjustments are easily explained as ways to facilitate the transition from one tone to the next for the speaker, bringing the starting point of the tone closer to the end point of the previous tone.

4.2 The two sandhi rules

There are also contexts where a syllable will change its tone from one category to another. This can for the most part be explained with reference to two sandhi rules. However, as will be explored further below, there are exceptions to these rules that are hard to explain in terms of phonological context. The first rule relates to Tone 1 and Tone 2 when following a syllable of Tone 2, in which case they become Tone 4, and the second relates to syllables of Tone 1 following syllables of Tone 3, which become Tone 2.

Sandhi Rule 1: $\begin{bmatrix} \text{Tone 1} \\ \text{Tone 2} \end{bmatrix} \rightarrow \text{Tone 4 / Tone 2\_}$

Sandhi Rule 2: Tone 1 → Tone 2 / Tone 3_

A good indication that the tonal category has really been changed, is that we get certain constructions where words that have contrasting tones in isolation, get the same tone, and become homonymous. This will be explored in section 4.4 and 4.5. The sandhi rules apply only word internally, and sequences of Tone 2 + Tone 1, Tone 2 + Tone 2 or Tone 3 + Tone 1 are possible when they occur across word boundaries, as illustrated in (5), and it therefore seems like tone sandhi can be a good indicator of wordhood.

(5) *ŋəi₁ waː₂ phaː₁-maː₁*
1SG axe search.for-no.longer
'I no longer search for the axe.'

4.3 Tone sandhi in compounds

The tone sandhi rules can perhaps be best illustrated by looking at compounds. (6) – (9) below show compounds with all the 16 different combinations of tones, and the three cases where tone sandhi occurs are marked in bold face.

(6) *a. waː₁* 'chicken' + *ən₁* 'curry' → *waː₁ən₁* 'chicken curry'
b. ən₁ 'curry' + *haː₂* 'piece' → *ən₁haː₂* 'a piece of meat or vegetable in curry'
c. waː₁ 'chicken' + *bun₃* 'hut' → *waː₁bun₃* 'chicken hut'
d. ui₁ 'dog' + *tʰoŋ₄* 'bag' → *ui₁tʰoŋ₄* 'a bag for carrying a dog'

(7) ***a. ɾəm$_2$ ´land, wilderness, forest´ + wa:$_1$ ´chicken´ → ɾəm$_2$wa:$_4$ ´bird´***
b. wa:$_2$ ´axe´ + səŋ$_2$ ´blade´ → wa:$_2$səŋ$_4$ ´axe blade'
c. həl$_2$ ´cattle´ + bun$_3$ ´hut´ → həl$_2$bun$_3$ ´cattle hut´
d. həl$_2$ ´cattle´ + ʧa:ŋ$_4$ ´trap´ → həl$_2$ʧa:ŋ$_4$ ´cattle trap´

(8) ***a. pa:ɾ$_3$ ´flower´ + ʧim$_1$ ´house´ → pa:ɾ$_3$tsim$_2$ ´flower house´***
b. pa:ɾ$_3$ ´flower´ + səŋ$_2$ ´blade´ → pa:ɾ$_3$səŋ$_2$ ´petal´
c. nu$_3$ ´wife´ + na:$_3$ ´come from behind´ → nu$_3$na:$_3$ ´subsequent wife, i.e. second or third wife´
d. pa:ɾ$_3$ ´flower´ + t^{h}oŋ$_4$ ´bag´ → pa:ɾ$_3$t^{h}oŋ$_4$ ´flower bag´

(9) *a. ʧa:ŋ$_4$ ´trap´ + ɾui$_1$ ´string´ → ʧa:ŋ$_4$ɾui$_1$ ´the string of a trap´*
b. ʧo:m$_4$ ´cork´ + khu$_2$ ´cell´ → ʧo:m$_4$khu$_2$ ´cork cell'
c. nu$_4$ ´mother´ + na:$_3$ ´come from behind´ → nu$_4$na:$_3$ ´step mother´
d. nu$_4$ ´mother´ + pa:$_4$ ´father´ → nu$_4$pa:$_4$ ´parents´

There are some copulative pronouns relating to kinship which unexpectedly do not follow the sandhi rules. Some examples are given in (10), where in the first example sandhi rule 2 is expected to occur, but it does not, and in the other two a Tone 4 has unexpectedly become a Tone 1. In other cases, the sandhi rules apply as expected, as seen in (11). As will be seen in Section 4.4 other kinship words, namely the words for "mother" and "father" also behave unexpectedly with regards to tone sandhi.

(10) *a. nu$_3$ ´wife´ + san$_1$ ´husband´ → nu$_3$san$_1$ ´husband and wife'*
b. pa:$_4$ ´father´ + ʧa:$_1$ ´child´ → pa:$_1$ʧa:$_1$ ´father and child´
c. nu$_4$ ´mother´ + ʧa:$_1$ ´child´ → nu$_1$ʧa:$_1$ ´mother and child´

(11) *a. pu$_2$ ´uncle´ + ju$_1$ ´grandchild/nephew´ → pu$_2$ju$_4$ ´uncles and nephews´*
b. ju$_1$ ´grandchild/nephew´ + ʧa:$_1$ ´child´ → ju$_1$ʧa:$_1$ ´younger generations´

4.4 Possessive constructions

Uipo possessive constructions are formed by prefixing a possessive marker to the possessee noun. The possessive prefixes are listed in Table 1. As can be seen, there are three prefixes that have Tone 2, namely the prefixes for first and second person singular, and for third person plural. Because of sandhi rule 1, we then expect nouns that start with a syllable in Tone 1 or Tone 2 to change to Tone 4, and this is indeed what happens in most cases.

	SG	PL
1	kəi$_2$-	kəjəi$_4$-
2	nəi$_2$-	nəjəi$_4$-
3	ə-[3]	əjəi$_2$-

Table 1 – Possessive prefixes

[3] As this prefix consists of a minor syllable it does not have tone.

Examples (12) – (15) show the full paradigms of the possessive pronouns for the words *t͡ʃaː₁* ´child´, *t͡ʃaː₄* ´tea´, *sam₁* ´hair´ and *sam₂* ´dress, attire´. Note that when following one of the prefixes with Tone 2, i.e. first and second person singular or third person plural, the words that had Tone 1 and Tone 2 are realized with Tone 4. This means that the minimal pairs which are differentiated when the words are in isolation have become homonyms. *Kəi₂səm₄* can mean either ´my hair´ or ´my attire´, and *kəi₂t͡ʃaː₄* can mean either ´my child´ or ´my tea´.

(12) *a. kəi₂t͡ʃaː₄* ´my child´ (or ´my tea´)
b. nəi₂t͡ʃaː₄ ´your (SG) child´ (or ´your (SG) tea´)
c. ət͡ʃaː₁ ´his child´
d. kəjəi₄t͡ʃaː₁ ´our child´
e. nəjəi₄t͡ʃaː₁ ´your (PL) child´
f. əjəi₂t͡ʃaː₄ ´their child´ (or ´their tea´)

(13) *a. kəi₂t͡ʃaː₄* ´my tea´ (or ´my child´)
b. nəi₂t͡ʃaː₄ ´your (SG) tea´ (or ´your (SG) child´)
c. ət͡ʃaː₄ ´his tea´
d. kəjəi₄t͡ʃaː₄ ´our tea´
e .nəjəi₄t͡ʃaː₄ ´your (PL) tea´
f. əjəi₂t͡ʃaː₄ ´their tea´ (or ´their child)

(14) *a. kəi₂səm₄* ´my hair' (or ´my attire´)
b. nəi₂səm₄ ´your (SG) hair´ (or ´your (SG) attire´)
c. əsəm₁ ´his hair´
d. kəjəi₄səm₁ ´our hair´
e. nəjəi₄səm₁ ´your (PL) hair´
f. əjəi₂səm₄ ´their hair´ (or ´their attire´)

(15) *a. kəi₂səm₄* ´my attire´ (or ´my hair´)
b. nəi₂səm₄ ´your (SG) attire´ (or ´your (SG) hair´)
c. əsəm₂ ´his attire´
d. kəjəi₄səm₂ ´our attire´
e. nəjəi₄səm₂ ´your (PL) attire´
f. əjəi₂səm₄ ´their attire´ (or ´their hair´)

Figure 4 below illustrates this change. It shows the tone of the syllable *t͡ʃaː* from a speaker saying ´child´, ´my child´, ´tea´, and ´my tea´. The Hz values have been normalized and turned into semitones, following the method described in van Dam (2018). The figure shows that when the speaker is saying ´my child´ the tone is the same as when he is saying ´tea´ and ´my tea´, while ´child´ by itself has Tone 1.

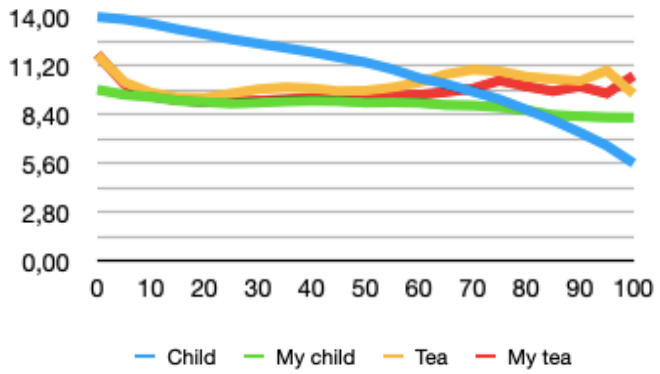

Figure 4 – The tone of the syllable *ʃa:* when a speaker is saying ´child´, ´my child´, ´tea´, and ´my tea´. The y-axis shows semitones, while the x-axis shows duration in percentage.

When a noun has more than one syllable, it is the first syllable that is relevant. If the first syllable has either Tone 1 or Tone 2, it will change to Tone 4 when the relevant prefixes are present. When the first syllable is minor, the tones do not change. An couple of examples are given in (16)–(17).

(16) *a. wa:₁jui₂* ´egg'
b. kəi₂wa:₄jui₂ ´my egg´
c. əwa:₁jui₂ ´his egg´

(17) *a. hiŋ₁ruŋ₂* ´tree'
b. kəi₂hiŋ₄ruŋ₂ ´my tree´
c. əhiŋ₁ruŋ₂ ´his tree´

While the majority of nouns do follow the sandhi rules, there are some that do not, and instead of the expected change from Tone 1 or Tone 2 to Tone 4, they keep the tone from their citation form. This leads to tonal sequences that are generally avoided elsewhere, such as Tone 2 + Tone 1 or Tone 2 + Tone 2. When there is a sequence of Tone 2 + Tone 1 the possessive marker will often be realised with a bit of a rising contour, to get to the point where the fall of Tone 1 starts. It is not clear whether this is only allophony, or whether there is actually a change in tonal category from Tone 2 to Tone 4. A couple of examples are given in (18)–(19). Note that *toŋ₁kan₂* ´cat´ has the same tonal melody as *hiŋ₁ruŋ₂* ´tree', yet the latter undergoes the sandhi rule, while the former does not.

(18) *a. toŋ₁kan₂* ´cat´
b. kəi₂toŋ₁kan₂ ´my cat´
c. ətoŋ₁kan₂ ´his cat´

(19) *a. ləi₁lik* ´book´
b. kəi₂ləi₁lik ´my book´
c. ələi₁lik ´his book´

The nouns that do not undergo the expected sandhi rule are almost all bisyllabic. In some cases, there are pairs of (near) synonymous words where one is bisyllabic and the other consists of just the first syllable of the bisyllabic word. Interestingly, there are cases where the monosyllabic words undergo the sandhi rule, while the bisyllabic words do not. This is illustrated in (20)–(23), where *naː₂t͡ʃaː₄* and *naː₂* are synonymous, as are *t͡ʃaːng₂dou₄* and *t͡ʃaːng₂*.

(20) *a.* *naː₂t͡ʃaː₄* 'younger sibling'
b. *kəi₂naː₂t͡ʃaː₄* 'my younger sibling'
c. *ənaː₂t͡ʃaː₄* 'his younger sibling'
(21) *a.* *naː₂* 'younger sibling'
b. *kəi₂naː₄* 'my younger sibling'
c. *ənaː₂* 'his younger sibling'
(22) *a.* *t͡ʃaːng₂dou₄* 'shelf'
b. *kəi₂t͡ʃaːng₂dou₄* 'my shelf'
c. *ət͡ʃaːng₂dou₄* 'his shelf'
(23) *a.* *t͡ʃaːng₂* 'shelf'
b. *kəi₂t͡ʃaːng₄* 'my shelf'
c. *ət͡ʃaːng₂* 'his shelf'

In addition to the words that consistently fail to undergo the sandhi rules in all the speakers investigated, there are also words where there is some variation. In the word *maŋ₁* 'dream' some speakers changed the tone to Tone 4 when one of the Tone 2 possessive prefixes were added, while other speakers kept the Tone 1.

Finally, the words *nu₄* 'mother' and *paː₄* 'father' behave differently from all other words I have come across, in that they have two possible tonal patterns with the possessive prefixes. Firstly, they can behave like other words with Tone 4, meaning that the tone remains the same when combined with a prefix with Tone 2. Secondly, with the singular possessive prefixes, the tones can change as illustrated in (24), where ´my mother´ has Tone 4, ´your (sg) mother´ has Tone 2, and ´his mother´ has Tone 1. For ´your (sg) mother´ the prefix itself has also changed to Tone 1. It is perhaps not surprising that the words for ´mother´ and ´father´ should behave irregularly, as they are very common words, which very often occur in possessive constructions (Bybee 2007).

(24) *nu₄* ´mother´
kəi₂nu₄ ´my mother´
nəi₁nu₂ ´your sg mother´
ənu₁ ´his mother´

4.5 Nominal attribution

Uipo has a small, closed class of true adjectives, including: *thləŋəi* 'good', *saːthi₃* 'bad', *nəsən* 'young', *əpaː* 'elderly', *tətei* 'old' and *ɾeːlhəi* 'wise, intelligent'. Other words that describe states or qualities are stative verbs. This sitation is not uncommon corss-linguistically, as discussed in Dixon (2012 ch.6). These can be used in relative constructions to modify a noun. In Uipo relative clauses

can be formed by placing the verb either before or after the noun[4], sometimes adding the suffix *-sə*. The exact function of this morpheme still needs to be investigated further, but it has to do with definiteness and specificity. Some examples are given in (25)–(26). The morpheme glossed KA is a verbal prefix that occurs on affirmative verbs in some morphological contexts but not others, and takes the form *kə-*, *kou-* or *kʰə-*, depending on the lexical item involved. The marker does not seem to contribute much semantic content, and its presence or absence is determined by other affixes on the verb.

(25) *lə-kə-tʰɐɾ* *ɦəi*
pick-KA-place fruit
'the fruit that was picked'

(26) *ɦəi* *kə-t͡ʃaː-sə*
fruit KA-eat-DEF
'the fruit that was eaten'

When a stative verb is used attributively, it can also come either before or after the noun, as illustrated in (27)–(28).

(27) *kə-ɦeːŋ₂* *hiŋ₁ruŋ₂*
KA-clean tree
´(a) clean tree´

(28) *t͡ʃim₁ kə-ɦeːŋ₂-kʰəi₄*
house KA-clean-INDEF
´a clean house´

When the verb precedes the noun, it is possible to compound the noun and the verb together. When this is done, the sandhi rules apply, as the relevant tone bearing units are now within one word. (29)–(30) illustrate how three phrases can be pronounced either as separate words, or as compounds. Note that when compounded, ´clean attire´ and ´clean hair´ are homophonous. This kind of compounding is only possible when the noun is monosyllabic.

(29) *a.* *kəɦeːŋ₂* *laː₁*
KA-clean song

b. kəheːŋ₂laː₄
KA-clean-song
'holy song'

(30) *a.* *kəɦeːŋ₂* *sam₁*
KA-clean hair

b. *kəɦeːŋ₂sam₄*
KA-clean-hair
'clean hair'

[4] More research on the frequency, distribution and and potential semantic/pragmatic differences of these two possible constructions is still needed.

(31) *a.* *kəheːŋ₂* *sam₂*
KA-clean attire
b. *kəheːŋ₂sam₄*
KA-clean-attire
'clean attire'

This construction can also be used to show that when sandhi rule 2 applies, Tone 1 really does change its tonal category. This is illustrated in the following example, where ´black axe´ and ´black chicken´ are homophonous.

(32) *a.* *waː₁* 'chicken'
b. *waː₂* ´axe´
c. *kə-məŋ₃-waː₂*
KA-black-chicken/axe
'black chicken/black axe'

4.6 Affixation

The conditions for the sandhi rules can occur word internally in morphologically complex words. When this happens, the sandhi rules mostly apply, as illustrated in (33), where the future tense suffix *-uŋ₂* changes to *–uŋ₄* following a syllable that has Tone 2.

(33) *a.* *kətʃaːuŋ₂* *'will eat'*
b. *kətʃaːuŋ₄* *'will walk'*
c. *kəsaːuŋ₂* *'will blow'*

Another example is *-kʰəi₁,* which is a marker of indefiniteness. It seems to function as a clitic, as it can attach either to a noun or to a whole noun phrase, as illustrated in (35). However, more work is needed on how to differentiate clitics and affixes in Uipo. Interestingly, when it is attached to a whole phrase, the clitic itself also gets Tone 3 when following a syllable with Tone 3, as opposed to the expected Tone 2.

(34) *a.* *ui₁kʰəi₁* ´a dog´
b. *waː₂kʰəi₄* ´an axe´
c. *bun₃kʰəi₂* ´a hut´
d. *thoŋ₄kʰəi₁* ´a bag´

(35) *a.* *tʃim₁* *kə-təŋ₁-kʰəi₁*
house KA-big-INDEF
´a big house´
b. *tsim₁* *kə-sən₂kʰəi₄*
house KA-red-INDEF
´a red house´

c. *tsim$_1$* *kə-mi$_3$-khəi$_3$*
house KA-dark-INDEF
´a dark house´

There are also some affixes that do not follow the sandhi rules, an example is *-maː$_1$* ´no longer´, which always has Tone 1, as seen in (36). Many aspects of Uipo morphology remain underdescribed, and a better understanding of this might give a fuller picture of which affixes behave in what way regarding the sandhi rules, and could perhaps shed some light on why that is.

(36) *a.* *dou$_1$maː$_1$* *'no longer new'*
b. *naː$_2$maː$_1$* *'no longer painful'*
c. *lo$_3$maː$_1$* *'no longer rich '*

4.7 Discussion

Singh (2014) describes Uipo as having three tones, which he describes as high, mid and low. Roughly speaking, his high corresponds to Tone 1, his mid to Tone 2, and his low to Tone 3, and the words that have Tone 4 are sometimes described as high, and sometimes as mid. He also describes a system of sandhi rules that is different from that presented here. His sandhi system consists of three rules: (1) open monosyllables with a high tone get a mid tone when the third person singular or first and second person plural possessive prefix is added, (2) open monosyllables with mid tone get a low tone when prefixed with the third person singular or first or second person plural possessive prefixes, and (3) closed syllables with a low tone get a high tone when prefixes with either third person singular or first or second person plural possessive prefixes.

This does not correspond to my observations. I have found that the tone changes when a word of Tone 1 or Tone 2 is prefixed with either first or second person singular, or third person plural, that is, the opposite of that reported by Singh (2014).[5] The data presented in 4.4 supports this, as it is following these prefixes that two words in a minimal pair become homonymous. I have also shown that the same sandhi rules are found throughout the language and not just in relation to the possessive prefixes.

The sandhi rules that have been described in this article (Section 4.2) support a four tone analysis of Uipo, as any Sandhi rules that do not make reference to at least four tonal categories would have to be significantly more complicated. Let us take Tone 1 as an example. In order to explain the changes seen in syllables that have Tone 1, we need to make reference to one tonal category following which the tone stays the same (Tone 4), and two where the tone changes: one triggers a low level tone (Tone 3), the other a high level or rising tone (Tone 2). Following another Tone 1, the tone also does not change, but Tone 1 and Tone 4 have to be separated on the basis that one of them change their tone following a Tone 2, while the other does not. Several examples of minimal pairs that become homophonous in certain morphophonological contexts have been presented in Section 4.4, and these show that the tonal categories of the words really do change.

[5] My understanding is that there is overlap between my consultants and Singh's consultants, so this is not likely to be a matter of dialectal differences. The fact that Singh was working with a theory of three tones might explain some of the discrepancy.

There are certain exceptions to these sandhi rules. Most notably, there are some words that do not undergo tone sandhi when following one of the Tone 2 possessive prefixes. This is quite puzzling, especially as the exceptions seem to be lexically determined. It is possible that the different behaviours of *-maː˩* and *-kʰəi˩* could be downt o the fact that one is a suffix and the other a clitic. In general, the sandhi rules behave like phonological rules, making reference to phonological contexts. However, one does not expect a phonological rule to have lexical exceptions, which seems to be the only explanation for the examples seen in (18) – (23). Hopefully further research into this issue will shed some more light on the Uipo tone system.

5 Conclusion

Uipo has four tones: one high falling, one low level, one low falling and one high level. When a Tone 1 or a Tone 2 follows a Tone 2 within the same word, they become Tone 4, and when a Tone 1 follows a Tone 3 syllable, it is realised as a Tone 2. This article has given examples of these processes and has shown some of the morphological contexts that are relevant to the sandhi rules. The article has also discussed some exceptions to the sandhi rules which seem to be lexically determined. Most importantly, it has been demonstrated that Uipo has a four tone system, rather than three, as has been proposed previously (Singh 2014).

This is an area where research is still needed. Further investigation of the morphology of Uipo will give a better idea about the tonal behaviour of various affixes, and a fuller picture might perhaps make it clear why some words and affixes fail to behave as expected.

Abbreviations

KA	A verbal prefix that occurs in some morphological contexts without having a clear meaning of its own. Takes the form kə-, kou- or kʰə-	DEF	definite
INDEF	indefinite		

References

Sæbø, Lilja Maria. (2020). Uipo Phonology. MA thesis. Department of Linguistics. Jerusalem: The Hebrew University

Butler, Becky. (2015). Approaching a phonological understanding of the sesquisyllable with phonetic evidence from Khmer and Bunong. In N. J. Enfield & Bernard Comrie (eds.), Languages of Mainland Southeast Asia: The state of the art, 443–499. Berlin/Boston: De Gruyter Mouton.

Bybee, Joan. (2007). *Frequency of use and the organization of language*. Oxford University Press.

Boersma, Paul & David Weenink. (2020). Praat: doing phonetics by computer [computer program]. http://www.praat.org/.

Dam, Kellen Parker van. (2018). The tone system of Tangsa-Nocte and related Northern Naga varieties. PhD thesis. Melbourn, Victoria: La Trobe University

Dixon, R. M. W. (2009). *Basic linguistic theory volume 2.* Oxford University Press

Hammarström, Harald, Robert Forkel, Martin Haspelmath, Sebastian Bank. (2020). Glottolog 4.2.1. Max Planck Institute for the Science of Human History. http://glottolog.org.

Singh, Laishram Bijenkumar. (2014). A descriptive grammar of Khoibu. Phd thesis. Silchar, India: Assam University

Singh, Sagolsem Indrakumar (2016). "Phonological Systems of Khoibu". The Dawn Journal 5.1.