# Northwest Sahaptin

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## 1 Introduction

Sahaptin is a Sahaptian language spoken in Washington and Oregon, U.S.A. Rigsby & Rude (1996) divide Sahaptin into three broad dialect areas: Northwest, Northeast, and Columbia River.[1] This Illustration of the IPA reflects the Yakama (also spelled Yakima)[2] subdialect (ykm) of Northwest Sahaptin. Sahaptin has fifty or fewer native speakers (Beavert & Jansen 2012). The second author is a native speaker of this dialect. Her voice is on the accompanying recordings.

Sahaptin grammars include Jacobs (1931), Rigsby & Rude (1996), and Jansen (2010). For Northwest Sahaptin in particular, Pandosy (1862) is a grammar-dictionary, Griva (no date) and Beavert & Hargus (2009) are dictionaries, and Jacobs (1929, 1934, 1937) are text collections. Jansen (2010) also includes three texts by the second author of this article.

Sahaptin and Nez Perce are the only two languages in the Sahaptian family (Aoki 1962). Sahaptian was once thought to be a branch of Plateau Penutian (Sapir 1929), along with Cayuse, Molala and Klamath. Although the Plateau Penutian hypothesis is now generally discredited, following Rigsby (1965), there is some evidence that Klamath and Sahaptian are historically related (Aoki 1963; Rude 1987, 1991; DeLancey, Genetti & Rude 1988; DeLancey 1992).

## 2 Consonants

The consonant inventory of Sahaptin is typical of languages in the Plateau linguistic area (Kinkade et al. 1998). Ejective and non-ejective stops and affricates contrast at several places of articulation.

[1] A detailed description of the historical setting of the dialects and various aspects of their relatedness can be found in Rigsby (1965). The Northwest Sahaptin dialects are Yakima, Klickitat, Kittitas, and Upper Cowlitz. The Northeast dialects are Walla Walla, Wánapam and Lower Snake R. The Columbia River dialects are Umatilla, Warm Springs, John Day and Rock Creek.
[2] See Rigsby (2009) on the etymology of this term.

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| | Bilabial | Alveolar | Post-alveolar | Palatal | Velar | Labial velar | Uvular | Labial uvular | Glottal |
|---|---|---|---|---|---|---|---|---|---|
| Plosive | p | t | | | k | $k^w$ | q | $q^w$ | ʔ |
| Affricate | | t͡s | t͡ʃ | | | | | | |
| Lateral affricate | | t͡ɬ | | | | | | | |
| Ejective stop | p’ | t’ | | | k’ | $k’^w$ | q’ | $q’^w$ | |
| Ejective affricate | | t͡s’ | t͡ʃ’ | | | | | | |
| Ejective lateral affricate | | t͡ɬ’ | | | | | | | |
| Nasal | m | n | | | | | | | |
| Fricative | | s | ʃ | | x | $x^w$ | χ | $χ^w$ | h |
| Lateral fricative | | ɬ | | | | | | | |
| Approximant | w | | | j | | | (ʁ) | | |
| Lateral approximant | | l | | | | | | | |

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**Table 1** Some phonetic characteristics of Sahaptin plosives and ejective stops (Grossblatt 1997).

| | VOT | Post-release silent period duration | f0 at vowel onset |
|---|---|---|---|
| Plosives | 38 msec | – | 211 Hz |
| Ejectives | 103 msec | 43 msec | 224 Hz |

The marginal segment [ʁ] is discussed in Section 2.2 below.

The Sahaptin plosives, though phonemically unaspirated, could be described as lightly aspirated. Grossblatt (1997) studied the pre-vocalic contrast between /p' t' k' k'$^{w}$ q' q'$^{w}$/ and their plosive counterparts in word list recordings produced by the second author. Some of his findings are shown in Table 1, where it can be seen that relative to plosives, ejectives have long VOT, a clear silent period, and elevated f0 at vowel onset. (f0 averages were calculated for this article from data provided in Grossblatt's (1997) Appendix C.) The VOT and f0 differences were significant (VOT, $p < .0001$; f0, $p = .0184$).

## 2.1 Examples

Where possible, each consonant has been illustrated before accented [a].

| IPA | | ORTHOGRAPHY[3] | GLOSS |
|---|---|---|---|
| [p] | [paˈpak'ɨnkʃa] | *papák'ɨnksha* | 'they're closing' |
| [t] | [paˈtamakʃa] | *patámaksha* | 'they're baking' |
| [k] | [paˈkaʔujʃa] | *paká'uysha* | 'they're having a ceremonial feast' |
| [k$^{w}$] | [paˈk$^{w}$iːta] | *pakwíita* | 'they're walking' |
| [q] | [paˈqaʔʃa] | *pak̲á'sha* | 'they're lying in a heap' |
| [q$^{w}$] | [paˈq$^{w}$ɨtʃa] | *pak̲wɨ́tsha* | 'they're balking' |
| [ʔ] | [paˈʔaʃa] | *pa'ásha* | 'they entered' |
| [t͡s] | [paˈt͡sasunatiʃa] | *patsásunatisha* | 'they're dragging' |
| [t͡ʃ] | [paˈt͡ʃamana] | *pachámana* | 'they went to trade' |
| [t͡ɬ] | [paˈt͡ɬupʃa] | *patɬúpsha* | 'they're jumping' |
| [p'] | [paˈp'ɨχʃa] | *pap'ɨ́x̲sha* | 'they remember' |
| [t'] | [paˈt'ipt'ipʃa] | *pat'ípt'ipsha* | 'they're hopping' |
| [k'] | [paˈk'alakʃa] | *pak'álaksha* | 'they're backpacking' |
| [k'$^{w}$] | [paˈk'$^{w}$aːnʃa] | *pakw'áansha* | 'they (people) are spoiled' |
| [q'] | [paˈq'ajuʃa] | *pak̲'áyusha* | 'they're losing weight' |
| [q'$^{w}$] | [paˈq'$^{w}$lɨmʃa] | *pak̲w'lɨ́msha* | 'they're staying awake' |
| [t͡s'] | [paˈt͡s'aːʃa] | *pats'áasha* | 'they're getting close' |
| [t͡ʃ'] | [paˈt͡ʃ'ɨʃkʃa] | *pach'ɨ́shksha* | 'they're telling a lie' |
| [t͡ɬ'] | [paˈt͡ɬ'aːkʃa] | *patɬ'áaksha* | 'they're removing layers' |
| [m] | [paˈmanaʃa] | *pamánasha* | 'they're digging roots' |
| [n] | [paˈnat͡ʃikʃa] | *panáchiksha* | 'they're bringing' |
| [s] | [paˈsamχnaʃa] | *pasámx̲nasha* | 'they're conversing' |
| [ʃ] | [paˈʃak$^{w}$tkʃa] | *pasháwtksha* | 'they're plowing' |

[3] The Yakima orthography, which was developed by a linguist (Bruce Rigsby) working with Sahaptin native speaker Alex Saluskin (step-father of the second author), represents all contrasts of the language well. In this orthography, underlining represents uvular place of articulation: i.e. ⟨x⟩ = [χ], ⟨k⟩ = [q]. The Umatilla and Warm Springs dialects (subdialects of the Columbia River dialect) use slightly different orthographies (see Rigsby & Rude 1996).

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| | | | |
|---|---|---|---|
| [x] | [pinaˈxu] | *pináxu* | ‘be overcome by emotion’ |
| [xʷ] | [paˈxʷjakʃa] | *paxwyáksha* | ‘they’re taking a sweatbath’ |
| [χ] | [paˈχasuninχa] | *paχ̲ásuninχ̲a* | ‘they’re riding around on horseback’ |
| [χʷ] | [paˈχʷnatiʃa] | *paχ̲wnátisha* | ‘they (horses) are galloping away’ |
| [h] | [paˈhajkʃa] | *paháyksha* | ‘they’re going down’ |
| [ɬ] | [paˈɬikɬikʃa] | *paɬíkɬiksha* | ‘they’re nervous, fidgety’ |
| [w] | [paˈwa] | *pawá* | ‘they are’ |
| [j] | [paˈja͡tɬʼpiʃa] | *payátɬ’pisha* | ‘they’re wet’ |
| [ʁ] | [ʔaˈqʁu] | *aq̲rú* | ‘dad’ (baby talk)[4] |
| [l] | [paˈlaʔajkʃa] | *palá’ayksha* | ‘they’re sitting and relaxing’ |

## 2.2 Low type frequency consonants

/ʁ/ has been found in only one morpheme, shown in 2.1. This sound has not been listed in any previous consonant inventory of Sahaptin.

The velar and labial velar fricatives /x xʷ/ are found in relatively few morphemes, as noted by Hargus & Beavert (2002a). However, there are a few near-minimal pairs for /x/ vs. /χ/ and /xʷ/ vs. /χʷ/:

| | | | |
|---|---|---|---|
| x | [ʔɨˈlux] | *ɨlúx* | ‘willing’ |
| χ | [ʔɨˈsuχ] | *ɨsúχ̲* | ‘roe’ |
| xʷ | [ʔaˈtʼxʷi] | *at’xwí* | ‘sneeze’ (V)[5] |
| χʷ | [ˈlatʼχʷi] | *lát’χ̲wi* | ‘popped, exploded’ |

## 2.3 Secondary articulations

As seen in the Consonant table above, labialization is considered a secondary articulation of velars and uvulars. The labial dorsals are analyzed as unit phonemes because like the plain velars and uvulars, they can occur in word-final position:

| | | |
|---|---|---|
| [ˈtkʼʷiːkʷ] | *tkw’íikw* | ‘straight’ |
| compare [ʔawkuˈniːk] | *awkuníik* | ‘stationary’ |
| [tʼɨqʷˈtʼɨqʷ] | *t’ɨk̲wt’ɨk̲w* | ‘dotted, spotted’ |
| compare [͡tɬʼaːq] | *tɬ’áak̲* | ‘broken’ |

No other consonants can precede [w] in word-final position.

Labial dorsals pattern with dorsals in word-initial position. Both can be directly followed by a consonant:

| | | |
|---|---|---|
| [ˈkʷtɨnk] | *kwtɨ́nk* | ‘that kind’ |
| [ˈkʷnak] | *kwnák* | ‘there, in that place’ |
| [ˈktɨχknik] | *ktɨχ̲knik* | ‘beside’ |
| [ˈqnɨp] | *k̲nɨ́p* | ‘be gluttonous’ |

In contrast, word-initial [w] cannot be followed directly by any consonant except [j] (see Section 2.5 below), but instead undergoes ɨ-epenthesis in this context:

| | | |
|---|---|---|
| [wɨˈnɨp] | *wɨnɨ́p* | ‘take, receive’ |
| [wɨˈtʼu-] | *wɨt’ú-* | ‘extremely, too’ |

As the second member of a word-initial cluster, [w] must be followed by a vowel, not a consonant, unlike the labial component of a labial dorsal.

[4] See Beavert & Hargus (2009) for other examples of baby talk lexicon.

[5] Morpheme glosses used in this article which cannot be found in the Leipzig Glossing Rules are: GER = gerund, INV = inverse, INV.ERG = inverse ergative, MAL.AGT = malevolent agent, PPL = participle, RED = reduplicant. For a definition of the category inverse, see Rigsby & Rude (1996).

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[ˈtwa] *twá* ‘pole’
[ˈtwin] *twín* ‘tail’

### 2.4 Contextually limited contrasts

Contrasts between [ʔ] and Ø occur only word-internally and (somewhat rarely) word-finally:

| | | |
|---|---|---|
| [ˈʔajʔaj] | *áy’ay* | ‘magpie’ |
| [ˈʔaja] | *áya* | ‘spawn’ (V) |
| [ˈpaʔjuk] | *pá’yuk* | ‘nudge, poke’ |
| [ˈpaju] | *páyu* | ‘very; sick, hurt’ |
| [ˈt͡ʃuʔ] | *chú’* | ‘suddenly quiet’ |
| [ˈt͡ʃu] | *chú* | ‘here, take it’ |

Word-initially, [ʔ] is predictable before a vowel, as in [ʔiˈtʼɨχʷtʼχʷʃa] ‘it’s raining’ (/iˈtʼɨχʷtʼχʷʃa/).[6]

Contrasts between the voiceless unaspirated plosives and ejectives occur mainly before vowels or sonorant consonants:

| | | |
|---|---|---|
| [ˈpaku] | *páku* | ‘have sex’ |
| [ˈpakʼu] | *pák’u* | ‘council’ |
| [ˈtɨχ] | *tɨ́x̲* | ‘tingly’ |
| [ˈtʼɨχ] | *t’ɨ́x̲* | ‘shiny, sparkly’ |
| [ˈkliːwi] | *klíiwi* | ‘favor (injury)’ |
| [ˈkʼlini] | *k’líni* | ‘bent’ |
| [ˈt͡ʃmuk] | *chmúk* | ‘black’ |
| [ˈt͡ʃʼmɨt] | *ch’mɨ́t* | ‘red elderberry’ |

However, some contrasts are found before obstruents:

| | | |
|---|---|---|
| [ˈkpajlk] | *kpáylk* | ‘recent’ |
| [ˈkʼpaːs] | *k’páas* | ‘cooled off’ |
| [ˈktɨχknik] | *ktɨ́x̲knik* | ‘beside’ |
| [ˈkʼtɨt] | *k’tɨ́t* | ‘hard, solid’ |
| [ˈwɨtk] | *wɨ́tk* | ‘half’ |
| [wɨtʼkˈwɨtʼk] | *wɨt’kwɨ́t’k* | ‘nod’ (V) |
| [ˈpɨtχanuk] | *pɨ́tx̲anuk* | ‘put (PL) underneath’ |
| [ˈpɨtʼχanuk] | *pɨ́t’x̲anuk* | ‘mountainous country’ |
| [ˈpaqʷtk] | *pák̲wtk* | ‘plug in’ |
| [ˈnuqʼʷk] | *núk̲w’k* | ‘swallow’ (V) |

Even more rarely, contrasts also occur word-finally. All examples of word-final ejectives are found in onomatopoetic words:

| | | |
|---|---|---|
| [ˈpʼaːq] | *p’áak̲* | ‘burst open, deflated’ |
| [huqʼˈhuqʼ] | *huk̲’húk̲’* | ‘pig’ |
| [jiqˈjiq] | *yik̲yík̲* | (creaky sound) |
| [jiqʼˈjiqʼ] | *yik̲’yík̲’* | (especially creaky sound) |

[6] Sentence-medially, word-initial [ʔ] is not always present before a vowel. We suspect that the appropriate domain for [ʔ] insertion is some kind of phrase, not word. The transcription of all sentences in this article, including the narrative, contain word-initial glottal stop before a vowel only if phonetically present in the accompanying recording.

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**Table 2** Pronunciation of underlying sequences of consonants.

| | | $C_2 \rightarrow$ | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Plosive | Affricate | Ejective stop | Ejective affricate | Nasal | Fricative | Lateral approximant | Semi-vowel |
| $C_1 \downarrow$ | Plosive | | | | | | | | |
| | Affricate | | | | | | | | |
| | Ejective stop | | | | | | | | |
| | Ejective affricate | | | | | | | | |
| | Nasal | [ɨ] | | [ɨ] | | [ɨ] | [ɨ] | [ɨ] | [ɨ] |
| | Fricative | | | | | | | | |
| | Lateral approximant | | | | | [ɨ] | | | [ɨ] |
| | Semi-vowel | [ɨ] | | [ɨ] | [ɨ] | [ɨ] | [ɨ] | | |

Key to cells:

phonetic consonant sequence

no example

[ɨ] [ɨ] required

[ɨ] additional conditions determine [ɨ]

## 2.5 Phonotactics

The Sahaptin syllable requires an onset consonant and permits both onset and coda clusters. As noted by Rigsby & Rude (1996: 671), 'the clustering of consonants shows few restrictions and is common'. In Hargus & Beavert (2002b), we suggested that word-internal consonant clusters are generally limited to two consonants. Longer sequences can occur at word edges.

Word-initial clusters distinguish Sahaptin even from its closest relative Nez Perce, which disallows word-initial consonant clusters. Restrictions on consonant sequences were discussed and exemplified in Hargus & Beavert (2002b), a qualitative acoustic study, where we suggested that unstressed [ɨ] is inserted to break up certain kinds of clusters.[7] This inserted [ɨ] is predictable from the length of the cluster and the major classes of segments which comprise the cluster. Further discussion of properties of onset and coda clusters, including place restrictions within onset but not coda clusters, can also be found in Hargus & Beavert (2002b).

Some of the properties of bisegmental word-initial clusters are described and exemplified in this section. First, a summary is provided in Table 2, which uses a slight expansion of the rows of the Consonant table above. (Note that the sequence semi-vowel + lateral approximant occurs in a trisegmental, but not bisegmental, initial cluster.)

Examples of bisegmental clusters (without epenthetic [ɨ]) are provided next. All examples in this section are monomorphemic unless otherwise indicated.

| | | | |
|---|---|---|---|
| plosive + plosive[8] | [ˈtpiːn] | *tpíin* | 'smooth' |
| plosive + affricate | [ˈpt͡ʃɨʃ] | *pchɨ́sh* | 'door' |

[7] Initial clusters were further discussed in Hargus & Beavert (2006b), where it was proposed that they can satisfy a lexical minimality requirement.

[8] In word-initial sequences of identical plosives, the initial plosive is always released:

| | | |
|---|---|---|
| [ˈppaːw] | *ppáaw* | 'gopher snake' |
| [ˈttuːʃ] | *ttúush* | 'some' |
| [qqaˈnajwi] | *kkanáywi* | 'be busy' |

Because of the obligatory release, it seems more appropriate to transcribe such sequences [pp], etc. than [pː].

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| | | | |
|---|---|---|---|
| plosive + ejective stop | [ˈpt’iniks] | *pt’íniks* | ‘girl’ |
| plosive + ejective affricate | [ˈpt͡ʃ’i] | *pch’í* | ‘rich’ |
| plosive + nasal | [ˈqniːp] | *k̲níip* | ‘improper’ |
| plosive + fricative | [ˈpsa] | *psá* | ‘bark, husk, hull’ |
| plosive + lateral approximant | [ˈkʷlaː] | *kwláa* | ‘slight’ |
| plosive + semi-vowel | [ˈkjaːk] | *kyáak* | ‘neat, tidy’ |
| affricate + plosive | [ˈt͡ɬqʷɨt] | *tɬ̲kwɨ́t* | ‘snatch, grab’ |
| affricate + affricate[9] | [ˈt͡ʃt͡ʃaja] | *chcháya* | ‘juneberry’ (*Amelanchier alnifolia*) |
| affricate + nasal | [ˈt͡snits] | *tsníts* | ‘your (man’s) younger sister, female cousin’ |
| affricate + fricative | [ˈt͡ʃχaːw] | *ch̲x̲áaw* | ‘fat’ (ADJ) |
| affricate + lateral approximant | [ˈt͡ʃlɨt] | *chlɨ́t* | ‘cataract’ |
| affricate + semi-vowel | [t͡ʃjaˈwaw] | *chyawáw* | ‘bad’ |
| ejective stop + plosive | [ˈk’puːɬ] | *k’púuɬ* | ‘short’ |
| ejective stop + nasal | [ˈq’muːʃ] | *k̲’múush* | ‘wrinkled’ |
| ejective stop + fricative | [ˈq’ʃaːʃ] | *k̲’sháash* | ‘curly’ |
| ejective stop + lateral approximant | [ˈq’luni] | *k̲’lúni* | ‘bald’ |
| ejective stop + semi-vowel | [ˈq’jaʃ] | *k̲’yásh* | ‘buttocks’ |
| ejective affricate + plosive | [ˈt͡s’pɨs] | *ts’pɨ́s* | ‘release’ (V) |
| ejective affricate + ejective affricate[10] | [ˈt͡ɬ’t͡ɬ’uːmχ] | *tɬ’tɬ’úumx̲* | ‘redwing blackbird’ |
| ejective affricate + nasal | [ˈt͡s’mɨst] | *ts’mɨ́st* | ‘nine’ |
| ejective affricate + fricative | [ˈt͡s’xʷiː] | *ts’xwíi* | ‘conical’ |
| ejective affricate + lateral approximant | [ˈt͡ʃ’laj] | *ch’láy* | ‘pulverized salmon mixed with steelhead oil’ |
| ejective affricate + semi-vowel | [ˈt͡s’waːj] | *ts’wáay* | ‘straight, true’ |
| nasal + affricate | [ˈnt͡ʃiwi] | *nchíwi* | ‘disagree about, fight over’ |
| nasal + ejective affricate | [ˈnt͡ʃ’i] | *nch’í* | ‘big, old’ |
| fricative + plosive | [ˈχtu] | *x̲tú* | ‘strong’ |
| fricative + affricate | [ˈʃt͡ʃapa] | *shchápa* | ‘rosehip’ |
| fricative + ejective stop | [ˈɬkʷ’i] | *ɬkw’í* | ‘day’ |
| fricative + ejective affricate | [ˈst͡s’at] | *sts’át* | ‘night’ |
| fricative + nasal | [ˈχni] | *x̲ní* | ‘dig’ |
| fricative + fricative | [ˈsχɨχ] | *sx̲ɨ́x̲* | ‘be angry’ |
| fricative + lateral approximant | [ˈχli] | *x̲lí* | ‘print (fabric)’ |
| fricative + semi-vowel | [ˈʃwat’aʃ] | *shwát’ash* | ‘cloud’ |
| lateral approximant + plosive | [ˈltajltaj] | *ltáyltay* | ‘woven shoulder bag’ |
| lateral approximant + ejective stop | [ˈlkʷ’i] | *lkw’í* | ‘overwhelm’ |

[9] Only sequences of identical affricates occur. Because the transcription [t͡ɬː] is ambiguous (it could represent [tːɬ] or [tɬː]), we transcribe such sequences [t͡ɬt͡ɬ].

[10] In the two attested examples of this pattern, the ejective affricates are identical. The other example is [ˈt͡s’t͡s’uːp] ‘friable’.

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| | | | |
|---|---|---|---|
| lateral approximant + ejective affricate | [ˈl͡tʃ’i] | *lch’í* | ‘big, old’ (DIM)[11] |
| semi-vowel + semi-vowel[12] | [ˈwjanawi] | *wyánawi* | ‘arrive’ |

The cells in Table 2 which surface with [ɨ] between the two consonants and those which surface as is (without [ɨ]) are in complementary distribution. For this reason, we treat [CɨC] as underlyingly /CC/. Examples of these underlying bisegmental clusters which consistently surface with epenthetic [ɨ] are provided next:

| | | | |
|---|---|---|---|
| nasal + nasal | [nɨˈmuj] | *nɨmúy* | ‘miscarry’ |
| nasal + fricative | [mɨˈsaː] | *mɨsáa* | ‘funny, comical’ |
| nasal + lateral approximant | [mɨˈlaːm] | *mɨláam* | ‘how many times?’ |
| lateral approximant + nasal | [lɨˈmɨslɨmɨs] | *lɨmɨslɨmɨs* | ‘thick buckskin’ |
| lateral approximant + semi-vowel | [lɨˈwaːjs] | *lɨwáays* | ‘lucky’ |
| semi-vowel + plosive | [jɨˈqʷiːt] | *yɨk̲wíit* | ‘narrow’ |
| semi-vowel + ejective stop | [jɨˈqʼʷɨl] | *yɨk̲wʼɨ́l* | ‘muddy’ |
| semi-vowel + ejective affricate | [wɨˈt͡tʼɨt] | *wɨtɬʼɨ́t* | ‘glans’ |
| semi-vowel + nasal | [wɨˈnɨp] | *wɨnɨ́p* | ‘take’ |
| semi-vowel + fricative | [wɨˈχa] | *wɨx̲á* | ‘leg, foot’ |

In the three contexts of Table 2 where some cells surface with or without epenthetic [ɨ], the first consonant is always nasal. Two further generalizations are possible, maintaining the predictability of [ɨ] in such clusters:

(i) When the second consonant is the semi-vowel [j], there is no ɨ-epenthesis. The following sequences occur:

| | j | w |
|---|---|---|
| m | mj | |
| n | nj | nɨw |

| | | |
|---|---|---|
| [ˈmjanaʃ] | *myánash* | ‘child’ |
| [ˈnjat͡ʃ] | *nyách* | ‘pants’ |
| [nɨˈwit] | *nɨwít* | ‘immediately’ |

(ii) Otherwise, when the initial nasal is [m], then ɨ-epenthesis always occurs. However, [n] surfaces in sequence with the following consonant, except when the following consonant is a labial dorsal:

| | p | p’ | t | t’ | k | kʷ | q | q’ | q’ʷ |
|---|---|---|---|---|---|---|---|---|---|
| m | | | mɨt | mɨt’ | | | mɨq | mɨq’ | |
| n | np | np’ | nt | | nk | nɨkʷ | | | nɨq’ʷ |

| | | |
|---|---|---|
| [ˈnpaʃa] | *npásha* | ‘repossess’ |
| [ˈntiχt] | *ntix̲t* | ‘diaper’ |
| [ˈnkaʃtk] | *nkáshtk* | ‘tie’ (V) |
| [nɨˈkʷɨt] | *nɨkwɨ́t* | ‘meat’ |
| [mɨˈtiːt] | *mɨtíit* | ‘damp’ |

[11] From [ˈn͡tʃ’i] ‘big’, with [n] > [l] (diminutive consonant symbolism).
[12] Only [wj] is attested. Neither [jw] nor [jɨw] occurs.

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| | | |
|---|---|---|
| [mɨˈqɨɬ] | *mɨk̲íɬ* | 'orange' |
| [mɨˈtʼɨp] | *mɨtʼíp* | 'elderberry' |
| [ˈnpʼiwi] | *npʼíwi* | 'fish' (V) |
| [nɨˈqʷʼɨt] | *nɨk̲wʼít* | 'breast, breast milk' |

Here we see that the labial dorsals, although single consonants with respect to word final distribution and some aspects of word-initial distribution (§2), behave like consonant sequences in other ways in initial clusters. In longer initial clusters, ɨ-epenthesis is more frequent. Compare /ʃm/ followed by a vowel in [ˈʃmatʼa] *shmátʼa* 'wash face' vs. /ʃm/ followed by a consonant in [ʃɨmˈtaj] *shɨmtáy* 'pubic hair'. See Hargus & Beavert (2002b) for further examples of ɨ-epenthesis in triconsonantal and longer clusters.

Turning briefly to the laryngeal consonants, [h] does not occur in clusters. [ʔ] may occur as the first consonant in a cluster, where it is always followed by [ɨ]:

| | | | |
|---|---|---|---|
| ʔ + plosive | [ʔɨˈpap] | *ɨpáp* | 'hand, arm' |
| ʔ + ejective stop | [ʔɨˈpʼuːs] | *ɨpʼúus* | 'cat' |
| ʔ + nasal | [ʔɨˈniːt] | *ɨníit* | 'house' |
| ʔ + fricative | [ʔɨˈsip] | *ɨsíp* | 'woman's younger sister or younger female cousin' |
| ʔ + lateral approximant | [ʔɨˈlɨχ] | *ɨlɬx̲* | 'lots' |
| ʔ + semi-vowel | [ʔɨˈwinʃ] | *ɨwínsh* | 'man' |

For further details on initial and final clusters, see Hargus & Beavert (2002b).

## 3 Vowels

### 3.1 Vowel quality contrasts

There are four contrasting vowel qualities, all found root-internally:

| | | | |
|---|---|---|---|
| [i] | [laˈtit] | *latít* | 'flower, bloom' |
| | | < *latí* 'bloom' (V) + *-t* GER | |
| [u] | [ˈtutanik] | *tútanik* | 'hair' |
| [ɨ] | [ʔɨˈtɨt] | *ɨtɨt* | 'tooth' |
| [a] | [paˈtatpatat] | *patátpatat* | 'trees, trunks' |
| | | < *pátat* 'tree, trunk' + RED PL | |
| | | < *páta-* 'be rooted to' | |

Although [ɨ] occurs root-internally like the other vowels, the distribution of [ɨ] differs from that of the other vowels in certain ways. [ɨ] does not occur root- or word-finally, is the only vowel with no long counterpart (3.3), and does not occur before semi-vowels (3.4) except in initial clusters (3.3).

### 3.2 Spectral properties

An acoustic chart of the four contrasting vowel qualities of Sahaptin is shown in Figure 1 below. This figure is based on measurements of the words in Table 3 (ten tokens per quality).

Comparing Figure 1 with the IPA vowel chart, [ɐ] would be a more accurate symbol for the low vowel than [a] in a narrow transcription, since the second formant of the low vowel is

**Table 3** Means and standard deviations (in parentheses) of F1 and F2.

| Vowel | Words | | | F1 (Hz) | F2 (Hz) |
|---|---|---|---|---|---|
| [i] | [ˈpipʃ] | *pípsh* | 'bone' | 380 (26.4) | 2610 (51.2) |
| [u] | [ˈpupx] | *púpx* | 'blow air' | 397 (28.9) | 1006 (52.9) |
| | [ʔiˈpupxa] | *ipúpxa* | '(3SG) blew air' | | |
| [a] | [ˈpap] | *páp* | 'man's daughter' | 720 (25.0) | 1474 (38.8) |
| [ɨ] | [ˈkʼpɨt] | *kʼpít* | 'bead' | 476 (25.7) | 1785 (106.1) |
| | [ˈkʼpɨs] | *kʼpís* | 'cold' | | |

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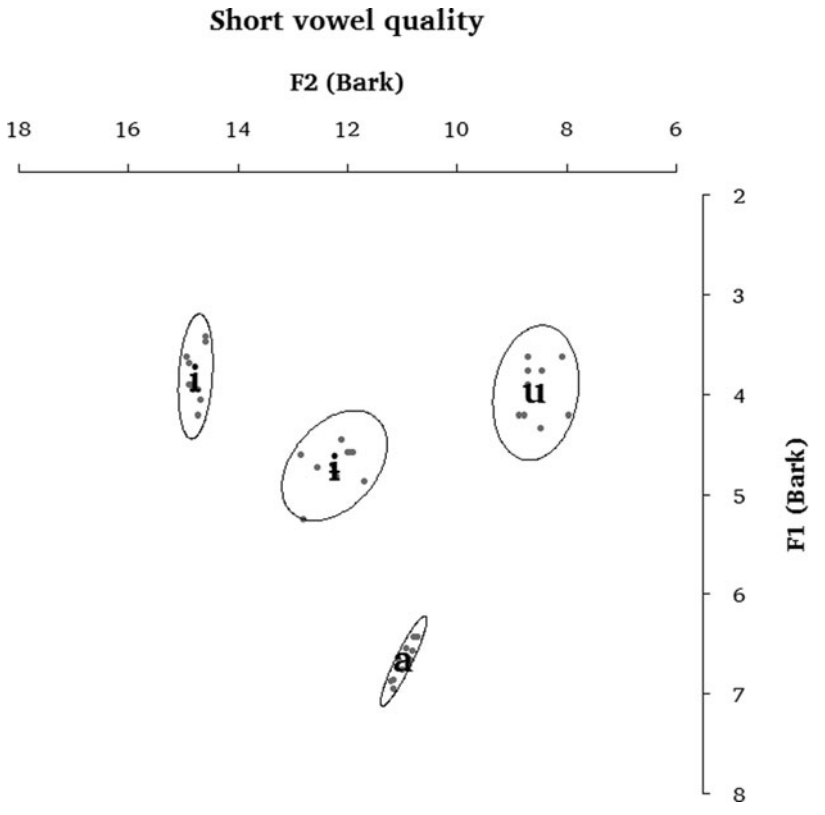


**Figure 1** F1 × F2 plot of short vowels (tokens, means and 95% confidence intervals).

intermediate between that of back [u] and central [ɨ]. In the broader transcription used in this Illustration, the symbol [a] is used to show parallelism between the short and long vowels: each peripheral vowel has a long counterpart (3.3).

The vowel [ɨ] was transcribed [ə] by Jacobs (1931). However, following Rigsby (1965), we use [ɨ] for this vowel. As can be seen in Figure 1, this vowel is relatively close in F1 to [i] and [u], although in the sample plotted in Figure 1, [i] and [u] each has significantly lower F1 than that of [ɨ] (by the Bonferroni Dunn *post hoc* test). A more accurate symbol for the central vowel might therefore be [ɘ] or perhaps [ɵ]. In support of our broad transcription of this vowel as [ɨ], we note that [ɨ] patterns with [i u] rather than [a] in undergoing Destressed High Vowel Deletion (Hargus & Beavert 2002b). When accent (4.1) shifts leftward (as when an accented prefix is added to an accented root, when a root is reduplicated, and in some compounds), the root accent is deleted. When [i u] are adjacent to a homorganic glide within a root, these vowels are deleted when deaccented:

| | | |
|---|---|---|
| [ʔaˈjik] | *ayík* | ‘sit’ |
| [ˈlaʔajk] | *lá’ayk*<br>< *lá-* ‘leisurely, taking one’s time’<br>+ *ayík* ‘sit’ | ‘sit relaxed’ |
| [ˈpuwa] | *púwa* | ‘place in cradleboard’ |
| [ˈʔapwak ˈmjalasnan] | *ápwak myálasnan*<br>< *á-* ABS + *púwa* ‘place in cradleboard’ + *-k* IMP | ‘place the baby in the cradleboard’ |

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Like the other high vowels, [ɨ] also deletes when deaccented (and followed by one or more obstruents):[13]

| | | |
|---|---|---|
| [ʔaˈpɨɬ] | *apɨ́ɬ* | 'leaf' |
| [ʔaˈpɨɬʔapɬ] | *apɨ́ɬ'apɬ* | 'leaves' |
| [ʔɨʃˈt͡ʃɨt] | *ɨshchɨ́t* | 'trail, road' |
| [ʔaˈsumʔɨʃt͡ʃt] | *Asúm ɨshcht* | 'Eel Trail' |

Although the contexts for unstressed /i u/ deletion vs. unstressed /ɨ/ deletion are different, note that [a] does not delete in any context. Compare the retention of [a] in 'ring it' with the deletion of [ɨ] in 'Eel Trail':

| | | |
|---|---|---|
| [ˈt͡ʃatik] | *chátik* | 'ring (bell)' |
| [ˈʔat͡ʃatik] | *áchatik*, **áchtik* | 'ring it (bell)' |

### 3.3 Vowel length

As noted above, all vowel qualities but [ɨ] can occur long or short.

| | | | |
|---|---|---|---|
| [a] | [ˈst͡sʼat] | *stsʼát* | 'night' |
| [aː] | [ˈst͡sʼaːt] | *stsʼáat* | 'dark' |
| [i] | [ˈpipʃ] | *pípsh* | 'bone' |
| [iː] | [ˈt͡ɬʼpiːp] | *tɬʼpíip* | 'wing dress' |
| [u] | [ˈtun] | *túnˈ* | 'what' |
| [uː] | [ˈtuːn] | *túun* | 'what' (ACC) |

Rigsby & Rude (1996: 667) describe [ɨ] as 'invariably shorter in duration than the other short vowels'. One- or two-syllable words containing the second author's seven contrastive vowels in closed syllables were recorded in isolation and also in a sentence frame. Average durations and standard deviations for the seven contrastive vowels of Sahaptin are shown in Figure 2. This figure is based on measurements of the vowels of interest in the words (four repetitions per word) in Table 4.

Across both contexts, the average duration for [ɨ] is 68 msec, for short vowels [i a u] 128 msec, and for long vowels [iː aː uː] 354 msec. *Post hoc* analysis (Bonferroni Dunn) showed that [ɨ] was significantly shorter than each of [i a u], thus confirming Rigsby and Rude's

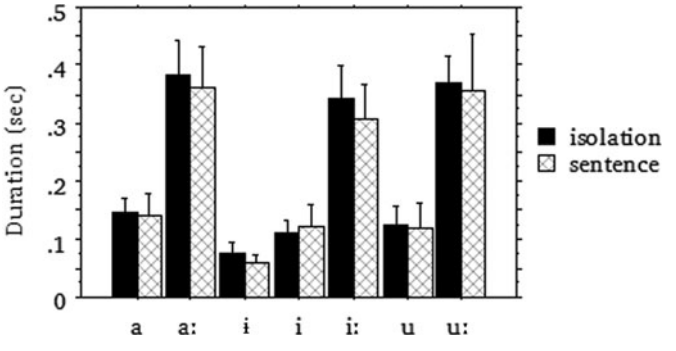


**Figure 2** Vowel durations (averages and standard deviations) in two contexts.

[13] Jacobs (1931: 101) also observed this for [ɨ] (his [ə]): 'the obscure vowel, ə, when surrounded by surds in an unaccented syllable, frequently loses sonancy or even disappears acoustically'.

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**Table 4** Means and standard deviations (in parentheses) for vowel duration in two contexts.

| | | Duration (msec) | |
|---|---|---|---|
| Vowel | Words | Isolation | Sentence |
| [i] | [laˈtit] *latít* 'flower', [ˈptis] *ptís* 'muskrat', [ˈχtin] *xtín* 'diaper' | 112 (21.1) | 122 (36.0) |
| [iː] | [ˈptiːt] *ptíit* 'damp', [ˈtiːʃ] *tíish* 'stink bug', [ˈtiːn] *tíin* 'person, Native American' | 342 (56.3) | 307 (59.9) |
| [u] | [ʔɨˈtut] *ɨtút* 'your father', [lamˈtus] *lamtús* 'opponent', [ˈtun] *tún* 'what' | 125 (32.2) | 121 (41.9) |
| [uː] | [ˈpuːt] *púut* 'woman's niece', [ˈttuːʃ] *ttúush* 'some', [ˈtuːn] *túun* 'what' (ACC) | 371 (44.6) | 358 (94.1) |
| [a] | [ʔɨˈkak] *ɨkák* 'your maternal uncle', [kˈaˈlas] *k'alás* 'raccoon', [ˈʔam] *ám* 'husband' | 147 (24.9) | 142 (37.9) |
| [aː] | [ˈtaːk] *táak* 'meadow', [waˈlaːs] *waláas* 'gum', [ˈʔaːn] *áan* 'sun' | 384 (59.3) | 361 (71.4) |
| [ɨ] | [ʔɨˈtɨt] *ɨtɨt* 'tooth', [ˈkˈpɨs] *k'pís* 'cold', [ˈptɨn] *ptín* 'timber' | 74 (19.7) | 60 (12.2) |

statement above. [i a u] did not differ significantly from each other in duration. Each of [i a u] was significantly shorter than each of [iː aː uː]. Of the long vowels, [iː] was significantly shorter than [aː], but there were no other significant differences in duration among the long vowels.

Jacobs (1931: 100) noted that [i u] are more 'open' than their long counterparts. Spectral analysis of short vs. long vowel qualities, in Figure 3, shows that long vowels are more peripheral in the vowel space than corresponding short vowels, although the only significant differences in F1 are between [i] and [iː], and for F2, [i] vs. [iː] and [u] vs. [uː] (Bonferroni Dunn). Figure 3 is based on measurements of the vowels of interest in the words shown in Table 5 (five repetitions per word).

### 3.4 Vowel and semi-vowel combinations

In contrast to consonant sequences, vowel sequences in Sahaptin are strictly disallowed. Tautosyllabic closing 'diphthongs' are attested, but these are arguably simply long or short vowels followed by a semi-vowel.[14] The only distributional restriction on 'diphthongs' is that in a high vowel + semi-vowel combination, the vowel and semi-vowel must be of opposing labiality. All of the vowels except [ɨ] (as noted above) can occur long or short before semi-vowels.

| | | | |
|---|---|---|---|
| [iw] | [ˈʔiwsχ] | *íwsx̲* | 'calm, make relax' |
| [iːw] | [ˈʔiːwʃ] | *íiwsh* | 'urine' |
| [aw] | [ˈwawkˈa] | *wáwkˈá* | 'get angry with, reprimand' |
| [aːw] | [ˈwaːwkˈa] | *wáawkˈa* | 'too (much)' |
| [uj] | [ʔanaˈhuj] | *anahúy* | 'black bear' |
| [uːj] | [ˈhuːj] | *húuy* | 'unable, barely able' |
| [aj] | [ˈmajsχ] | *máysx̲* | 'tomorrow' |
| [aːj] | [ˈmaːjsχ] | *máaysx̲* | 'next day' |

[14] A morphophonemic argument noted by Hargus & Beavert (2006b) for interpreting the final segment of diphthongs as consonants is that [w] and [j] pattern with other consonants in triggering the occurrence of the -[ʃ] allomorph of the 'perfect' (Rigsby & Rude 1996) suffix, in contrast to vowels, which trigger the -[a] allomorph.

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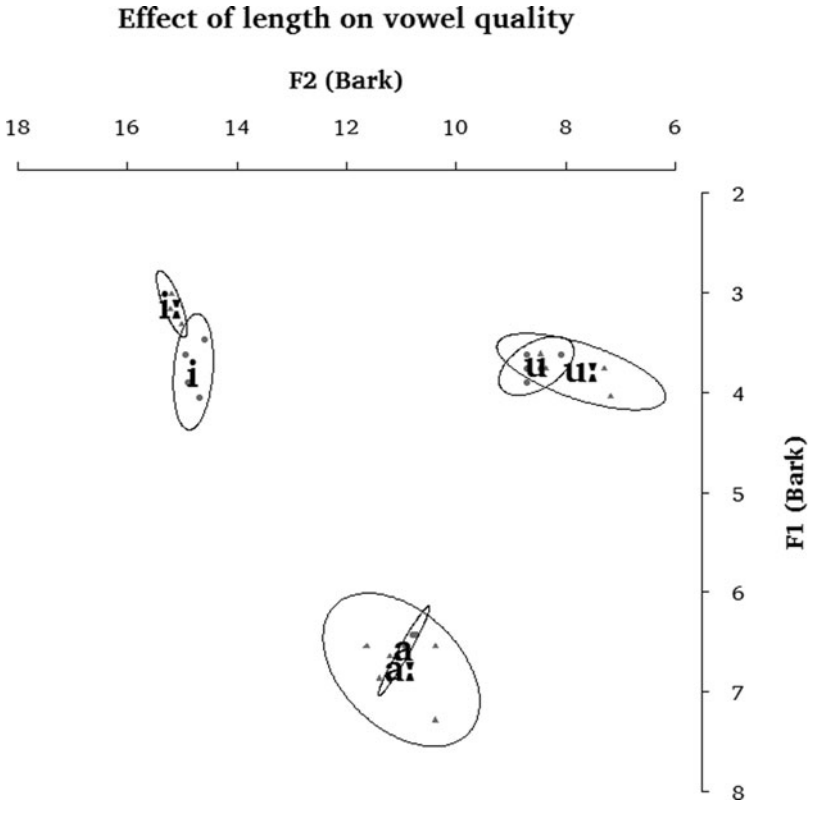


**Figure 3** F1 × F2 plot of short (non-central) vs. long vowels (tokens, means and 95% confidence intervals). Short vowel tokens are plotted with dots, and long vowels with triangles.

**Table 5** Means and standard deviations (in parentheses) of F1 and F2 for long and short vowel contrasts.

| Vowel | Word | | | F1 (Hz) | F2 (Hz) |
|---|---|---|---|---|---|
| [i] | [ˈpipʃ] | *pípsh* | 'bone' | 377 (24.6) | 2619 (59.4) |
| [a] | [ˈpap] | *páp* | 'man's daughter' | 709 (24.7) | 1468 (43.0) |
| [u] | [ʔiˈpupxa] | *ipúpxa* | '(3SG) blew air' | 371 (12.5) | 1001 (45.7) |
| [iː] | [ˈtɬʼpiːp] | *tɬʼpíip* | 'wingdress' | 308 (13.4) | 2781 (48.2) |
| [aː] | [ˈkʼpaːs] | *kʼpáas* | 'cooled off' | 736 (43.8) | 1483 (131.1) |
| [uː] | [ˈpuːʃ] | *púush* | 'juniper' | 377 (16.4) | 873 (97.6) |

Minimal and near-minimal pairs for [iw] and [ju], [wi] (or [ʷi]) and [uj] are shown next:

[iw] vs. [ju]

| | | |
|---|---|---|
| [ˈpiwtɨn] | *píwtɨn* | 'flute' |
| [ʔiˈpjutɨn] | *ipyútɨn* | '(3SG) has come out of the water' |
| [taˈmiwnaʃ] | *tamíwnash* | 'cape' |
| [paˈmjumjuʃa] | *pamyúmyusha* | 'they're mewing' |

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[wi] vs. [uj]

| | | |
|---|---|---|
| [ˈpaʃwit] | *páshwit* | ‘value’ |
| [ʃaˈpaʃujt] | *shapáshuyt* | ‘punishment’ |
| [ʔiˈqʷikt] | *ikwíkt* | ‘perfume’ |
| [ˈqujχ] | *kúyx* | ‘white’ |
| [ˈqʼʷiːt] | *kwʼíit* | ‘visible, in plain sight’ |
| [ˈqʼujχ] | *kʼúyx* | ‘long (large and elongated)’ |

Note also that [iji] contrasts with [iː]:

ˈʧijin *chíyin* ‘this (INV.ERG)’

| | | |
|---|---|---|
| ˈʧijin | ˈpajkna | paˈχʷiɬamnan |
| *chíyin* | *pá-yk-na* | *paxwíɬam-nan* |
| this.INV.ERG | INV-hear-PST | burglar-ACC |

‘this (person) heard the burglar’

ˈʧiːn *chíin* ‘this (ACC)’

| | | |
|---|---|---|
| ˈʧiːn | ˈpajkna | paˈχʷiɬamin |
| *chíin* | *pá-yk-na* | *paxwíɬam-in* |
| this.ACC | INV-hear-PST | burglar-INV.ERG |

‘the burglar heard this (person)’

[uwu], on the other hand, does not occur in Northwest Sahaptin.

## 4 Prosody

### 4.1 Lexical pitch accent

The prosodic system of Sahaptin fits the characteristics of what is usually described as pitch accent (see e.g. McCawley 1978). Sahaptin morphemes are either underlyingly accented or unaccented. Unaccented free morphemes are a small set, including function morphemes such as conjunctions [ku] ‘and’ and [uː] ‘or’:

[ˈputɨmt ku ˈtuskaːs] ‘seventeen’

| | | |
|---|---|---|
| *pútɨmt* | *ku* | *túskaas* |
| 10 | and | 7 |

[ˈmiʃ iˈtqʼiχʃa ˈtiː ʔuː ˈkupi] ‘whether (3SG) wants tea or coffee’

| | | | | |
|---|---|---|---|---|
| *mísh* | *i-tkʼíx-sha* | *tíi* | *uu* | *kúpi* |
| whether | 3SG-want-IPFV | tea | or | coffee |

Because of the existence of unaccented free morphemes, we transcribe accent on monosyllables in this article and in our other work.

Unaccented bound morphemes are more common than unaccented free morphemes. The unaccented bound morphemes include pronominal clitics:[15]

[15] Pronominal clitics have been traditionally described as second (sentential) position clitics, but in texts such pronominals occur in sentence-initial position about 2% of the time (Hargus & Beavert 2012).

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[ˈkʷjaːmnaʃ ˈnuː] ‘I’m telling the truth’

*kwyáam = nash* *núu*
truly = 1SG say.IPFV

Unaccented bound morphemes are a source of accent contrasts in polymorphemic words. Words surface with one accent.[16] As described by Hargus & Beavert (2002b, 2006a), if a word contains both an accented prefix and an accented root, the accent surfaces only on the prefix, as in [ˈmajkuːkit] ‘morning cooking’ and [ˈpaʔɨna] ‘3SG told 3SG’, the morphological decomposition of which is shown next:

[ˈ**maj**kuːkit] ‘morning cooking’

*máy-kúuki-t*
morning-cook-GER

compare [**maj**ˈkusksim] ‘more similar’

*may-kúsksim*
more-similar

[ˈtwatijin ˈ**pa**ʔɨna ˈʔaw ʔiˈt͡sʼaːʃa] ‘The doctor told (3SG) [the end] is drawing near.’

*twáti-yin* *pá-ʼɨ́n-a* *áw* *i-tsʼaa-sha*
medicine.man-INV.ERG INV-tell-PST now 3SG-draw.near-IPFV

compare [ˈtwatima **pa**ˈʔɨna ˈʔaw ʔiˈt͡sʼaːʃa] ‘The doctors said [the end] is drawing near.’

*twáti-ma* *pa-ʼɨ́n-a* *áw* *i-tsʼaa-sha*
medicine.man-PL 3PL.NOM-tell-PST now 3SG-draw.near-IPFV

(However, Hargus & Beavert 2006a noted that some roots, termed ‘strong roots’, resist the attraction of accent to a prefix.[17]) Accented suffixes either realize their accent on a vowel of the suffix (e.g. *-łá* ‘agent’) or are PRE-ACCENTED, with the accent realized on the syllable before the suffix (e.g. *-ɬ́am* ‘malevolent agent’). If a word contains both an accented suffix and an accented root, the strongest accent in the word is on the suffix, as in [paˈχʷiɬam] or [pamʃpaχʷiˈɬa]:

[paˈχʷiɬam] ‘thief, burglar’

*páx̲wi-ɬ́am*
steal-MAL.AGT

compare [ˈpaχʷi] *páx̲wi* ‘steal’

[pamʃpaχʷiˈɬa] ‘eavesdropper’

*pá-mɨshpáx̲wi-łá*
INV-eavesdrop-AGT

compare [mɨʃˈpaχʷi] *mɨshpáx̲wi* ‘eavesdrop’

[16] Rude (1988) suggested that there may be secondary stresses in Sahaptin. In the variety of Sahaptin described here, the only evidence for this is the optional occurrence of [ɨ] in contexts where it normally deletes when accent shifts rightward. See Hargus & Beavert (2002a) for examples and further discussion.

[17] An example can be found in the narrative. The root [tanaˈwiːχ] *tanawíix̲* ‘argue’ causes the accent to be lost from [ˈpapa]- *pápa-* ‘each other’, rather than the other way around.

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Minimal pairs for accent location can also be found in polysyllabic, monomorphemic roots:

| | | |
|---|---|---|
| [ˈpamta] | *pámta* | ‘woman’s brother’s son’ (VOC) |
| [pamˈta] | *pamtá* | ‘bullfrog, toad’ |
| [ˈwatwin] | *wátwin* | ‘study, observe’ |
| [waˈtwin] | *watwín* | ‘track down’ |
| [ˈkʼʷima] | *kwʼíma* | ‘in case’ |
| [kʼʷiˈma] | *kwʼimá* | ‘converse’ (V) |
| [ˈwaluː] | *wáluu* | ‘flip, shake to hang straight’ |
| [waˈluː] | *walúu* | ‘hang down’ |
| [ˈʔɨʃa] | *ɨ́sha* | ‘woman’s daughter’ (VOC) |
| [ʔɨˈʃa] | *ɨshá* | ‘lie, recline’ |

Compounding is not a common word-formation strategy in Sahaptin, but compounds are sometimes distinguishable from homophonous phrases by virtue of the fact that the compound contains only one accent:

| | | | |
|---|---|---|---|
| [ˈnt͡ʃʼiˈwana] | *nchʼí* | *wána* | ‘big river’ |
| | big | river | |
| [nt͡ʃʼiˈwana] | *Nchʼi* | *wána* | ‘Columbia River’[18] |

([ʔaˈsumʔɨʃt͡ʃt] (*Asúm ɨshcht*) ‘Eel Trail’ in 3.2 is another example of a compound with one accent.)

Jacobs (1931: 117) noted that ‘stress and high tone are one phenomenon in northern Sahaptin; they are very strongly marked in northwest Sahaptin’. Hargus & Beavert (2005) determined that the principal phonetic correlates of accent are increased pitch and energy, but not duration. Figure 4[19] shows the relative quality of accented vs. unaccented vowels. While there is a tendency for F1 to be higher for accented vowels, the effect of accent on F1 was not significant in this sample.

Jacobs (1931: 117) further noted that accented ‘short vowels have high tone’ and that ‘long vowels or diphthongs in accented syllables have falling tone, high to normal’. We have found both of these statements true of the second author’s word-final accented vowels. Figure 5 contains a word which ends in a short, accented vowel. Note the lack of pitch fall at the end of the word. In contrast, Figure 6 contains a word-final accented long vowel. Note the fall in pitch.

## 4.2 Intonation

In declarative sentences, the lowest pitch of the sentence is at its right edge if the sentence does not end in a short accented vowel, suggesting that declarative sentences are marked by an intonational low (L) boundary tone. (The word-final fall on long vowels as seen in Figure 6 can then also be considered an instance of this declarative L.) An example of the lowest pitch occurring sentence-finally is presented in Figure 7. The sentence in Figure 7 contains two lexical pitch accents, on the syllables [pʼuːs] (197 Hz) and [wi] (184 Hz). The lowest sentence-internal pitch is on the syllable [naʃ] at 154 Hz, and the pitch drops to 135 Hz at the end of the sentence.

[18] The Columbia River is the biggest river in the Sahaptin language area.

[19] The data set underlying Figure 4 consisted of six lexical tokens for each accented and unaccented vowel drawn from sound files accompanying Beavert & Hargus (2009), downsampled to 11025 Hz for analysis. The words in each comparison set were balanced for consonantal context, syllable type, and position within the word.

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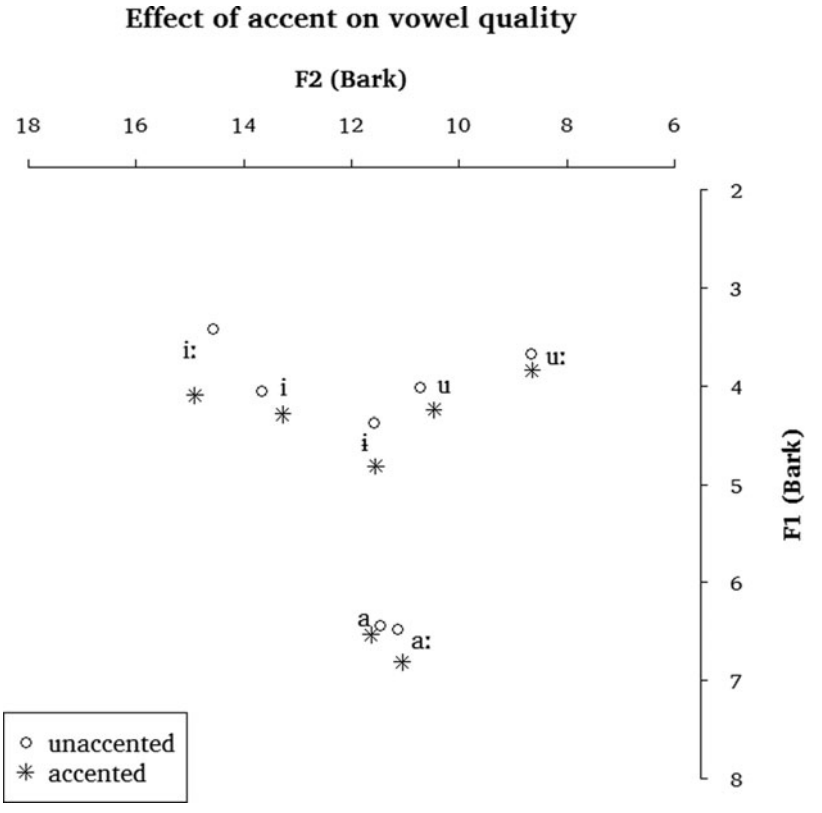


**Figure 4** F1 × F2 plot of accented vs. unaccented vowels (means).

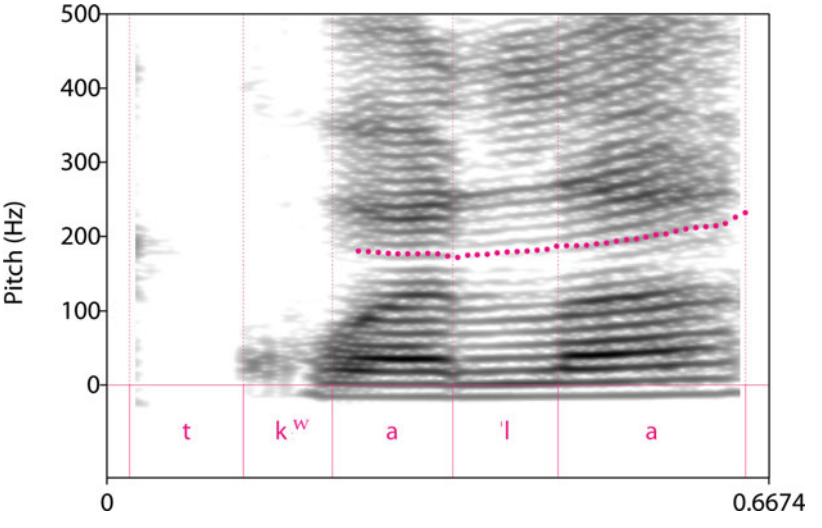


**Figure 5** (Colour online) Narrow band spectrogram and pitch track of [tkʷaˈla] *tkwalá 'freshwater fish.'*

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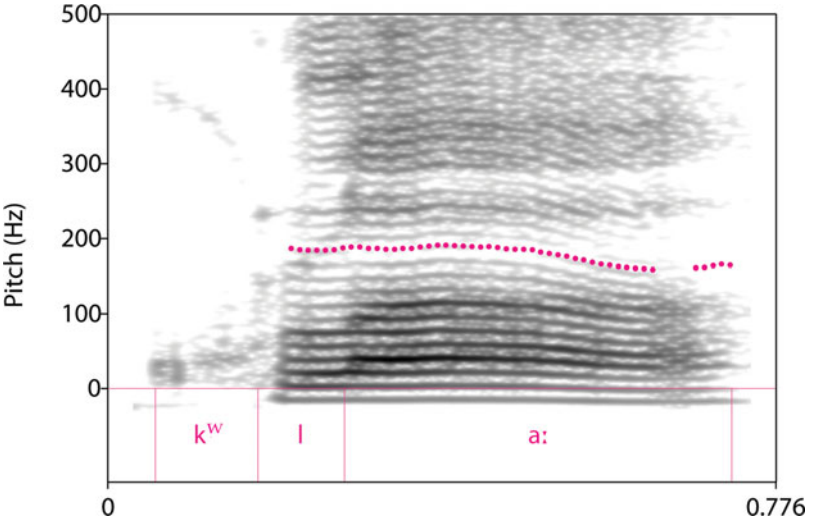


**Figure 6** (Colour online) *Narrow band spectrogram and pitch track of* [ˈkʷlaː] 'slight'.

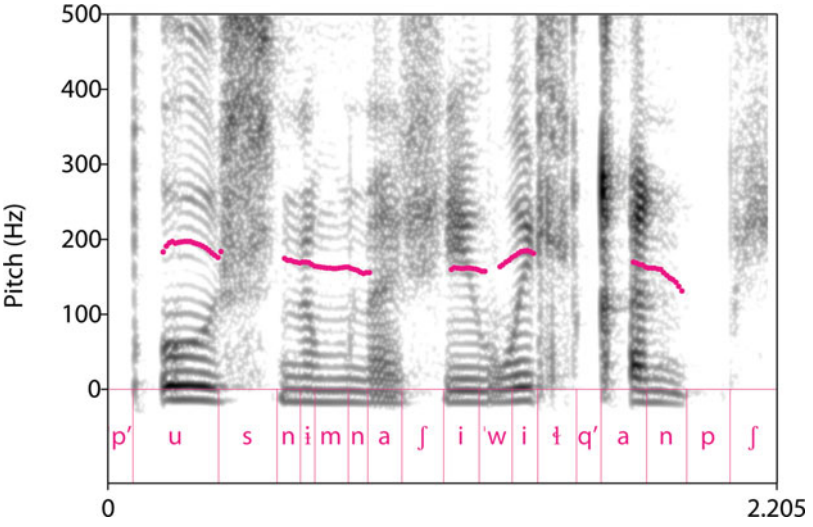


**Figure 7** (Colour online) Narrow band spectrogram and pitch track of [ˈpʼuːsn̪ɬmnaʃ iˈwiɬqʼanpʃ] *ɬp'úusn̪ɬmnash iwíɬk̲'anpsh* 'The cat scratched me'.

Declarative L boundary tone never overrides or concatenates with a sentence-final lexical pitch accent. Just like words in isolation (Figure 5), if the sentence ends in a lexical pitch accent, there is no final pitch fall at the end of the sentence. An example is provided in Figure 8, where the similarity of the highest pitches in each word and lack of sentence-final L can be observed.

As noted by Hargus & Beavert (2009), the pitch peaks of declarative sentences are determined largely by lexical pitch patterns. In Figure 9, which contains a sentence-final long

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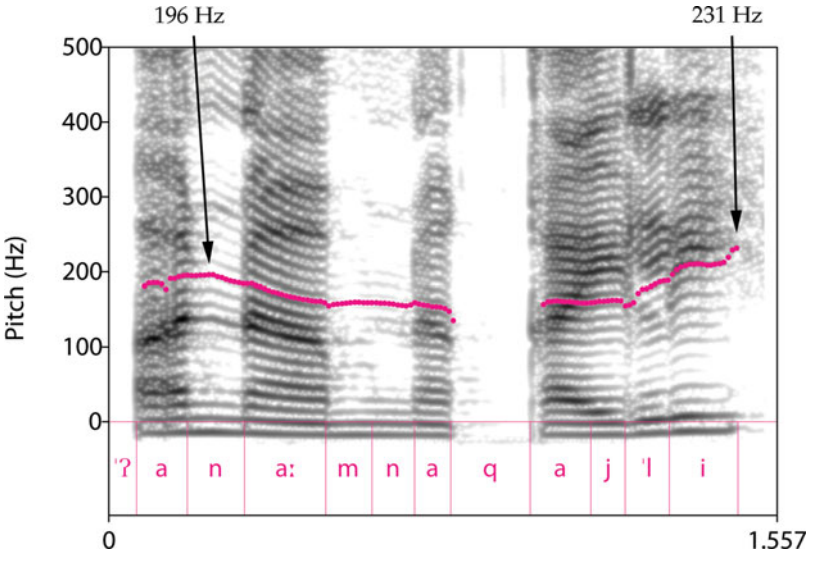


**Figure 8** (Colour online) Narrow band spectrogram and pitch track of ['ʔanaːmna qaj'li] *Ánaamna k̲aylí* 'His/her shoe wore out'.

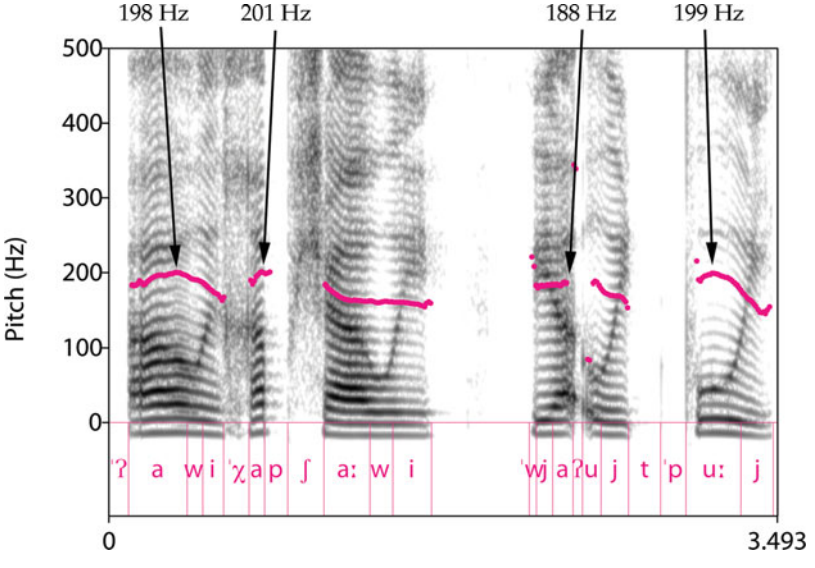


**Figure 9** (Colour online) Narrow band spectrogram and pitch track of ['ʔaw i'χapʃaːwi 'wjaʔujt 'puːj] *Áw i̲xápshaawi wyáʼuyt púuy* 'Now the first snow has fallen'.

vowel, notice the similar pitch level of the lexical pitch accents in each word. (Declarative L boundary tone can also be seen in Figure 9.)

Two kinds of deviations from lexical pitch accents, both involving elevated pitch, have been identified:

(i) Elevated pitch excursion can be used for semantic emphasis. In Figure 10, note the raised pitch (299 Hz) on ['nɨmnɨwiːt] 'really' relative to the other lexical pitch accents.

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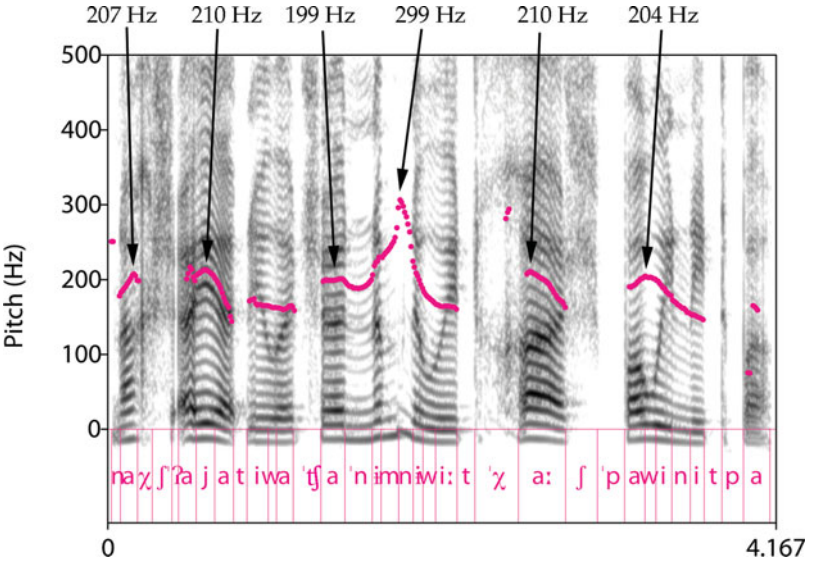


**Figure 10** (Colour online) Narrow band spectrogram and pitch track of [ˈnaχʃ ˈʔajat iwaˈʈʃa ˈnɨmnɨwiːt ˈχaːʃ ˈpawinitpa] *Náx̲sh áyat iwachá nímnɨwiit x̲áash páwinitpa* 'One woman was really aggressive at the give-away'.

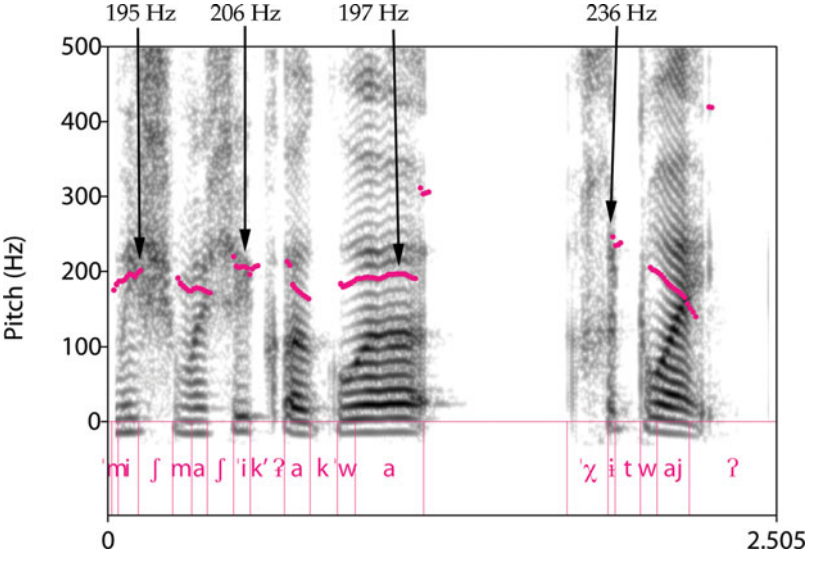


**Figure 11** (Colour online) Narrow band spectrogram and pitch track of [ˈmiʃmaʃ ˈikʼʷak ˈwa ˈχɨtwajʔ] *Míshmash íkw'ak wá x̲ítway'?* 'Is that your relative?'.

(ii) Yes/no questions can be marked by elevation of the rightmost pitch accent of the sentence, as in Figure 11.

Yes/no questions are alternatively optionally marked by a sentence-final glottal stop, also seen in Figure 11. Sahaptin glottal stop frequently exhibits widely spaced glottal pulses, and would thus be expected to depress pitch. However, like sentence-final declarative L, final glottal stop does not override sentence-final lexical pitch accent, as seen in Figure 12. (This

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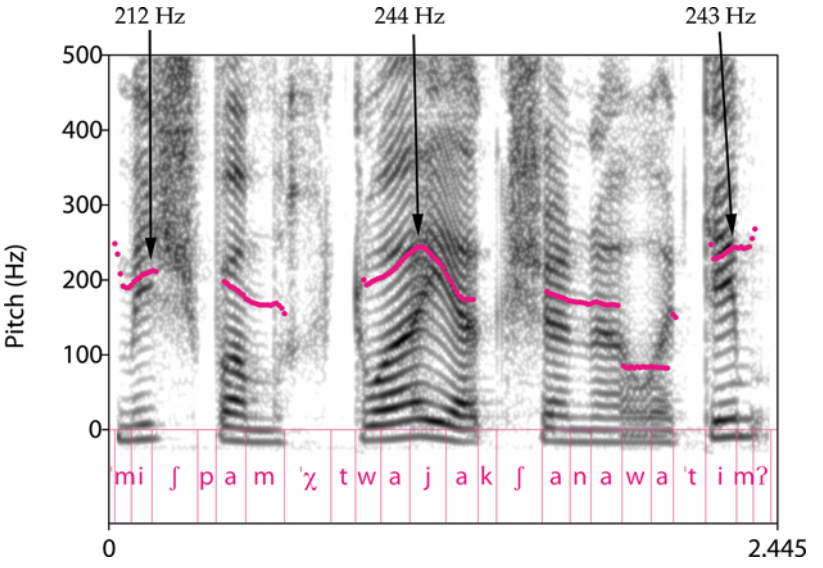


**Figure 12** (Colour online) Narrow band spectrogram and pitch track of [ˈmiʃpam ˈχtwajakʃana waˈtimʔ] *Míshpam xtwáyakshana watím'?* 'Did you (PL) come to visit me yesterday?'.

sentence also illustrates the optionality of rightmost pitch accent raising in yes/no questions: in Figure 12 the sentence-final lexical accent is NOT the highest pitch in the sentence.)

## 5 Transcription

1. [ʔatjaˈjaːja ˈʔaːnin]
*Atya-yáaya* *Áan-in*
cold.wind-legendary sun-COM
'Cold Wind and Sun'

2.
[papatanaˈwiːχʃana ʔatjaˈjaːja ˈʔaːnin ˈʃin ʔiˈwa ˈχtutχaw]
*Papa-tanawíix-sha-na* *Atya-yáaya* *Áan-in* *shín* *i-wá* *xtú-txaw.*
RECP-argue-IPFV-PST cold.wind-legendary sun-COM who 3SG-be strong-most
'Cold Wind and Sun were arguing with each other about who was strongest.'

3.
[ˈkuːk awˈku ʔiˈpajʃna ˈt͡s'muj ˈʔutpaːsji wjaninˈɬa]
*Kúuk* *awkú* *i-páysh-na* *ts'múy* *útpaasy-i* *wyanin-łá.*
at.that.time then 3SG-appear-PST warm wear.robe-PPL travel-AGT
'Then a traveler appeared wearing a warm robe.'

4.
[ˈpapaʔiːʔiːna ʔatjaˈjaːja ˈʔaːnin]
*Pápa-'ii'ii-na* *Atya-yáaya* *Áan-in*
RECP-agree-PST cold.wind-legendary sun-COM

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[ʔanaˈpɨnχuʃ ʔiʃaˈpat͡ʃaχʷt͡ʃʼkta ˈʔutpaːs wjaninˈɬaːn ʔiˈwata ˈχtutχaw]
*ana-pɨ́n-x̲ush* *i-shapá-cha x̲wch'k-ta* *útpaas* *wyanin-ɬáan* *i-wá-ta* *x̲tú-tx̲aw.*
REL-3SG-first 3SG-CAUS-remove-FUT robe travel-AGT.ACC 3SG-be strong-SUP
'Cold Wind and Sun agreed that the first one who made the traveler take his robe off would be the strongest.'

5.
[ʔawˈku ʔatjaˈjaːja ʔiwsˈlat͡sajka ˈχtuwiki]
*Awkú* *Atya-yáaya* *i-wslátsayk-a* *x̲tú-wiki,*
then cold.wind-legendary 3SG-blow-PST strong-ADV

[kutja ʔanaˈmɨɬ ʔiˈhulina]
*kutya* *ana-mɨ́ɬ* *i-hulí-na*
but REL-some.quantity 3SG-blow-PST

[ku majkˈqʼaːp piˈnat͡ʃat͡sʼmujka wjaninˈɬa]
*ku* *mayk-k̲'áap* *piná-chats'muyk-a* *wyanin-ɬá.*
then COMP-secure REFL-wrap.warmly-PST travel-AGT
'Then Cold Wind blew strongly, but the more he blew the more securely the traveler wrapped himself up.'

6.
[ku awˈku piˈnajaːnwana ʔatjaˈjaːja]
*Ku* *awkú* *pináyaanwa-na* *Atya-yáaya.*
and then give.up-PST cold.wind-legendary
'And then Cold Wind gave up.'

7.
[ku anaˈmaːl ˈʔaːn ʔiˈχtuna ʔiʔɨ̠t͡ʃuna]
*Ku* *ana-máal* *Áan* *i-x̲tú-na* *i-'ɨ̠chú-na.*
then REL-some.time sun 3SG-make.effort-PST 3SG-shine-PST
'Then Sun shone warmly for some time.'

8.
[ˈkuːk awˈku ʔiˈlaχujχna wjaninˈɬa ku iˈt͡ʃaχʷt͡ʃʼka ˈʔutpaːs]
*Kúuk* *awkú* *i-lá x̲uy x̲-na* *wyanin-ɬá,* *ku* *i-chá x̲wch'k-a* *útpaas.*
at.that.time then 3SG-warm-PST travel-AGT and 3SG-remove-PST robe
'Then the traveler got warm and took off his robe.'

9.
[ku awˈku piˈnajaːnwana ʔatjaˈjaːja]
*Ku* *awkú* *pináyaanwa-na* *Atya-yáaya,*
and then admit-PST cold.wind-legendary

[ˈʔaw ˈʔinχaj ˈʔaːn ʔiˈwa ˈχtutχaw]
*"áw* *ín-x̲ay* *Áan* *i-wá* *x̲tú-tx̲aw."*
now 1SG.POSS-male.friend Sun 3SG-be strong-most
'And then Cold Wind admitted, "my friend Sun is the strongest".'

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