Shiwilu (Jebero)

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Recommended Citation
DOI:10.1017/S0025100312000370.
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Comments
This article was originally published in *Journal of the International Phonetic Association*, volume 43, issue 1, in 2013. DOI: 10.1017/S0025100312000370

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Shiwilu (a.k.a. Jebero) is a critically endangered language from Peruvian Amazonia and one of the two members of the Kawapanan linguistic family. Most of its nearly 30 remaining fluent speakers live in and around the village of Jeberos (District of Jeberos, Province of Alto Amazonas, Loreto Region), at approximately 5° S, 75° W.

The documentation of Shiwilu is scarce and no survey grammar is available. Until very recently, the only trained linguist who had worked on Shiwilu was John Bendor-Samuel, who carried out fieldwork in 1955–1956 and completed a doctoral thesis in 1958 (see Bendor-Samuel 1981 [1958]). An abridged version of the thesis, which includes an outline of the phonology, was published as Bendor-Samuel (1961). Whereas recent publications have focused on the social position of the Shiwilu language (Valenzuela 2010), morpho-syntactic aspects (Valenzuela 2011), and a formal demonstration of its family affiliation with the Shawi language (a.k.a. Chayahuita) (Valenzuela Bismarck 2011), the present article is the first account of its sound system since the work by Bendor-Samuel.

Our work has been made possible thanks to the generous collaboration of Mrs. Emérita Guerra Acho (speaker E) and Mr. Meneleo Careajano Chota (speaker M), to whom we are very grateful. Born in Jeberos in 1935 and 1940, respectively, Mrs. Emérita and Mr. Meneleo grew up speaking Shiwilu at home and were first exposed to Spanish while attending elementary school in their native village.¹

¹ This study took place in the context of a three-year language documentation project (supported by NSF grant DEL 0853281). The data were collected during several field stays in the town of Jeberos and the neighbouring city of Yurimaguas, with some dedicated data collection and recording in February of 2010 and January of 2011, using a Zoom H4n (16-bit wav) digital recorder and a Shure WH30 XLR condenser headset microphone. Most words and phrases were elicited in isolation, whereas the story of the North Wind and the Sun was recorded in seven sections, each of which was briefly related to Mr. Meneleo Careajano in Spanish and then retold by him in his own words.
Consonants
There are 17 consonants, as in the chart below.

<table>
<thead>
<tr>
<th></th>
<th>Labial</th>
<th>Alveolar</th>
<th>Palatal</th>
<th>Velar</th>
<th>Glottal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plosive</td>
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<td>t</td>
<td></td>
<td>k</td>
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<tr>
<td>Affricate</td>
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<td>tʃ</td>
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<td>Nasal</td>
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<td>Fricative</td>
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<td>Trill</td>
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<tr>
<td>Lateral approximant</td>
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<td>ŋ</td>
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<tr>
<td>Approximant</td>
<td>w</td>
<td>ŋ</td>
<td>j</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Keywords are given as phonemic transcriptions, with syllable boundaries indicated by dots (full stops) and stress by [ˈ].

|       |       |       |       |       |       |
|       | p ˈpən | ‘fire’ |       |       |       |
|       | t tuʔ.ˈtuʔ.pi | ‘knee’ |       |       |       |
|       | k ˈkən.ma | ‘2SG’ |       |       |       |
|       | tʃ ˈtʃək | ‘straight’ |       |       |       |
|       | ʔ ˈkən.maʔ | ‘indigenous person’ |       |       |       |
|       | s ˈsa.mər | ‘fish’ |       |       |       |
|       | ʃ ˈʃaʔ.wən | ‘squirrel monkey’ |       |       |       |
|       | m ˈmər.pi | ‘belly’ |       |       |       |
|       | n ˈna.nə | ‘that’ |       |       |       |
|       | n ˈniʔ.ˈwa | ‘dog’ |       |       |       |
|       | ɾ ˈu.ru | ‘deer’ |       |       |       |
|       | ɾə ˈmoʔ.ɾ.pi | ‘ripe’ |       |       |       |
|       | l ˈa.liʔ.ˈla | ‘another’ |       |       |       |
|       | ŋ i.’a.ˈpa | ‘shotgun’ (Quechua loan) |       |       |       |
|       | w ˈwa.səɾ | ‘baby’ |       |       |       |
|       | ŋ ˈəi.ˈmi.nən | ‘blanket’ |       |       |       |
|       | j ˈja.ˈək | ‘fat’ |       |       |       |

There is a marginal [h], which we only came across in [ahã], an affirmative interjection. Before describing the detailed pronunciation of these segments, we provide a description of the syllable structure.

Syllable structure
The general syllable structure is (C)(C)V(C), with both onsets and codas being optional. It would appear that all consonants except /ʔ/ and /ɾ/ can occur in the onset; /ɾ/ can only be an onset word-internally. CC-onsets are virtually restricted to /kw/; as in /kwa/ ‘1SG’, /kwa.ˈni/ ‘type of meal’ (Spanish loan, juane). /pw/ is a marginal onset occurring in /pwi.ˈnu/ ‘water jar’ (Quechua loan). Syllable contractions may produce other combinations with /w/. Except for /ʔ/ and /ɾ/, intervocalic single consonants are onsets, as in /a.ˈwa/ ‘mother’, /ˈlu.ˈpaʔ/ ‘land’. Word-internally, /ɾ/ and /ɾə/ remain codas, as in /paʔ.ˈa.ˈwaʔ/ ‘so that we (INCL.) go’, /wəɾ.ˈaŋ/ ‘having got lost.3SG’ (for the realization of these consonants, see section ‘Detailed pronunciation of consonants’ below).
Table 1 Legitimate word-final VC structures.

<table>
<thead>
<tr>
<th></th>
<th>k</th>
<th>n</th>
<th>r</th>
<th>ʔr</th>
<th>?</th>
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</thead>
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<td>ə</td>
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<td>+</td>
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<tr>
<td>i</td>
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<td>u</td>
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<td>rare</td>
<td>rare</td>
<td>+</td>
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<tr>
<td>a</td>
<td>+</td>
<td>+</td>
<td>rare</td>
<td></td>
<td>+</td>
</tr>
</tbody>
</table>

The vowel /ə/ must be followed by a coda consonant. Accordingly, intervocalic consonants after /e/ geminate, regardless of the position of the stressed syllable, as in /ˈkoʃ.ki/ ‘sun’, /ˈkoʃ.kan/ ‘paca (type of rodent)’, /wanˈkot,tək/ ‘boquichico (type of fish)’, /ˈsɔn.nan/ ‘lake’, /ˈsən.ək/ ‘afanninga (type of snake)’. However, unlike /k tʃ n k/, /r/ does not geminate and occurs in the onset, like other word-internal occurrences of /r/, as shown by /ˈtor.ək/ ‘palometa (type of fish)’. There are a few words with a /ra/ coda, like /ˈmur.na/ ‘bubbles’ and /ˈsən.ə/ ‘pineapple’, which may go back to earlier /ra/.

The consonants /k ʔ tʃ r n/ are allowed in a word-final coda. Not all combinations of the four vowels and these coda consonants are equally frequent or even possible, as shown in Table 1. The syllable rhymes /ir/ and /ar/ occur only in loan words, as in /ˈpi.ər/ ‘Pilar’, /ˈta.pir/ ‘Daniel’, /ˈma.pir/ ‘Manuel’, /ˈpi.ər/ ‘Fidel’. The rime /u ʔtʃ/ occurs in native words, but is a variant pronunciation of /u ʔʃ/ (see section ‘Other processes’ below).

 Morphological processes create illegitimate combinations of segments which are repaired by deletions, as in /ˈta.nan+k/ ‘forest+LOC’ giving /ˈta.nak/ ‘to/in the forest’.

Detailed pronunciation of consonants

Plosives

Syllable-initial /p t tʃ k/ are voiced after a nasal consonant within the word, as in /ˈtʃum.pi/ [ˈtʃum.bi] ‘caracolito (type of snail)’, /ˈlan.tsk/ [ˈlan.dɔʔk] ‘foot’, /pa.ˈpin.ku/ [pa.ˈpin.gu] ‘old man’. The assimilation can be suppressed, as in the Spanish loan /u.ˈxin.pi.ku/ [u.ˈxin.pi.ku] ‘Olympic’. In other syllable-initial positions they are voiceless unaspirated. Before /s/, there would appear to be a tenseness feature accompanying voiceless occurrences of /p tʃ k/, whose nature awaits further research.

 Syllable-final /k/ is typically preglottalized. Utterance-final /k/ may have an oral release, as illustrated by /ˈsɔ.Ɂək/ [ˈsɔ.Ɂəʔk] ‘afanginga’, be unreleased, as illustrated by /ˈju.tsk/ [ˈju.ʃəʔk] ‘someone who gets angry easily’, or have an ejective pronunciation, as illustrated by /ˈi.ʃək/ [ˈi.ʃəʔk] ‘bat’. Morpheme-final /k/ is retained in the coda before a vowel-initial suffix, pronounced as a coda [k] followed by [ʔ], as in /u.ˈkoʃ+apa+ʔi/ ‘emit stench from blood+CONTINUOUS+3SG’ [u.ˈkoʃ.ʔa.pə.ʔi] ‘the blood on him stinks’, /ən.ˈtʃok+ima/ ‘hair + HEARSA Y’ [ən.ˈtʃok.ʔi.ma] ‘it is said that hair’.

 /ʔ/ freely occurs throughout the word, as in /ma.ʔ,ˈpʊʔ.ʔiʔ.ʔaʔ/ ‘how perhaps’. Minimal pairs in which it contrasts with zero are /ˈðuʔ.ʔoɾ/ ‘sit down!’ /ˈðu.ʔoɾ/ ‘moon’, /ˈkən.məʔ/ ‘indigenous person’ vs. /ˈkən.mə/ ‘2SG’.

Rhotics

/ɾ/ and /ʔɾ/ are contrastive inside the word and word-finally. However, word-finally, the glottalization is variably lost. For instance, the imperative marker /(k)ɾʔɾ/, as occurring in /ˈpaʔ.ʔoɾ/ ‘Go!’, /ˈtu.ʔiʔ.ʔoɾ/ ‘Follow him!’, /ˈu.ʔoɾʔɾ/ ‘Drink!’, frequently appears as /(k)ɾʔɾ/. In word-final position, the contrast can usually only be ascertained after suffixation. A word-internal contrast is illustrated by /ˈmɔɾ.pi/ ‘belly’ versus /ˈmaʔɾ.pi/ ‘ripe’, while /ˈwə.ʔan/ ‘having stung.3SG’ versus /ˈwəʔɾ/ ‘an ‘having got lost.3SG’, both containing the 3SG participle suffix /əʔn/, and /ˈkəɾ.ʔi/ ‘he brought’ versus /ˈkəʔɾ.ʔi/ ‘it is black’, both containing
the 3SG suffix /Ɂi(n)/, illustrate a morpheme-final contrast before a vowel and a consonant, respectively.

Glottalized /ɾ/ is a tap accompanied by a glottal closure. Preceding a word-internal consonant or, when it is present, word-finally, the glottal closure is initiated during the tap, creating a creaky voice and often reaching full closure terminating the consonant.

Intervocalic /ɾ/ is post-glottalized as [ɾ], as in /wɔr.t/'an/ [wɔɾ.t'ən] ‘having got lost.3SG’, /kwɔɾ.t'Ɂa.pa.Ɂsk/ [kwɔɾ.t'Ɂa.pa.Ɂsk] ‘I am (currently) heavy’, /kwɔɾt'Ɂ/ ‘heavy’ + /Ɂn/ ‘not’ + /Ɂi/ ‘3SG’ [kwɔɾ.t'Ɂiʔ.niʔ] ‘it’s not heavy’. (On /ni/ as the pronunciation of /Ɂi/ see section ‘Other processes’.) This is parallel to word-final /k/, as in [u.Ɂək.Ɂa.pa.Ɂi] ‘the blood on him stinks’, mentioned under Plosives above. Before consonants, particularly /Ɂi/, /ɾ/ may be realized as [d] or [t], as in [nu'kədɁi] /nu.'kər.Ɂi/ ‘I’m cold’. This also applies to /kər.Ɂi/ ‘it is black’, mentioned above. The unglottalized /ɾ/ is an alveolar tap in the onset and an alveolar trill in the coda.

Alveolars

Of the alveolar consonants, /t n l/ are denti-alveolar, the tongue tip touching the upper teeth. Coda /n/ has a variably wide area of contact over the roof of the mouth, maximally [n̪]. In particular after /u/ and /a/, the forward contact is often not made, which gives it an impression of a velar nasal. Before oral plosives and the affricate, the place of articulation is fully assimilated, as in /jɪ.'wi.lu/ + /lu/ ‘SIMILATIVE’ + /l/ ‘2SG’ [jɪ.'wi.lu.lumбуʔ.Ɂa] ‘You are like a Shiwilu woman’, /ju.'lu.Ɂan.ku/ [ju.'lu.Ɂan.gu] ‘type of flower’, /lu.ʧɔk/ [Ɂu.ʧɔk] ‘I am going to talk’, and /in/ ‘REFLEXIVE’ + /n/ ‘tie’ + /Ɂi/ ‘3SG’ [in.'dəm.buʔ.Ɂi] ‘he tied himself up’. However, before nasal consonants, no assimilation occurs, as in ‘kən.Ɂa [ˈkəŋ.Ɂa] ‘lake’ and /ən.Ɂa.Ɂaʔ.Ɂa/ [ˈəŋ.Ɂa.Ɂaʔ.Ɂa] ‘From where?’.

Palatals

The consonants listed as palatal have the tongue tip, tongue blade and the forward part of the tongue body raised, the tongue tip being behind the upper front teeth. The contact stretches from dental to palatal for [t] /n Ɂ]. Friction for [ʧ] is post-alveolar.

Approximants

In addition to the prevalence of glottal stops, the general character of the language is determined by the frequent occurrence of approximants, among which the dentic-alveolar approximant /ð/ stands out. The tongue front is somewhat convex with raised tip and sides, as for /t/ or /n/, with the sides approximating the lateral gums and the tip approximating the area of the alveolar ridge and front teeth, without making contact. It is never interdental, unlike the dental approximants of Kagayanen and other languages spoken in the Philippines as well as five Western Australian languages (Olson et al. 2010). Figure 1 shows trajectories

![Figure 1](https://example.com/figure1.png)

Figure 1 F1, F2, F3 and F4 during five approximants, plotted on a normalized time scale.
of the first four formants (Boersma & Weenink 1992–2010), averaged over three repetitions of the five approximants by speaker M as occurring in /ˈʃa.ʃa/ ‘sister’, /ˈʃa.ɒa.Ɂi/ ‘he/she has dazzled/non-openable eyes’, /ˈʃa.ʃa/ ‘three’, /ˈʃa.ʃa/ ‘face’ and /ˈʃa.ʃa/ ‘mother’. Of the other four approximants, /Ʉ/ resembles /l/ most, in particular in having a high F1. However, its F2 is lower than that of /l/, while being higher than that of /w/. The token of Kagayanen interdental /Ʉ/ given by Olsen et al. (2010) has an F2 of 1950 Hz, as opposed to 1240 Hz in our Shiwilu data. The mean duration of /Ʉ/ and /Ʉ/ is 170 ms, that of /l/ w j/ 112 ms. /Ʉ/, but not /Ʉ/, is occasionally produced with light lateral friction. Perceptually, /Ʉ/ may sometimes give the impression of a lateral sound, but it never varies with either /l/ or /Ʉ/.

Although /i/ is rare after /l/, it contrasts with /Ʉ/ in this context, as shown by /u.ˈʃa.Ɂi.n.pi/ ‘frequently, constantly’. The default consonant in loans is /Ʉ/, as in /u.ˈʃu.Ɂi.n.pi.Ɂi.n/ ‘Olympic’.

Vowels
There are four vowels, /i ə a u/. There is no quantity contrast for them, and they can appear in all positions in the word.

/i/ is a close-mid to close unrounded front vowel, while /u/ varies from [ɯ] to [o], most typically a weakly rounded close-mid back vowel. /ə/ varies from centralized front open [ɪ] in open syllables via centralized front open [æ] to central [a] in closed syllables. The quality of /ə/ varies between mid centralized front [ɛ] to close-mid central [ɜ]. This vowel is unusually short, particularly between voiceless consonants, in both stressed and unstressed syllables. It is often only 20–40 ms long, as in /ˈʃu.ʃu/ ‘raise a child’, /ˈʃi.ʃu.ʃk/ ‘skin, bark’, /ˈʃaj.ʃk/ ‘straight’, /ˈʃi.ʃu.ʃk.ʃi.n.ʃu/ ‘indeed’. In running speech, this reduction may be more extreme, as in /ˈʃi.ʃu.ʃu.ʃk.ʃi.n.ʃu/ ‘indeed’ in the same story.

Stress
Stress occurs once per word. Regular stress occurs on the second syllable of the word, as in /ˈʃi.ʃu.ʃu.ʃk.ʃi.n.ʃu/ ‘indeed’ in the same story.
have initial stress, as in /ˈsi.sok/ ‘porcupine’, except when there is no other syllable available, as in /ˈnək/ ‘the place I used to live’. A marginal pattern is final syllable stress in polysyllables, occurring in /ˈwi.ə/ (approximately [wˈja] ‘squirrel’ and /ˈsi.mir/ ‘Varadero (place name)’, while /ˈin.kə.tuʔ/ ‘four’ has exceptional stress on the first syllable.

Incorporated verbs, nominal compounds and many suffixed forms are treated as single words, as in /ˈi.kor/ ‘hurt’ + /ˈmutuʔ/ ‘head’ + /ˈloək/ ‘1SG’ giving /ˈi.kor.mu tuʔ. loək/ ‘I have a headache’ and /pi.ˈokək/ ‘house’ + /ˈmutuʔ/ ‘top beam of slanted roof’. Again, suffixing /ˈu.ru/ ‘deer’ with the diminutive /ˈja/ gives regular /ˈu.ru.ˈja/ ‘small deer’; adding delimitative /-saʔ/ retains the accent on the second syllable, /ˈu.ru.ˈja.zaʔ/ ‘only a small deer’. However, some suffixes impose other stress patterns, outlined in the remainder of this section.

The desiderative prefix /ˈja/ attracts the stress, as in /ˈja sa.kaʔ. tu. loək/ ‘I want to work’, from /ˈsa.kaʔ. tu. loək/ ‘I worked’, /ˈja.lu.ˈnok/ ‘I want to speak’, from /lu.ˈnok/ ‘I spoke’.

The locative suffix /k/ (or /kək/ after stressed syllables) attracts stress when suffixed to disyllabic or monosyllabic words, as in /ˈki.ˈməʔ+k/ /ˈki.ˈmak/ ‘to/in Lima’, /ˈpən+kək/ /ˈpən.ˈkək/ ‘into/in the fire’. Exceptional stress survives this suffixation, as in /ˈsi.ˈmir.ˈkək/ ‘to/in Varadero’. On trisyllabic or longer words, the stress is preserved, as in /ˈfi.ˈwi.ˈlu+k/ giving /ˈfi.ˈwi.ˈlu.k/ ‘to/in Jeberos’.

The 3SG participial suffix /ən/ attracts stress when suffixed to a monosyllabic verb, as in /ˈʔuʔ+ən/ /ˈʔuʔ.ən/ ‘he/she having sat’, but /ˈsa.ˈkaʔ. tu + an/ gives regular /ˈsa.ˈkaʔ. tan/ ‘he/she having worked’.

The emphatic affirmative /ˈun.ˈta.ˈna/ is inherently stressed, as in /ˈnana/ ‘3SG’ + /ˈkə+ˈpredictive1SG’ + /ˈun.ˈta.ˈna/ giving /ˈna.ˈna.ˈkun.ˈta.ˈna/ ‘That’s me’.

The particle /ˈtʃi/, used after a word by male speakers to express regret, imposes stress on the preceding syllable, as in /ˈu.ru.ˈja.ˈtʃi/; e.g. ‘What a shame about my small deer (male speaker)’.

Other processes

In addition to stop voicing after nasals, nasal place assimilation before oral stops and deletions due to syllable repair, a number of other processes occur.

Word-internally, alveolar /t, n, l/ change to /tʃi n ʃi/ after coda /ɾ, ʔɾ/, as shown for the lateral by /ˈka.soʔɾ/ ‘sweet’ + /ˈluʔ/ ‘powder’, giving /ˈka.ˈsoʔɾ.ˈluʔ/ ‘sugar’, /ˈsi.ˈmir/+ /ˈlun/ giving /ˈsi.ˈmir.ˈlun/ ‘Varadero woman’. Before the consonants with a full alveolar closure, /t n/, coda /ɾ ʔɾ/ are deleted after effecting the palatalization, with compensatory backward spreading of the stop, as in /ˈkoʔɾ/ ‘manioc’ + /tək/ ‘skin’, giving /ˈkət.ˈtʃək/ ‘manioc skin’, /ˈkuʔ,ˈapər/ ‘woman’ + /ˈnən/ ‘3SG.POSS’ giving /ˈkuʔ.ˈa.ˈpən.ˈnən/ ‘his woman’, /ˈkoʔɾ/ ‘manioc’ + /ˈnələ/ ‘stick’ giving /ˈkən.ˈpən.ˈla/ ‘manioc stick’. In addition, /n+ə/ coalesces to /p/, as in /ˈtʃi.ˈmɪn+ˈkən(ə)/ ‘die+3SG’ is /ˈtʃi.ˈmi.ˈpɪ(ə)/ ‘he died’, and /ɾ/ + /ə/ coalesces to /ʃi/, as in /ˈwəɾ+ˈʃi/ to give /ˈwəɾ.ˈʃi/ ‘stung.3SG’, with gemination after /s/. Glottalized /ɾ/ does not have this effect, as shown by /ˈwəɾ.ˈkəi/ ‘got lost.3SG’.

/ˈwəɾ/ varies with /u/, as in /ˈpuʔɾ.ˈa.ˈpa.ˈkəi/. /ˈpəwəɾ.ˈa.ˈpa.ˈkəi/ ‘he is fishing’, /ˈu.ˈran/. /ˈwəɾ.ˈran/ (ˈpaʔ.ˈkəi) ‘having eaten.3SG (s/he left)’.

/i, ɯ/ will variably turn into glides after vowels, as in /ˈlə.ˈwək.ˈa.ˈpa.ˈloʔ/. /ˈlə.ˈu.ˈka.ˈpa.ˈloʔ/ [ˈlaw.k.ˈa.ˈpa.ˈloʔ] ‘I hear’. /a+i/ is variably reduced to [əj], [ij], [i], as in /ˈkəw/ ‘1SG’ + /ˈiʔnə/ ‘EMPHATIC’ /ˈkwaiʔ.ˈna/ [ˈkwaʔj.ˈna] ‘1 for one’.

Complex reductions within words lead to glides from /i, ɯ/ involving a rightward displacement of /ɾ/, as shown by /ˈsu.ˈluʔ/ ‘Humboldt woolly monkey+ˈin.ˈpuʔ/ ‘NEG’ [su.ˈluʔ.m.ˈbuʔ] ‘not a Humboldt woolly monkey’, and, with loss of /n/ after it metathesized with coda /ɾ/ and voiced /k/ to /ɡ/, in /ˈtʃi.ˈmɪn/ ‘die’ + /ˈsɾ.ˈka.ˈsuʔ/ ‘NOM.3PL’ giving /ˈtʃi.ˈmjoɾ.ˈɡa.ˈsuʔ/ ‘those who died’; /ˈja/ ‘DESIDERATIVE’ + /ˈtʃi.ˈmɪn/ + /ˈaʔ.ˈka.ˈsuʔ/ ‘NOM.3SG’ giving /ˈja.ˈtʃi.ˈmjaʔ.ˈga.ˈsuʔ/ ‘The fact that he wants to/will die’; /ˈlun/ ‘speak’ + /sʔɾ.ˈka.ˈwa.ˈsuʔ/
giving /luʔ.r.ɡa.wa.suʔ/ ‘What have they spoken?’ In these cases, the voicing of the oral stop is due to the underlying nasal consonant.

The diminutive suffix /jɑ/ combines with palatalization of alveolar consonants in some stems. The process is both optional and lexically selective.² The palatalization of alveolars indicates a further degree of diminution, as in /ˈlaʔpi/ ‘stone’, /laʔ.pi.ja/ ‘little stone’ and /ˈlaʔ.pi.ja/ ‘very little stone’; /ja.ˈpa.ʃa.saʔi/ 3SG.DIM.DELIMITATIVE ‘only very little him/her’ by the side of /na.ʃa.saʔi/ ‘only little him/her’.

**Intonation**

The declarative, interrogative and continuous intonation contours are phonetically distinct, but because their general shapes are similar, they may be variants of the same phonological tone structure. The first three panels of Figure 2 (next page) show lexically comparable intonational phrases with two stressed syllables in a final declarative phrase (panel (a)), a final interrogative phrase (panel (b)), and prefinal phrase (panel (c)). Stressed syllables have falling pitch accents, one in every word. The accentual peaks are higher in interrogative final interrogative phrase (panel (b)), and prefinal phrase (panel (c)). Stressed syllables have falling pitch accents, there is a very different vocative intonation, which has a declarative intonation is given in panel (f).

Stems. The process is both optional and lexically selective.² The palatalization of alveolars is due to the underlying nasal consonant.

Finally, some particles come with tone, as shown in Figure 3. First, there are two question particles, /aʔ.tʃa/ ‘INTERROG’, as in /ˈðən.kon aʔ.tʃa/ ‘Who are you?’ and /aʔ.taʔ/ ‘SURPRISED INTERROG’, as in /ˈmaʔ.non aʔ.taʔ/ ‘What on earth is this?’ They are independent words, as shown by the wide-contact pronunciation of coda /n/ in /ˈmaʔ.non aʔ.taʔ/. They cause the stress to be on the first syllable of the preceding word, while having a high toned final syllable, as shown in panel (a) of Figure 3. Panel (b) shows the low toned particle /ˈtɔn/, used by female speakers to express regret, as in /u.ˈtʃa ˈtɔn/ ‘What a shame about my small deer (female speaker)’. Like its male counterpart /tʃi/, it imposes stress on the preceding syllable, as shown in /ˈkə.ˈlu.ˈwiʔ.ˈpa.ˈkɪ tʃi/ and /ˈka.ˈlu.ˈwiʔ.ˈpa.ˈˈxɪn ˈtɔn/ ‘I’m sorry he is sick’, whereby in these longer words the original stress appears to be preserved as well. This female form shows that /ˈtɔn/ is an independent word in not allowing the word-final nasal to voice the initial /t/.

Pitch accents are deleted as a result of morphological derivations (see section ‘Stress’ above), but are neither deleted nor pronounced with reduced pitch range as a function of information structure. For instance, /ˈnun kɪʔ.a.piʔ.nsk, ˈpun.’pu.nan kɪʔ.a.ˈpa.lsk/ ‘I don’t see a canoe, I see a raft’ has pitch accents on all four words, despite the ‘given’ status of /ˈkɪʔ.a.ˈpa.lsk/ ‘see.CONTINUOUS.1SG’. As for the expression of information structure by other means, it is noted that the delimitative suffix /saʔ/ ‘only’ is sometimes used to convey narrow focus.

² There are many places in this article, in particular in the sections on stress and intonation, in which we might have referred to Bendor-Samuel (1981 [1958]), whose description is in terms of Firthian prosodies. Besides numerous confirming findings, there are many occasions for motivating differences in analysis and a few apparent differences in the data. In this particular case, it is to be noted that Bendor-Samuel reports a general process of palatalization in diminutives, suggesting that the palatalizations have recently become lexicalized. A full account is beyond the scope of this article.

³ The palatalization of /l/ in diminutives also occurs in central Peruvian Quechua and may be an areal feature (Adelaar 1977: 290–292).
Figure 2  Intonation contours for declarative (panel a) and interrogative (panel b) /ˈʎiɭ.ɫsk ˈnun/ ‘I see a canoe/Do I see a canoe?’ and for non-final /ˈʎiɭ.ˈapiɫsk ˈnun/ ‘I don’t see a canoe’ (panel c), as well as a command intonation for /ˈkaɭ.ksɔɭ.ɭaɭ.mantʃuɭtʃu/ ‘Eat the meat of a white-lipped peccary’ (panel d), a vocative intonation on /ˈðɔk.kaˈnan/ ‘paca (type of rodent)’ (panel e) and a declarative intonation for the same word /ˈðɔk.ˈka.nan/ (panel f). Speaker M.

Recorded passage
As indicated in footnote 1, the story of the North Wind and the Sun was recorded in seven sections, each of which was briefly related to speaker M in Spanish by the first author and then retold by him in his own words. The last section was recorded some six months later. The transcription is phonemic. Parentheses indicate intonational phrases.
Figure 3 Intonation contours for interrogative /ma?nən aʔtaʔ/ 'What is it?' and /u.ru.ʃa tən/ 'What a shame about my small deer' (panel b). Speaker E.

Transcription
The transcription is broad, and exclusively uses segmental symbols that were assigned to the vowel and consonant phonemes.

(tan.'lu.wa) (kək.'ki.ðək) (in.'ju.ta.pa.ʌi.na?) (ðə.'ni.pa? aʔ?'pin.ta? nan.'ta.pi.ðək) (tan.na?) || (tan.'lu.wa) ('kək.ki.i.'tu.ʌi) ('kwa.kə aʔ?'pin.ta? kən.'mak.lan nan.'ta.pi.ðək.ku) || (tu.'sik) (kək.'ki.lər naʔ.'pi.Δi) (tu.'mu?pa.la) ('kwa.kə aʔ?'pin.ta? nan.'ta.pi.ðək.ku kən.'mak.lan) (i.'tu.ʌi) || (na.'nək.ʌi.ma) (a.'la?.sa?) ('ja.ʌi? ʌi?.tu.ʌi) || (an.'pu.lu?tuok i.'də.mu.nən.ʌok in.'pu?.pi.tu.su?) (pək.'pi.ʌə.'ʌi) || ('na.nək ka.'tu? 'də.pər wa.'nu.ran.na?) (tan.'lu.wa kək.'ki.lək tu.'ʌi.na?) ('na.na) (uk.'a.pi.lə.ʌra.su?) (na.'nuk.'a.pi.lə.ʌra.su?) [NB: The final intonational phrase is a faster version of the preceding two] || ('dən.'le.'ɾi.pa?) (i.'də.mu.nən aʔ?'dək.'ʌi) (na.'na?.ka aʔ?'pin.ta? nan.'ta.pi.ðək) (ən.'ta?n i.'pa?.la a.sək 'iʔ.ək) || (na.'nən.tu tan.'lu.wa) ('pək.ku?) ('pək.ku?) ('pək.ku? aʔ?'tu.ʌi) || (pək.'ku?.tu.ku.əi.ma 'na.na 'ja.ʌi?) (aʔ?'pin.ta?) (in.'su?.wər.pi.ʌi) (na.na an.'pu.ʌi.tuok i.'də.mu.nən.ʌok) (in.'ni.tʃiʔni) (aʔ?'dək.aʔ.əsui?) || (na.'nək.lan 'kək.ki) ('kək.ki pək.'pi.ʌi) (na.'nək pin.'tu.ʌi) || ('iʔ.ər 'iʔ.ər tu.sik) (ima) (na.'ku.su? i.'kə.run.ta?'ʌi 'kək.ki) ('na.nək i.ma) (in.'su?.wər.pi.ʌsui?) ('iʔ.ər i.'də.mu.nən.ʌok) ('u.su?) ('dək.ʌi pə.ji.kan) || (tan.'lu.wa.lər 'na.nək i.'tu.ʌi 'kək.ki) (tək.'kən.tʃi.nən) (kən.ma aʔ?'pin.ta? nan.'ta.pi.la 'kwak.la) || (tək.'kən.tʃi kən.'ma.lər aʔ?'dək.la i.'də.mu.nən.ʌok) || (kwa.'le.ɾiʔ.na) (in.'ni.tʃin.pu?.wi.nək) (i'pa?.la.ka 'ʌiʔ.ən) (i.'pa?.la.kə la.'tək.ʌən) (nan.'ta.pi.maʔ.əsui) ||

Translation
The wind and the sun were disputing who was the stronger. The wind told the sun: ‘I am stronger than you’. Then the sun answered him ‘You are lying. I am stronger than you’, he said. Then a man appeared wrapped in his cloak. He
appeared. Then the two of them, the wind and the sun, stood up and said: ‘The one who is coming, whoever gets him to take off his cloak, he will be the strongest. Now let’s see’. First the wind blew, blew and blew. But the more he blew, the more the man wrapped his cloak around him. He couldn’t make him throw it off. As the sun shone and shone, the man felt very uncomfortable. And so he took off what he had wrapped around him, taking his entire cloak off his body. At that moment the wind told the sun: ‘Indeed you are stronger than me. You managed to have him take off his cloak. I was not able to do it. Now (that) I’ve seen you, now I believe you, that you are the stronger one.

Acknowledgements

We are grateful to John Esling and two anonymous referees for their useful comments on an earlier version of this paper. The first author acknowledges the financial support in the form of the Documenting Endangered Languages grant (DEL 0853281) awarded by the National Science Foundation (NSF) in coordination with the National Endowment for the Humanities (NEH). The second author acknowledges the financial support by the School of Languages, Linguistics and Film of Queen Mary, University of London.

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