RESEARCH REPORT

Text setting in an Itelmen khodila: A phonological analysis

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We examine a traditional Itelmen song type (itl; Chukotko-Kamchatkan) from the perspective of text setting: the phonological correspondence between spoken language and sung text. We suggest that the algorithm that relates spoken text to song in Itelmen is unlike the majority of examples considered in the literature on English and other languages, in that linguistic stress and metrical prominence play no discernible role, nor does syllable weight. Instead, the driving force appears to be matching word edges to (half-)measure boundaries, resulting in predictable anaptyxis (vowel epenthesis) and lengthening. The process is PARAPHONOLOGICAL in that it is related to, but distinct from, the regular phonology of the language, both in the quality of the epenthetic elements and in their placement. While the algorithm makes use of (and thus may inform us about) Itelmen phonotactics, the relationship is not readily characterizable as being phonotactically motivated but is instead controlled by a pattern of mapping linguistic syllables to musical beats.

Keywords: paraphonology, text setting, verbal art, Itelmen, epenthesis

1. Introduction. The khodila is a traditional Itelmen (itl; Chukotko-Kamchatkan) song form, performed as unaccompanied solo vocal music. In many khodilas, the text as sung differs from the corresponding spoken language in various ways, notably in showing anaptyxis (i.e. vowel epenthesis) or epenthesis of phonetic material more broadly (consonants and vowels); for example, the word jaqstǝl ‘sea gulls’ occurs in the khodila we discuss here as jaqestǝl, with epenthetic [e]. In this paper, we examine one khodila in fine detail from the perspective of TEXT SETTING (Halle & Lerdahl 1993) and argue that the deviations from the spoken language are systematic and rule-governed. We propose a simple algorithm that characterizes the vast majority of the mismatches between spoken and sung text. We suggest that the Itelmen results should be of particular interest within a general theory of text setting in that in Itelmen, unlike the majority of examples considered in the text-setting literature (see, among others, Dell & Halle 2009, Hayes 2009, Kiparsky 2020), linguistic stress and metrical prominence play no role in the relevant algorithm, nor does syllable weight or vowel length (which is not phonemically contrastive in Itelmen). Instead, the driving force in the Itelmen khodila appears to be what Halle (2004) and Dell and Halle (2009) call ‘constituency matching’, that is, prioritizing the alignment of linguistic constituent edges to metrical boundaries (measures and half measures), a process seen also in text setting in Kaytetye (Australia; Turpin 2007, 2008). While this happens at the phrasal level in text setting like English, in

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Itelmen, constituency matching at the word level, as well as at higher levels, is central to understanding the mapping.

To a first approximation, much of the relationship under investigation is characterized by mapping two-syllable words to three-beat measures, either by lengthening the first syllable to span two beats or by epenthesizing phonetic material on the second beat, thus preserving the alignment of right and left word edges to the beginning and end of the measure. While the algorithm makes use of (and thus may inform us about) Itelmen phonotactics, the relationship is not readily characterizable as being phonotactically motivated; depending solely upon which beat they fall on in the musical measure, simple clusters may be broken up by epenthesis, while complex clusters may be preserved intact in a single syllable and beat. The rules we have identified thus exemplify what Kiparsky (1977) termed paraphonology—a phonological system that is specific to song.

1.1. The problem: Text setting in an Itelmen khodila. The study of text setting concerns the relationship of a linguistic text to a given musical melody. Much of the literature on this topic that we are familiar with concerns the various strategies used to prioritize an alignment of (linguistically) stressed syllables to strong beats in verse or song. A canonical example is the English sea shanty ‘The drunken sailor’ (see Halle & Lerdahl 1993). In terms of melody, this is sung in lines with four strong beats, but the lines of text have varying numbers of syllables, and the lexical stresses vary across lines in both number and position. Speakers of English have largely consistent intuitions about the optimal mapping of text to melody in ways that are formally characterizable as rules (Halle & Lerdahl 1993) or constraints (Hayes 2009). By way of a brief illustration, consider the four lines in 1, with their primary lexical stresses indicated by acute accents.

(1) a. Whát shall we dó with a drúnken sáilor?
   b. Pút him in the bríg until he’s sóber.
   c. Pút him in the guárdroom til he géts sóber.
   d. Kéep him there and máké him bál her.

The canonical setting for 1a is shown in 2 from Halle & Lerdahl 1993:10. The lexical stresses fall on the strong beats; unaccented syllables fall on the off-beats. Off-beats are further subdivided to accommodate additional unstressed syllables.

(2)

Lines 1b,d differ from 1a in having only three linguistic stresses. In order to preserve the four-beat melody, syllables that would not be accented in speech are mapped to strong beats: un.tíl in 1b and thére in 1d. Line 1c (a variant of 1b) has linguistic stress on two adjacent syllables: the standard resolution is stress retraction—the line is sung with he on the first (strong) beat of the second measure and gets on a weak off-beat.

Text setting in Itelmen differs from more well-studied examples in two ways. In the first place, it is not at all clear whether there is a salient lexical stress in Itelmen, but in any event, it seems to play no discernible role in text setting. There are no effects comparable to 1–2 that can be described in terms of a stress-to-meter mapping. Second, a striking feature of Itelmen khodilas is the apparent ‘ornamentation’ of the text through the addition of vowels and syllables, as commented on by Steller (1774:336), who
called them ‘syllabæ spuriæ’. Example 3 presents the first two lines of the Zaporotskij khodila.1 We include the entire text in the appendices, and the audio file and the musical score with transcribed lyrics are given as supplemental material.2 Here and below, the first line presents the text as sung, and the second line presents the corresponding spoken text. Both lines are in broad transcription. Elements in red in the first line of each example mark deviations in the khodila as sung from the corresponding spoken text.3

(3) a. Оseстас jasena azezank siːn.
    Оста jasna əzzank sin.
    autumn clear outside is

b. Lаččаχ či.inəŋq aʔnхwsǝzin.
    Lаččаχ c’ınəŋq aʔnхwsǝzin.
    sun.dim beautifully shines

Almost every word shows a spoken-to-sung deviation. Especially prevalent are (i) epenthesis (as in jасna, ultimately from Russian jасна) and (ii) lengthening (as in č’i.inəŋq). As a further notational convention, we distinguish two types of lengthening: (ii.a) č’i.inəŋq, written with a period, denotes a single vowel sung over two notes (melisma), each with a separate attack (or onset of phonation), which we distinguish from (ii.b) a vowel that is merely held for two beats (a half note) with no second attack, as in zo:ra (line 32, Appendix A), corresponding to spoken zora ‘twilight’—there is no phonemic vowel length distinction in Itelmen. A vowel followed by a double length symbol (siːn) is held over three beats.

The question we seek to answer in this paper regards the predictability of these deviations between text and song. Is there, in Kiparsky’s terms, a paraphonology of the khodila—a grammar (rules or constraints) that characterizes the relationship between text and song? We argue that there is and that the significant majority of the differences can be accounted for by a straightforward algorithm, and moreover, that the units over which the algorithm functions may offer a small contribution to our understanding of the linguistic phonology of Itelmen.

At this point we should note that, in approaching the problem from the perspective of text setting, we are proceeding as if the melody and text are given and the problem is one of alignment or mapping. Our characterization below treats the epenthetic vowels as a device that allows a two-syllable word to span three beats. But the text is not established ahead of time, so the author could in some sense just as easily have chosen three-syllable words in place of two-syllable ones (say, č’inəŋlaχ ‘beautiful’ in place of jасna ‘clear’ to describe the weather). We return to this point below and argue that the addition of material on designated beats is part of the artistic device that characterizes this song and not merely a type of accommodation, forced by mapping a given text to a known melody.

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2 The supplemental materials for this article can be accessed at http://muse.jhu.edu/resolve/190.

3 In the first word, we cannot pretheoretically determine whether it is the first or second /s/ that constitutes a deviation from the spoken form. The use of red text here simply signals that there is a deviation. As we discuss below, in the few instances where epenthetic consonants differ from the corresponding spoken form, they are in the onset of the second syllable, suggesting that the first /s/ here is the inserted element.
2. ZAPOROTSKIJ’S KHODILA: A PROPOSED ANALYSIS. We develop our proposal for the analysis of the khodila in this section. Before doing so, we offer a few remarks on the Itelmen language.

2.1. ITELMEN: LINGUISTIC BACKGROUND. The Itelmen language is spoken on the Kamchatka peninsula in the far northeast of Russia. From a population that reportedly numbered in the tens of thousands at the beginning of the eighteenth century and spoke three varieties of the language (Krasheninnikov 1755), by the early twentieth century only the Western variety remained, split in two dialect groups and spoken in eight villages along the Okhotsk coast. As of 2021, fewer than five elderly speakers controlled the language both natively and fluidly, although there are others with varying degrees of fluency, including second-generation and heritage speakers, and a linguistic revitalization movement has taken shape (Degai 2016).

One phonological characteristic of Itelmen, relevant to current interests, is its abundance of complex consonant clusters. Medial clusters of as many as seven consonants are attested, and complex clusters are tolerated at word edges, as in 4 (Bobaljik 1996a, Volodin et al. 2021).

![Example 4](image)

Despite the tolerance of clusters, there is evidence for epenthesis (Bobaljik 1996a). Sonorants and glides (and z)\(^4\) occur only adjacent to a vowel (with the exception that nasals and liquids may occur word-initially before another consonant). If morphological patterns would otherwise leave a sonorant not adjacent to a vowel, epenthesis obtains.\(^5\) Schwa epenthesis also obtains if a word form would otherwise have no vowel, even if there is no sonorant (as in 5d). The epenthetic vowel in Itelmen is, as in other Chukotko-Kamchatkan languages, schwa. Some examples of schwa ~ zero alternations exemplifying epenthesis are given in 5.\(^6\)

![Example 5](image)

These phonological facts are relevant to our study since regular phonological epenthesis contrasts with epenthesis in text setting: epenthesis in the khodila is not determined by

\(^4\) That /z/ behaves as a sonorant likely has a historical explanation. Many occurrences of Itelmen /z/ (/ž/ in some sources) have cognates in Chukchi and Koryak in /j/ or /r/, suggesting that Itelmen /z/ may have historically arisen from a sonorant (see Fortescue 2005:9).

\(^5\) Bobaljik 1996a argues that schwa epenthesis is cyclic in verbs. Thus, for example, present tense /z/ surfaces with a preceding schwa after consonant-final stems since a cluster is created on the cycle where the present-tense morpheme is introduced, even if the morpheme on the next cycle is vowel-initial. See 10g below for a relevant example: the context for schwa insertion is opaque on an analysis that does not recognize the intermediate cycle before the addition of the agreement suffix -in.

\(^6\) Epenthesis feeds reduplication, as seen in 5a. There is some variation across sources in the transcription of vowel quality, in part reflecting speaker variation and in part reflecting a lack of consensus on the inventory of reduced vowels—in other words, whether there are phonologically distinct reduced vowels or a single schwa-like vowel that may be colored by its context. We cannot resolve this issue here.
phonological context, and the epenthetic vowel is almost always [e], not [ә]. As we will see below, the patterns we discuss in the analysis of the khodila thus meet Kiparsky’s (1977) definition of paraphonology: phonological patterns that arise from conventions specific to verse.

2.2. Khodila: the basic analysis. As noted above, the khodila is a traditional form of Itelmen song. Khodilas are sung solo, normally by the composer, with no instrumental or other accompaniment, and are traditionally sung while working or walking (for example, while fishing, hunting, gathering berries, or walking across the tundra). Typical khodilas evoke the composer’s feelings toward their present circumstances, love, sadness, desires, and so forth (Krasheninnikov 1755, vol. 2:114, cited in Poro- tov 1968). In contemporary culture, khodilas are now more often heard in contexts of private or public gatherings, where those who know a khodila may be asked to sing it.

The khodila whose structure we investigate in this paper was composed and performed by the late Grigorij Gavrilovich Zaporotskij, originally from the village of Moroshechnoe. It was recorded in 1985 by Alexander S. Asinovsky and Alexander P. Volodin. The khodila consists of fifty-two lines of text grouped into two-line stanzas. Each line may be broken into two six-beat measures, with each measure further subdivided into two three-beat half measures. The metrical structure of each line may be represented as in 6: the first three half measures are three beats each, while the last half measure is a single note held for three beats or for two beats followed by a rest. We encourage the reader to listen to the audio file, included in the supplemental material, while consulting the text and musical transcriptions in order to have a better overall sense of the song form.

We propose that the alignment of text to music in this khodila proceeds as follows.

(7) a. CONDITION 1: Align words to measures. No word spans a measure boundary (qualified below).

b. CONDITION 2: Add a filler vocalic element to the second beat of each three-beat half measure in a line (except the last).

c. CONDITION 3: The last syllable of a line of text is linked to the final half measure (half note plus rest or dotted half note) in a line of music.

Our primary interest lies in condition 2, regulating the non-line-final three-beat half measures, of which the khodila has 156 in total.

To see how these conditions provide an account (to be refined and supplemented below), we walk through the first two lines of the khodila in detail, and then attempt to motivate the generality of these conditions.

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7 Itelmen in this regard contrasts with some other examples of epenthesis in text setting. Dell (2011) reports that schwa is epenthesized in Tashlhiyt Berber in order to provide a tone-bearing unit in syllables with consonantal nuclei, and Kiparsky (2020) reports schwa epenthesis in Urdu to provide a second mora where a short vowel cannot be lengthened. In both of these cases, epenthesis is invoked as a last resort, a reduced vowel that is inserted when the standard mapping algorithm fails to satisfy some criterion. In Itelmen, epenthesis is central to the text-setting algorithm and is a full vowel rather than schwa.

8 The etymology of the name khódila is obscure: there is an obvious parallel to the Russian word meaning ‘walk’ (past-tense feminine khódila, though note differences in stress and corresponding vowel quality), but whether this is merely coincidental is unknown.

9 The khodila is included in Degai 2014, and the audio recording with a transcription is available as supplemental material to this article and online at https://vimeo.com/150369369.
Consider the first line, repeated from above, with beats as indicated.

\[ (8) \quad || \quad \ddagger \ddagger \ddagger \quad | \quad \ddagger \ddagger \ddagger \quad || \quad \ddagger \ddagger \ddagger \quad | \quad . \quad || \]

O ses tas ja se na ǝ ze zank siːn.
Ostas jasna ǝzzank sin.
autumn clear outside is

The last word of the line is a single syllable held across a single long note (half note plus rest or dotted half note) in conformity with condition 3. The measure boundary (and in this case also the half-measure boundaries) aligns with word boundaries. Each of the first three half measures has three beats corresponding in each case to two syllables of spoken text. This mismatch is resolved in each case by epenthesis of the vowel [e] on the middle beat, which ensures that the right and left word edges align to the beginning and end of each half measure. The first word additionally has epenthesis of a consonant; o-se-tas would have also satisfied the conditions, and indeed occurs later in the song.

The doubling of /s/ here is somewhat anomalous, but not unique, and we return to this point below.

The second line of text shows additional points.

\[ (9) \quad || \quad \ddagger \ddagger \ddagger \quad | \quad \ddagger \ddagger \ddagger \quad || \quad \ddagger \ddagger \ddagger \quad | \quad . \quad || \]

La če čaχ či : i ηnŋ̂ q ǝnyx w ǝ ziːn.
Laččaχ čiŋnŋ̂ q aʔnxwǝzin.
sun.DIM beautifully shines

The second beat of the first and third half measures is again epenthetic [e]. For the first measure, as before, epenthesis on the middle beat allows a two-syllable word lač-čaχ ‘sun-DIM’ to fill a three-beat half measure, with right and left word edges aligned to beginning and end of the half measure. (Note that in the sequence /čč/ in the spoken language, each instance of /č/ is released—Itelmen does not have geminate /č/ and the sequence /čč/ arises, as here, only at morpheme junctures, as noted by Volodin 1976:56.) The adverb čiŋnŋ̂ q in the second half measure is also a two-syllable word with an internal addition to map to three beats, but rather than epenthesis of [e], it shows vowel doubling. This satisfies condition 2, but the added ‘vocalic element’ is a timing slot: a lengthening (or copy) of the preceding vowel, rather than an independent epenthetic vowel. The <.> in our notation is meant to indicate that this is not a single vowel held as a long note across two beats, but represents instead an instance of melisma, in that each beat has a distinct attack (even if both notes are the same). The word aʔnxwǝzin is three syllables in the spoken language, and in the song spans a full measure (six beats). The last syllable, since it falls at line end, is held over a full three-beat half measure (condition 3). The remaining two syllables are mapped to a three-beat half measure, with [e] epenthized on the second beat. Note that [e] occurs between /n/ and /xw/ in the four-consonant cluster /ʔnхw/.

In the next section, we discuss the conditions that determine the placement of the epenthetic vowel.

A final remark is due regarding this line. In aligning the text to beats, we have added an undertie indicating that the final /q/ of čiŋnŋ̂ q is syllabified as an onset to the (otherwise) vowel-initial word aʔnxwǝzin. This common property of connected speech motivates a qualification to condition 1: the borrowing of a consonant from a preceding word to serve as the onset of the next word (especially but not only when vowel-initial) is the only exception to the condition that edges of words and edges of

\[^{10}\text{In the recording, what we have transcribed [xʷ] is noticeably labial. There is variation in Itelmen: we find pronunciations along a continuum [x-xʷ-ɸ].}\]
In terms of syllables or syllable nuclei, there are no exceptions to the alignment condition. (Note also that this resyllabification of coda to onset happens only at the line-internal measure boundary and never at line end, that is, never across lines.)

The conditions just presented represent the core paraphonology of the Itelmen khodila. There are fifty-two lines of text. Fifty of these end in a single syllable held over the last three beats (we discuss the two outliers below). Excluding the last half measure of each line, there are then 156 non-line-final three-beat half measures. Of these, 148 (95%) have either epenthesis (eighty-five occurrences) or vowel lengthening (sixty-three occurrences) on the second beat, in the manner just seen.

We turn next to more careful scrutiny of condition 2, the conditions for epenthesis versus lengthening, and the placement of the epenthetic vowel. We then discuss the few apparent deviations from the system we have outlined.

2.3. The Second Beat: Epenthesis versus Lengthening. The reader may verify in Appendix A the eighty-five instances of epenthesis and sixty-three instances of vowel lengthening on beats 2, 5, and 8. The choice between epenthesis and lengthening is, in the significant majority of cases, easily predictable on phonological criteria. With a few qualifications and exceptions the following holds: if the first syllable is closed, then a vowel is epenthesized after the first consonant of the intersyllabic cluster. If the syllable on the first beat is open (there is only a single consonant between the first and second syllable), then the vowel is lengthened or doubled. As noted in the introduction, (spoken) Itelmen has no vowel length or syllable weight contrast. Examples of epenthesis are given in 10, and vowel lengthening (with (.) or without (:) a separate attack) is illustrated in 11. In these examples, the first column is the spoken form, and the middle column the khodila form; the third column indicates morpheme boundaries for reference—as far as we can tell, morpheme boundaries are irrelevant to the algorithms discussed here (for glosses, see the full text in Appendix B and the supplemental material).

(10) Epenthesis

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<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>a.</td>
<td>ǝzzank</td>
<td>ǝzǝzank</td>
</tr>
<tr>
<td>b.</td>
<td>laččаχ</td>
<td>laččаχ</td>
</tr>
<tr>
<td>c.</td>
<td>manx'аl</td>
<td>manx'аl</td>
</tr>
<tr>
<td>d.</td>
<td>txatxank</td>
<td>txatxank</td>
</tr>
<tr>
<td>e.</td>
<td>Qečzumsxanke</td>
<td>Qečzumsxanke</td>
</tr>
<tr>
<td>f.</td>
<td>ipɬχе</td>
<td>ipɬχе</td>
</tr>
<tr>
<td>g.</td>
<td>аʔnx&quot;sazin</td>
<td>аʔnx&quot;sazin</td>
</tr>
</tbody>
</table>

(11) Lengthening

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>a.</td>
<td>ĉ'i/neνq</td>
<td>ĉ'i/neνq</td>
</tr>
<tr>
<td>b.</td>
<td>xinen</td>
<td>xinen</td>
</tr>
<tr>
<td>c.</td>
<td>xo.оdil</td>
<td>xo.оdil</td>
</tr>
<tr>
<td>d.</td>
<td>li:lek</td>
<td>li:lek</td>
</tr>
<tr>
<td>e.</td>
<td>nлаleqes</td>
<td>nлаleqes</td>
</tr>
<tr>
<td>f.</td>
<td>kakaʔn</td>
<td>kakaʔn</td>
</tr>
<tr>
<td>g.</td>
<td>Seʔmanoke</td>
<td>Seʔmanoke</td>
</tr>
<tr>
<td>h.</td>
<td>mtklaaziʔn</td>
<td>mtklaaziʔn</td>
</tr>
</tbody>
</table>

11 For example, the final /k/ of the first measure in lines 27 and 29 appears to us to be released on the first beat of the following measure.

12 The suffix -ques here has not been identified, but the prefix and verb root are clear.
The deciding factor for epenthesis versus lengthening appears to be phonological: examples 10a–d show epenthesis in two-syllable words, with an initial closed syllable. As previously mentioned, whether the cluster is at a morpheme boundary is irrelevant. Example 10e is a four-syllable word, which spans a full measure (two half measures). Epenthesis occurs on beats 2 and 5, that is, between the first two syllables and between the last two syllables. Note that the more complex cluster [msx] is left intact: no epenthesis occurs in this cluster because it is at the boundary between the second and third syllables and is thus not medial in the half measure and therefore not subject to condition 2. Examples of this sort (we will see more below) suggest that epenthesis is driven by the mapping of syllables to beats, and not by phonological considerations such as cluster simplification.

Example 10f shows that the epenthetic [e] occurs after the first consonant of the cluster, even though [ple] is a well-formed onset; compare plekas ‘to turn off the road’ (the unmodified [ply] is also a well-formed onset, as in plxʔaʔn ‘friends’). Other examples showing epenthesis after the first consonant in clusters of more than two consonants include xaneqteqas, jaqestol, and qilebsezan. The two-syllable Russian borrowing pamjat ‘memory’ is parsed as pamejat, indicating that /mj/ is treated as a consonant cluster (as opposed, say, to treating /ja/ as a diphthong).

Khodila epenthesis differs from the regular phonology in at least two ways. First, the two differ in terms of the quality of the epenthetic vowel—as noted above, it is consistently [e] in the khodila but schwa in the regular phonology (see 5). It is tantalizing to speculate that the epenthetic vowel being [e] in the khodila may derive from the special status of this vowel in harmony. Itelmen has (or had) a version of the common Chukotko-Kamchatkan dominant-recessive harmony: underlingly recessive vowels {i, e, u} change to the corresponding dominant vowels {e, a, o} if there is a dominant vowel anywhere in the word. On the surface, full (nonschwa) vowels in any given word are thus either all recessive or all dominant. Since [e] occurs in both series (as the dominant counterpart to /i/ and as the recessive counterpart to /a/), this is the only full vowel that could be epenthesized to any word, whether dominant or recessive, without violating harmony on the surface.13

Second, comparison of the two columns in 10 shows that the paraphonological epenthesis in the khodila consistently targets positions where there is no epenthesis in the regular phonology. Example 10g shows moreover that the regular phonological schwa epenthesis described in the introduction (applying cyclically as this is a verb; see n. 5) feeds the khodila algorithm. That is, the khodila algorithm takes as its input the output of regular phonology, including schwa epenthesis.

We note that by consistently epenthizing after the first consonant of a cluster, regardless of the cluster’s complexity, the result is that the first syllable of every half measure is open in the khodila, regardless of whether the corresponding text syllable is open or closed.

The examples in 11 all have vowel lengthening rather than e-epenthesis. (We postpone until the next subsection a discussion of what determines whether lengthening will include a separate attack (. vs. :).) In all of these, in contrast to the examples in 10, the first syllable in the spoken form is open. Comparison of 10g and 11g illustrates

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13 This is an oversimplification to some extent, not least in that vowel harmony in contemporary Itelmen has become morphologized and is no longer a productive phonological process (Asinovsky & Volodin 1987, Bobaljik 2018).
the special status of the glottal stop, which is not treated as a consonant in this computation. In 11g, the sequence \( /seʔma/ \) is treated as having an open syllable, that is, only a single intervocalic consonant. Likewise, in 10g the location of epenthetic \([e]\) conforms to the established generalization (after the first consonant) only if the glottal stop is not counted. This behavior of the glottal stop is systematic in the khodila and accords with its limited phonological distribution in the language (independent of the khodila).14

Example 11h reinforces the point made discussing 10e: epenthesis versus lengthening is determined uniquely by the phonology of the juncture between the first two syllables, and not by overall optimization. The first two syllables of the word in 11h are \( mtkla.\). One might think that the initial cluster would be a prime target for epenthesis, but since the first syllable is open, lengthening applies instead, yielding a complex cluster of four consonants followed by a long vocalic sequence. The form \( txsaqzaxin \) in line 31 in the full khodila makes the same broad point: epenthesis breaks up the two consonants between the first two syllables, leaving the much more complex initial cluster untouched: \( txa.qe.za.xi::n \).

Some discussion is in order regarding geminate consonants. A complete list of examples in the khodila where the contemporary spoken language has geminate consonants is given in 12. (As noted above, \( lаččaχ \) from 10b is not a geminate, since the two affricates, which span a morpheme boundary, are separately articulated and released; see also Volodin 1976:56.) Interestingly, two of these examples involve lengthening and one involves epenthesis.

\[(12)\]
\[
\begin{align*}
\text{a. } & ǝzzank \quad ǝζzank/ǝzzank \quad ǝzza-nk \quad \text{ln 1, 9, 27, 29, 31} \\
\text{b. } & unʲnʲaʔnʲč \quad u:nʲaʔnʲč \quad unʲa-ʔnʲ-č \quad \text{ln 33, 35} \\
\text{c. } & spǝllǝzin \quad spǝllǝzin \quad spǝl-ǝz-in \quad \text{ln 10}
\end{align*}
\]

In the examples in 12b–c the intervocalic geminates behave as if they were single consonants, and thus the first vowel is lengthened. This makes sense from the perspective of Itelmen phonology. Volodin (1976:56) notes that gemination of a single intervocalic consonant in roots is optional and shows interspeaker variation, which accords with our observations as well. The root in 12c is underlyingly \( /sp(ǝ)l-/ \), with a single \( /l/ \) as seen in the noun \( spǝl \) ‘wind’, as well as in other forms of the verb, such as infinitive \( spǝlkaz \) ‘to blow (of wind)/to be windy’. We follow custom and the native-speaker intuition of the fourth author in transcribing a geminate in the present-tense forms of this verb, but if we analyze 12b and 12c as phonologically having only a single underlying intervocalic consonant, then lengthening rather than epenthesis is as predicted.

We might then leave the epenthesis in 12a as a result of the optionality of intervocalic gemination.15 However, Bobaljik 1996a notes that the appearance of initial schwa in this form (for which there is no variation across speakers) is predicted if the gemination in this root is underlying or lexical (in contrast to 12b–c). A single \( /z/ \) would not be expected to trigger schwa epenthesis and could surface as \( *zank \), which

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14 Among the few authors who have discussed it, there has been some disagreement as to whether what is written as a glottal stop is phonemic or suprasegmental. See the discussion in Volodin 1976:34–39 and the brief remark in Georg & Volodin 1999:24, n. 14. In any event, it evidently does not ‘count’ as a consonant for the purposes of determining the position of epenthesis in the khodila.

15 Comparison of just the (a) and (b) examples might suggest that lengthening before a geminate is preferred, but that pressure to avoid lengthened schwa leads to epenthesis in 12a. Example 12c speaks against this (if it is accurately transcribed—see main text), since it has a lengthened schwa.
is unattested. In sum, although only three word forms are at issue, if the underlying forms for the words in 12 are as given in the third column (with schwa potentially epenthetic in all instances; see Bobaljik 1996a), then there is no special behavior of geminates with respect to the paraphonology of the khodila and they conform to the overall pattern identified here.

Note finally that the independently observed optionality of gemination might shed light on the variable behavior of the verb keleziʔn, which is sung three times with epenthesis and repetition of the /l/ as if it were geminate: ke:leziʔn, and four (or five) times with vowel lengthening: ke:leziʔn/ke:leziʔn, as if the /l/ were not geminate. See §3.2 below.

The account we proposed above will extend, with one exception, to a sequence that spans a word boundary internal to a half measure: for example, when two monosyllabic words occur in the same three-beat measure. In 13a, there is a single intervocalic consonant (ignoring the glottal stop); thus beat 2 is realized as lengthening.16 In 13b–d, the spoken form has a cluster spanning the word boundary, and thus [e] is inserted after the first non-glottal element in the cluster.

(13) a. tiʔn i  tiʔn i
    b. qaʔt xej qaʔte xej
    c. qaʔt lem qaʔte lem
    d. ijanal me i ja nale me

The sole exception in this regard is given in 14. It occurs three times in the khodila, once with unexpected epenthetic [i] in place of [e] (see §3.1).

(14) xaɬɛ me xaɬɛ me

An alternative to treating 14 as exceptional would be to posit that the epenthetic vowel is inserted at a word boundary, if there is one. In addition to 14, this would cover 13b–c, while 13a indicates that lengthening is preferred to epenthesis, where the condition is met.

Together, e-epenthesis after the first consonant of a cluster and vowel lengthening in an open syllable constitute a full account of 134 text-to-song deviations, or 85% of the deviations in the non-line-final measures. We turn now to the remaining cases and anomalies.

2.4. Types of lengthening and melic templates.17 The preceding discussion identifies the phonological factors that determine whether the vocalic element added to the second beat of nonfinal half measures under condition 2 will be realized as epenthesis or lengthening. We now turn to whether lengthening will be realized as a long vowel (V:) or as a melisma—a series of two identical vowels, with a ‘double attack’ (V.V).

Here, the deciding factor is melodic, rather than phonological. To see this requires a brief elaboration of the musical character of the khodila.

As mentioned above, the khodila contains fifty-two lines, each of which is divided into two six-beat measures (each of which is further divided into two three-beat half measures). The scoring of the first four lines is presented in Figure 1.

---

16 If condition 2 is to be stated as making reference to an open syllable, this is calculated here after the coda /n/ resyllabifies as onset of the following /i/.

17 We are very grateful to participants at the MIT Phonology Circle meeting for the suggestion to investigate the relationship of lengthening types to pitch and melody, and to an anonymous referee for extremely helpful proposals regarding the melic templates discussed in this section.
With very few exceptions, which we discuss as ‘intrusive stanzas’ below, these four lines are representative of the entire khodila in the following ways.

(15) Khodila melodic structure (first pass)
   a. The first two beats of the first half measure of every line start with the same two notes (G).
   b. The last three beats of every line are a single note held for three beats (or sometimes two beats and a pause).
   c. The first two beats of the central half measures—that is, beats 4–5 and 7–8—show an alternating pattern.
      (i) In odd-numbered lines, beats 4 and 5 are sung on the same note, and 7 and 8 show a rising progression.
      (ii) In even-numbered lines, beats 4 and 5 show a rising progression, and 7 and 8 are sung on the same note.
      (iii) When beats 4 and 5 are sung on the same note, beat 5 may be split into two eighth notes, with a lower note on the upbeat of beat 5 (as in line 1).

Line 4 in Fig. 1 is, as it happens, the only exception to generalization (c): beat 4 repeats the note from beat 3, and the rise that ‘should’ be on beats 4 and 5 occurs instead over eighth notes on beat 5. Otherwise, the alternating pattern as described is exceptionless in the core khodila. The exceptions are in the first or final half measures of lines in what we term the ‘intrusive stanzas’ (lines 19–26, discussed below).18

Now, the generalization about lengthening is as follows.

(16) a. If an open syllable is lengthened across two different notes, each receives a separate attack.
   b. If an open syllable is lengthened across the same note, the vowel is sung as long.

18 The first beat is skipped at the beginning of lines 21, 25, and 45. Line 19 has an extra transitional beat (a 7/4 measure) introducing the intrusive stanzas; when that is set aside, line 19 is regular.
The generalization in 16 accurately describes sixty-one of sixty-four instances of lengthening in the khodila, solely in terms of the musical structure. Two of the remaining instances are instances of 15c(iii), where there is a note transition on the upbeat of beat 5, not falling under 16: in one case there is a second attack (line 45), and in one case there is not (line 17). The only clear exception to 16 is in line 3, where ĉ'i.ïmęŋ is sung with a second attack but no change in note, although as this is a word-for-word repetition of the preceding line, we may suspect some influence from line 2 in this occurrence.

In other words, there is an interplay of different types of information regarding the middle beats of each of the first three half measures on any line. These are always subject to condition 2: a vocalic element is added. For any given word, whether the first syllable is open or closed normally determines whether the additional element will be realized as epenthesis or lengthening, with the type of lengthening for open syllables determined by the melodic condition in 16.

Up to this point, we have been concerned with understanding the phonological deviations between words as spoken and words as sung, which the conditions above describe. A referee insightfully suggests that there may be an additional layer of generalization, corresponding to what Dell (2015) calls melic templates (see also Dell & Halle 2009), analogous to metrical templates in verse, which, in the present case, impose further generalizations on linguistic choices. For example, under the analysis we have presented, the third half measure of an odd line and the second of an even line have a rising note progression, and should show either epenthesis or melisma, but not lengthening. This is correct for the core khodila, but, as the referee observes, the distribution of epenthesis versus melisma is different in the two positions: in the odd third half measure the ratio of epenthesis to melisma is 19:3 (86% epenthesis), whereas in the even second half measure it is 12:9 (55% epenthesis). Similarly for the second half measure of odd lines and third of even lines: nineteen of the twenty-two odd-line second half measures have epenthesis (86%), but only ten of twenty-two (45%) of the even-line third half measures do (the rest, with two exceptions, have lengthening, as expected). Table 1 provides a synopsis of the outcome of condition 2 by line and half measure for the core khodila, excluding the final half measure of each line (which is not subject to condition 2).

<table>
<thead>
<tr>
<th>LINE</th>
<th>1/2 MEAS</th>
<th>PROCESS</th>
<th>TOTAL</th>
<th>% EPENTH</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>EPENTH</td>
<td>MELISMA</td>
<td>LENGTHEN</td>
</tr>
<tr>
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<td>1st</td>
<td>10</td>
<td>0</td>
<td>10</td>
</tr>
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<td>19</td>
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<td>1</td>
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<tr>
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<td>19</td>
<td>3</td>
<td>0</td>
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<tr>
<td>Even</td>
<td>1st</td>
<td>9</td>
<td>0</td>
<td>13</td>
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<tr>
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<td>2nd</td>
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<td>9</td>
<td>0</td>
</tr>
<tr>
<td>Even</td>
<td>3rd</td>
<td>10</td>
<td>0</td>
<td>12</td>
</tr>
</tbody>
</table>

Table 1. Distribution of epenthesis and lengthening by position (core khodila).

The referee suggests that, over and above our proposals giving the paraphonological output for a given phonological input, additional considerations may constrain the compositional choices of the words in the first place. As Table 1 shows, in most positions, the outcomes we expect are roughly evenly divided between epenthesis and one of the two types of lengthening, but in the noninitial measures of odd lines, lexical choices that support epenthesis are heavily preferred. We are grateful for this suggestion, but leave deeper exploration of this aspect of the account for future work.
Even without this additional musical depth, we take it that the robustness of the generalizations we have discussed speaks for itself—despite a few irregularities (not at all surprising in the context of a live performance), there is clearly a straightforward system governing the relationship of the spoken-language text to the language as sung. That relationship, as we have argued, is paraphonological: involving phonological generalizations over syllable structure, but distinct from the (normal) phonology of the language, and partly determined by the musical form.

3. Deviations from the basic schema. We now turn to a discussion of the exceptions to the general schema laid out in §2. The length of this section should not be read as giving an inordinate significance to the exceptions. It bears repeating that our proposal above accounts for the overwhelming majority of the text. The discussion of the exceptions takes somewhat longer than the discussion of the regular cases simply because the regular patterns are all alike, but every anomalous case is anomalous in its own way.

We divide the anomalous cases into two groups. For reasons that will become clear, we treat the ‘core’ khodila as comprising lines 1–18 and 27–52. Lines 19–26 differ from the remainder of the khodila in a number of ways, both in thematic content and in form, which suggests that they should be treated separately in our analysis. We label these as ‘intrusive’ stanzas and set them aside for a moment, returning to them for completeness in §3.4.

3.1. Syllable count mismatches. The algorithm we identified in §2 works neatly for mapping two syllables of text (a two-syllable word, or two monosyllabic words) to three beats (or in the line-final half measure, a single text syllable to three beats). Along with the alignment condition (condition 1), this makes it easy to map disyllabic words to any of the first three half measures, quadrisyllabic words to the first full measure, and trisyllabic words to the second full measure of a given line. Most of the text conforms to this pattern. But how are deviations from the optimal syllable count handled? There are a few possible answers.

One possibility is to augment the text. The interjection or particle me in lines 7, 13, 14, 37, 38, and 41 could be seen in this light: not part of the literal meaning of the text but added as a filler to boost the syllable count to two syllables of text per half measure. This raises an analytical question about the dividing line between text setting and composition that we put aside at the outset of the paper. Strictly speaking, text setting takes a previously given text and maps it to a given melody. In the Itelmen example we are considering, the rhythmic structure of melody is established in the first line, and thus all text is set to that melody. But the text is not given a priori—the composer is free to make text choices that will better fit the melody. In terms of analysis of the text-setting algorithm, it therefore seems reasonable to treat me as part of the composition of the text, rather than as a part of the paraphonology.

A different compensatory strategy is evidenced in lines 4 and 6 (the latter repeated as line 12). Line 6 is presented in 17.

```
(17) || stow:wa | lanke || ku:n?e | zi::?n. ||
stow-al-ank kunʔe-z-i<ʔ>n.
in the pine grove they are eating cones
```

The first word of the text has three syllables: stow:wa.lank—to too many for the first half measure, too few for the full measure. The first half measure incorporates the first two syllables; the first syllable is open, so beat 2 is a lengthening of the first vowel. For beats 4–6, this leaves only one syllable in the text form: lank (the /-l/ of the collective suffix plus the locative suffix -ank), which cannot be mapped to the three-beat half measure in
nonfinal position. Evidently, the solution is to epenthesize at word end: lan.\textit{ke}. This creates a two-syllable form, with a consonant cluster, which can be parsed according to the conditions in §2—the intersyllabic cluster can be mapped to the song form via \textit{e-epenthesis}: la.ne.\textit{ke}. We note in passing that the epenthesis of final [-\textit{e}] after the locative makes the form homophonous (in the Moroshechnoe dialect) with the dative-allative (cf. lines 8, 38/44 etc.), but in lines 6 and 12 certainly, and most likely in line 4, the locative, not the dative-allative, is the form required by the sense of the text: pine cones are eaten ‘in’ the grove, not ‘to’ the grove.\textsuperscript{19}

In only one example in the core khodila does the opposite occur, where the text has too many syllables. Line 27 repeats the opening line of the khodila, after the thematic self-referential digression. Rather than \textit{osetas}, however, the first half measure includes an additional discourse particle \textit{a}, perhaps motivated linguistically as a connective to return to the main theme after lines 19–26, but in any event adding a syllable. The singer accommodates this by failing to insert material on the second beat: \textit{a.os.tas}. While this is thus exceptional in terms of the general condition on the structure of the song, it allows for the addition of the particle without, as it were, missing a beat.

Note that a beat is skipped at the beginning of line 45, which is otherwise a repetition of line 44. Line 44 conforms to the overall schema: \textit{Seʔmanoke ‘to Semanok’} (or ‘to Semanom’) has four syllables, all open (discounting the glottal stop), and thus the first and third syllables are lengthened: \textit{Seʔman.o.ke}. A beat is skipped for unknown reasons at the start of line 45, and the singer commences on the second beat—failing to lengthen is the minimal change that preserves the remainder of the line. The first half measures of lines 27 and 44 are the only examples in the core khodila where there is a failure of condition 2.

3.2. \textit{Epenthetic C (eleven tokens)}. The attentive reader may have noticed that the first word of the song would be expected, by the conditions we have laid out above, to surface as \textit{osetas}, from underlying \textit{ostas} with epenthesis after the first consonant. Instead, it surfaces as \textit{osestas}, with expected \textit{e-epenthesis}, but also unexpected doubling of the first consonant.\textsuperscript{20} A total of six types (eleven tokens) of such additional consonant epenthesis are found in the text; the exhaustive list is given in 18.

\begin{center}
\begin{tabular}{lll}

(18) & SPOKEN & SUNG & EXPECTED \\
\hline
a. ostas & \textit{osestas} & \textit{osetas} & (2x) \\
b. keleziʔn & \textit{kelezi}:ʔn & ke(.):lezi:ʔn & (3x) \\
c. keleziʔn & \textit{keyelezi}:ʔn & ke(.):lezi:ʔn & \\
d. Qeqǝŋajanke & \textit{Qeweqǝŋajanke} & Qe(.):eqǝŋajanke & \\
e. sewer & \textit{sew}:rer & se.\textit{e.wer} & \\
f. skoro & kororo & sko:ro & \\
\end{tabular}
\end{center}

\textsuperscript{19} It is arguably possible to hear this as \textit{[sto:walanekaj]}, with final [-\textit{aj}] rather than \textit{[e]}. This does not substantively change the analysis. While Itelmen does have an augmentative suffix -\textit{aj}, that suffix occurs internal to case endings: \textit{met' sk'-aj-ank ‘bear-aug-loc’} (Volodin 1976:286), and so cannot be the correct parse of this form.

\textsuperscript{20} We cannot exclude the possibility that the underlying form is \textit{ostas} with a geminate /s/ (in which case it would be in no way special). Although this seems unlikely to us, this word was not widely known or otherwise attested in extant word lists and texts.

\textsuperscript{21} It is possible that this form is a disfluency and recovery in performance. Impressionistically, it sounds as if the singer sung \textit{se.wer} on the first two beats, missing out epenthesis on the second beat, and then repeated the second syllable to compensate so as to then start the next half measure on the correct syllable. Since the composer-performer is deceased and there are no other recordings of this khodila, we have no way to confirm or exclude this conjecture.
Five of these forms show consonant epenthesis where vowel lengthening would be expected under the conditions we have described (we do not distinguish lengthening and doubling here). Three of these in fact surface elsewhere in the khodila in the expected forms: ke:lez:i:ʔn (lines 34, 36, 48), ke:lez:z:i:ʔn (line 49), and [sk]o:ro (line 31). Example 18c should perhaps be better seen as a particularly breathy second attack (.) of a doubled vowel. Note in this regard that the phonemic status of /ɣ/ is dubious in general: <ɣ(w)> is written intervocalically in some sources, where others transcribe a sequence of two individually articulated vowels: for example, for ‘back, spine’ we find qayʷa[ɬ] (Volodin 1976:62) and qayːa [Olrova as cited in Volodin et al. 2021] but also k'â[ɬa] (Volodin & Khaloimova 2001:38) and k'â:ə (Bobaljik 1996b:16). All of these may represent an approximant [ɰ]. Otherwise /ɣ/ does not occur as a native phoneme. Note that the final two forms in 18 are Russian borrowings (sewer ‘north wind’ from Russian sewer ‘north’, and skoro ‘quickly’ from Russian, with meaning unchanged).

Note also that four of the nine tokens in 18 are the single lexical item ke(l)leziʔn ‘they are calling’. Recall from above that a single intervocalic consonant in the root is optionally geminated. In the handful of examples we discussed in §2, lexical items appeared to behave consistently as if they did or did not have an underlying geminate. But if that optionality can interact with the khodila paraphonology, we expect precisely the variation we see with ke(l)leziʔn.

In sum, although the forms in 18 are mildly anomalous in light of the system we proposed in §2, the deviations are minor and, with the exception of the intrusive [w] in 18d, can be understood in one way or another as reflecting independently justifiable aspects of Itelmen phonology.

3.3. OTHER MINOR DEVIATIONS. For completeness, we consider here a small residue of final instances in the core khodila where the text as performed is slightly different from what our analysis would have predicted.

EPENTHETIC V ≠ [e]. In three word forms, an epenthetic vowel occurs in the expected position, but is not [e]. A complete list is given in 19.

(19) a. xaɬ.či me ln 7
b. i.piːɬxe ln 7, 13, 47
c. ǝ.zǝ.zank ln 27, 29

In 19b–c, the unexpected vowel takes on the quality of the immediately preceding vowel. Example 19a occurs in line 7 and is immediately followed by a second instance of unexpected [i]: xaɬči me ipitxe!. All of these forms occur elsewhere in their expected form with [e], for example: xaɬče me ipelxe! (line 37), æezank (line 1). Since there are so few examples of this deviation, we assume that these are colorings of the otherwise expected vowel under the influence of neighboring vowels, plausibly a matter of online performance (note that this is distinct from the phonological vowel harmony process observed throughout Chukotko-Kamchatkan, mentioned in §2.3 above).

EXTRA EPENTHESIS. In lines 39/41 (20a) and 44/45 (20b), epenthesis occurs twice in a single half measure: once as predicted (on the second beat), and once as an extra, spurious epenthesis occurring on the last off-beat of the penultimate half measure (this also happens in lines 19/21, discussed in §3.4 below). We have no account of this irregularity.22

22 The verb stem in the second example is xamne- (or xaʔmne-) in all modern attestations, although it occurs with a schwa between /m/ and /n/ in Tiushov’s 1906 word list.
Unexpected lengthening. The word $a\tilde{n}x^{w}sz\ddot{\imath}n$, discussed above, occurs at the end of six lines of text. Five of these are realized, in conformity with §2, as $a\tilde{n}ex^{w}sz\ddot{\imath}::n$, but one occurrence makes use of lengthening, preserving the cluster unbroken: $a:\tilde{n}x^{w}sz\ddot{\imath}::n$. Lengthening in place of epenthesis also occurs in $e:\mathcal{E}q\tilde{\mathcal{E}}q$ (line 17); the same word occurs with (expected) epenthesis instead of lengthening in the following line: $ese\mathcal{E}q\tilde{\mathcal{E}}q$.

In one instance in the core khodila (and two in the intrusive stanzas), a nasal consonant is lengthened where the algorithm would have yielded epenthesis after the nasal, as in 21.

(21) xânlawulk xânlawu::lk ln 46

Nothing that we know of would have prevented epenthesis here; compare line 43 where epenthesis occurs in the same phonological environment: xânlele → xânelalek.

In sum, our analysis accounts, with a few simple conditions, for the majority of the phonological deviations observed between text and song. We have, for the sake of completeness, provided an exhaustive discussion of the remaining unpredicted deviations in the core khodila. As seen, they are few in number and minor in character, and we suggest that it is reasonable to expect minor deviations from the intended or expected pattern as part and parcel of a live performance.

3.4. Intrusive stanzas: lines 19–26. A shift of audience frame and mode of consciousness reflected may also shed light on the anomalies in lines 19–26, which we have called the ‘intrusive stanzas’. In terms of their linguistic content, these lines constitute a marked departure from the rest of the text. Thematically, a traditional khodila is ‘in the moment’, describing the singer’s emotions, impressions, desires, and the like (Porotov 1968). The mode of consciousness expressed is akin to what Wallace Chafe calls the ‘immediate mode’ in discourse. In this case, the singer speaks as a ‘representing consciousness’ recounting the experience of a ‘represented consciousness’ perceiving, acting in, and evaluating the environment in which it is immersed (Chafe 1994:196–98). The khodila described here, with the exception of lines 19–26, is in essence a series of riffs on ‘oh, what a beautiful day’. Lines 19–26, given in 22, by contrast exhibit a reflexive mode of consciousness, a kind of self-referential meta-comment on and in the khodila.

(22) I have sung this khodila
to the memory of the Itelmens.
Maybe someday you will remember me
and sing this khodila.

The first-person singular ‘I’ consolidates the representing and represented consciousnesses into one. The shift from first person to second-person address presents a shift in audience frame from an imagined friend in potential dialogue to an active listener to the song. ‘You’ in this case could be the person recording or someone listening to the recording in the future. In terms of form, the lines are distinguished by text-to-song deviations not seen elsewhere in the song and by code-shifting: parts of some of these lines are sung in Russian—not merely (as elsewhere in the text) with the use of Russian borrowings in Itelmen, but with fully inflected Russian forms. Moreover, some of these lines deviate musically from the schema laid out in 15. We contend that these considerations justify treating these eight lines differently from the remainder of the khodila.
More specifically, we may wonder whether these lines alone were a spontaneous addition: certain elders are recognized for their skill at khodila composition and singing and are asked to perform their songs at gatherings. There is therefore some scope for refinement over multiple repetitions, whereas an on-the-spot addition could conceivably lead the singer into unanticipated challenges in mapping syllables to beats, of the kind that in the core text could be filtered out by text revisions over repeated performances. This seems to us to be a plausible explanation for the deviant form of this passage, but we will never know for sure, as, sadly, the participants in the recording session have all passed away in the interim.

As the reader may verify in the appendices, lines 19–26 represent four lines of text, repeated, following the schema: ABABCDCD. Lines 20/22 and 24/26 are entirely in Itelmen and respect the schema discussed above, with the interesting exception that tɬǝŋ‘I sang (it)’ has lengthening of the nasal, rather than epenthesis (cf. 21 above). Lines 23/25 mix Russian možet (bytʲ) ‘maybe’ and Itelmen. Again the Itelmen portions conform to expectations, but the Russian borrowing is treated differently in the two occurrences. In line 23, the element bytʲ is omitted, leaving a two-syllable word with an open first syllable, lengthened, as expected. But in line 25, the full Russian expression možet bytʲ ‘maybe’ is squeezed into the first half measure, here with a skipped first beat, then a contracted second syllable.

The most interesting lines, from the perspective of the paraphonological analysis we offer here, are lines 19 and 21, which are almost entirely in Russian.

(23) Line 19
<e> xu tiʔn na | pameja tʲ || ite[l]e | me.enam ||
E xu tiʔn na pamja tʲ itel’menam
INTJ PRTC this to memory Itelmen.PL.DAT

(24) Line 21
__ i na | pamejatʲ || i.te[l]e | me.enam ||
i na pamja tʲ itel’menam
and to memory Itelmen.PL.DAT

Line 19, which opens the intrusive stanzas, begins with a kind of false start—an anomalous four-beat half measure with each syllable mapped to a beat. The first three of these syllables are interjections and discourse particles (including the demonstrative tiʔn, which sometimes has this ‘filler’ function; compare Russian èto samoe or Mandarin nei ge). If the interjection e and corresponding beat are set aside, the first three half measures of line 19 are well formed. We suggest, then, that this should be seen merely as a kind of hiccup in the transition from the core khodila into the intrusive stanzas. Line 21 repeats the essential content of line 19, but without the additional syllable. All of the filler elements are replaced with the Russian/Itelmen conjunction particle i ‘and’, discourse particles other than i are omitted, and the line starts on the second beat after a pause.

The remainder of the line is in Russian, including lexical items and grammatical elements such as the preposition na and the dative plural case marking on itel’menam ‘Itelmens’. The Russian word pamja tʲ ‘memory’ is nicely incorporated into the khodila schema (disyllabic word as a three-beat half measure, with epenthesis), but this leaves itel’menam, which has too many syllables for the final measure. This word is treated differently in its two occurrences. In line 21, the first syllable, being open, is subject to vowel lengthening/doubling, but this is then followed by a mapping of two syllables [te.l[e]] to a single beat, with [l[e]] sung on the off-beat. In both lines 19 and 21, [menam]
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has two text syllables in a position that ‘should’ be a single, long note. Instead, the non-final schema is used here: two syllables of text are mapped to three beats via lengthening/doubling of the first vowel.

Musically, lines 20 and its repetition 22 are surprising. From the perspective of the melodic structure in 15, these are the only instances of what we might call departures of commission.\(^{23}\) These lines start on the wrong note and have a rising note progression over the first two beats, a pattern that otherwise occurs only in medial half measures. They stand out sharply against the otherwise robust pattern of beginning every line with two consecutive G-notes.

The short passage in lines 19–26 is thus quite anomalous from the perspective of the account we have presented here. We suggest, though, that the anomalous nature in terms of melody and text setting is matched by, and thus potentially understandable in terms of, both a divergence in content from the rest of the khodila and the fact that the most striking divergences from expectations are in the portions sung in Russian. We suggest, tentatively, that this may reflect a late, perhaps even unplanned, addition to the khodila—a self-reflective meta-comment on the khodila tradition for a future audience.

4. Conclusion and future directions. In this paper, we have presented a detailed examination of a khodila in Itelmen, a language unrelated to any previously discussed in the literature on text setting. One element that the Itelmen material contributes to this literature, if our analysis is on the right track, is that constituency matching (i.e. prioritizing the alignment of linguistic constituent edges to metrical boundaries) may be of more importance than metrical prominence in some traditions. In the Itelmen case, the key observation appears to be that the canonical pattern is an attempt to align word boundaries with measures, while at the same time ensuring that the middle beats of each nonfinal three-beat half measure in a twelve-beat line (beats 2, 5, and 8) are epenthetic: in the vast majority of instances, this takes a two-syllable word and spreads it to fill three beats, while aligning right and left edges of the words with the edges of the half measure. We have argued that the relationship between text and song is thus systematic and rule- (or constraint-)governed, and for the vast majority of instances, describable in straightforward terms. Importantly, in our view, the rules, though stated largely in phonological terms, represent a paraphonological phenomenon in the sense of Kiparsky 1977. That is, the rules govern the phonology of this song genre and differ from the phonological rules of the (spoken) language. For example, both the quality and position of the epenthetic vowel differ from the regular phonology of Itelmen and are specific to the khodila genre. Nevertheless, the paraphonology is related to the regular phonology in interesting ways, as seen here (arguably) in the way that optional gemination of intervocalic consonants interacts with epenthesis and lengthening, and in the way that the glottal stop is not treated as a full consonant in determining the position of epenthesis.

Keeping to the constraints of the research report format, we have restricted ourselves to a close description of this particular instance of verbal art, drawing out the generalizations as explicitly as possible. Many questions remain for future work: we have refrained from implementing our phonological analysis in formal frameworks, for example, and as a referee noted, more could be done in terms of a musical analysis. Another question to be asked is the degree to which the details of this khodila are characteristic of the genre. Sadly, this may be unanswerable. Extremely few khodilas have

\(^{23}\) As contrasted with ‘departures of omission’ in lines 21, 25, and 47, where the first beat is simply missing.
been recorded, and the tradition, with the language, is severely endangered. There may no longer be any ‘experienced listeners’, in the sense of Lerdahl & Jackendoff 1983, who are able to judge the degree to which a given piece fits the genre. By the twentieth century, all speakers of Itelmen were bilingual, and for most (eventually for all), Russian was the dominant daily language. Some recordings of songs described as khodilas are, it appears to us, influenced by Russian musical traditions, and indeed some of the performers had formal Russian musical training. Nevertheless, although we cannot say with any certainty what the specific details of the tradition are, the characteristic role of epenthesis was already noted by Steller some three centuries ago:

Since the text does not accord conveniently with the melody in terms of syllables, they thus put in false and meaningless syllables, which gives their music a different character. (Steller 1774:336, translation ours)²⁴

Similarly, Degai (2012) also notes the prevalence of epenthesis and lengthening in a khodila contemporaneous with the one we examine here, commenting that ‘[t]he syllable structure of the song lives independently of the beat or meter. A syllable, two syllables, a single vowel or a consonant can equally use the space of one beat’.

In prioritizing constituency matching, the Itelmen khodila differs from more widely discussed types of text setting in the literature, such as that described for Indo-European languages (see, among others, Dell & Halle 2009, Hayes 2009, Kiparsky 2020), where alignment of linguistic prominence (stress) and metrical prominence plays a central role. While it is not our aim within the limited scope of this research report to offer a typology of text setting, we note that constituency matching, rather than stress, plays a role in the genre described for Kaytetye (Australia) in Turpin 2007, 2008. A referee also calls our attention to some similarities with karintaa chant among the Arawakan Nantis of Peru, described in Michael 2019. The key similarity is the use of epenthesis and lengthening to meet a rigid seven-mora requirement per line; a key difference, however, is that, as we understand the description, epenthesis and lengthening are among possible adjustments for lines that do not intrinsically meet the seven-mora requirement, whereas in Itelmen, the addition of a vocalic element is a central component of this verbal art: words that would intrinsically fit a three-beat half measure are avoided, in order that the second beat may almost always be an addition to what the spoken phonology would provide. A somewhat closer similarity, perhaps, occurs in Toda (Dravidian) song, for which Emeneau’s (1966) description says that ‘[m]any of the song-units are padded to achieve the length of three syllables’. Among the various ways of padding, ‘[a] long vowel is broken into two vowels of the same quality’ and ‘[m]any song-units that consist of two monosyllabic words of prose are filled out to the song-unit norm of three syllables by insertion of /e/ between the two words’ (pp. 325–26).

As a final question, we might, in light of the variety of observed traditions of verbal art, ask (as a referee does) what role (if any) a language’s phonological characteristics may play in determining the type of text-setting patterns it will have. One of the motivations for the current project was the question of whether Steller’s ‘syllabæ spuriæ’ were motivated by a need to break up complex consonant clusters to facilitate singing (which turned out not to be the case). Why, then, does the Itelmen khodila make use of different mechanisms for text-to-tune mapping? There is no evidence of syllable weight contrasts in Itelmen (there is no length contrast, for example), and it is not clear that the language

²⁴ ‘Weil aber der Text nicht füglich mit der Melodie den Silben nach übereinkommt, so setzen sie falsche und nicht bedeutende Silben darzwischen, welches also eine andere Art ihrer Musik abgibt.’
has a linguistic stress system to speak of, though this has not been the subject of careful investigation.25 If it lacks linguistic stress, then alignment of metrical and linguistic prominence would not be an available strategy for a text-setting type in this language. In any event, we leave this as an open question, in the hope that our more modest aim in this research report, namely providing a close analysis of the verbal art of one type of Itelmen khodila, may be of future use in, for example, fleshing out the typology of paraphonology in the future.

APPENDIX A: KHODILA TEXT

The complete text of the khodila follows. In each line, the left-hand column provides the Itelmen text with a word-by-word rough gloss, and the right-hand column shows the corresponding line as sung in the khodila, with breaks between beats (|) and half measures (||) indicated. A tie bar indicates a final consonant that is syllabilified as the onset of the following syllable. Epenthetic segments are indicated in red.

| 1. | Ostas | jasna | ãzzank | sin | O|se|stas | || | ja|se|na | || | æ|ze|zank | || | sin |
| 2. | Lačča | č’njax | a’nx*|sazin | sun.DIM | beautifully | shines | La|če|čax | || | č’il|i|naxq | || | aʔ|nxe|x*so | || | zin |
| 3. | Lačča | č’njax | a’nx*|sazin | sun.DIM | beautifully | shines | La|če|čax | || | č’il|i|naxq | || | aʔ|nxe|x*so | || | zin |
| 4. | Eččenjaxn | a’nx*|sazin. | cliff.DIM | shines | E:|ʔ|le | || | čye|nejke | || | a:|ʔ|nx*so | || | zin. |
| 5. | Kaka’n | esčaq | keleziʔn, | nutcrackers | strongly | call | Ka|j:|kaʔn | || | e|se|čaq | | ke|le|le | || | ziʔn, |
| 6. | Stowalank | kunʔezriʔn | pine.grove.LOC | eat.cones | Sto|j:wa | || | la|ne|ke | || | ku|j:|nʔe | || | ziʔn |
| 7. | Xalč me, | ıpļe, | xānlalek. | hey | PRRC | friend.VOC | let’s.walk | Xal|ɛ|i | me | | ıp|li|ye | | xä|ne|la | || | lek. |
| 8. | Qeqaʔjanke | xānlalek. | Qeqenaj.DAT | let’s.walk | Qe|we|q | || | ɲaj|janke | || | xā|ne|la | || | lek. |
| 9. | Ostas | jasna | ãzzank | sin. | autumn | outside | is | O|se|stas | || | ja|se|na | || | æ|ze|zank | || | sin. |
| 10. | Sewer | č’nepq | spalssazin. | north[wind] | beautifully | blows | Se|we|r()r | || | č’il|i|nepq | || | spa|l|l|la | || | zin. |
| 11. | Kaka’n | esčaq | senzoziʔn, | nutcrackers | strongly | fly | Ka|j:|kaʔn | || | e|se|čaq | | se|ņe|zo | || | ziʔn, |
| 12. | Stowalank | kunʔezriʔn | pine.grove.LOC | eat.cones | Sto|j:wa | || | la|ne|ke | || | ku|j:|nʔe | || | ziʔn |
| 13. | Xalč me, | ıpļe, | xānqeqsqs. | hey | PRRC | friend.VOC | let’s.gather | Xal|ɛ|e | me | | ıp|li|ye | | xā|neq|te | || | qas. |
| 14. | Ijanal | me | xānqeqsqs. | arctic.raspberry | PRRC | let’s.gather | I:|ja | || | na|le | me | | xā|neq|te | || | qas. |
| 15. | Jaqstal | esčaq | keleziʔn, | gulls | strongly | cry | Ja|qe|s|tәl | || | e|se|čaq | | ke|y|e|le | || | ziʔn, |
| 16. | Tox|xanke | jajeqen | mtkałaziʔn | sand.LOC | there | eat.spent.fish | To|se|xank | || | ɡaj|eqen | | mtk|la|:|a | || | ziʔn |

25 Volodin (1976:73) reports only that syllables with a glottal stop are impressionistically accentually stronger than surrounding syllables; otherwise he perceives a plateau. Bobaljik and Wurmbrand (2001) report that amplitude peaks on the first syllable that is not an inflectional prefix and subsequently tapers off.
17. Jaqstǝl esčaq keleziʔn, gulls strongly cry

18. Tosxǝn kǝsčaq mtklaziʔn sand.LOC strongly eat.spent.fish

19. E xu tio n na pamjat' itel' menam so this to memory to.itelmens <e>

20. Xixen xodil tlǝŋqanǝŋ such khodila I.sang

21. I na pamjat' itel' menam and to memory to.itelmens

22. Xixen xodil tlǝŋqanǝŋ such khodila I.sang

23. Možǝt, txatxǝk txilǝxkmanq, may someday you.will.remember.me

24. Tiʔn i xodil caqalasx, this and khodila you.will.sing

25. Možǝt byt', txatxǝk txilǝxkmanq, may be someday you'll.remember.me

26. Tiʔn i xodil caqalasx, this and khodila you.will.sing

27. Osta'ntǝxǝk jasna sin. autumn outside clear is

28. Mesjac č'ineq a'mnx'sezin. moon beautifully shines

29. Skoro azzǝn kǝsčaqazin. moon beautifully shines

30. Zora qaiʔ jej a'mnx'sezin. twilight already there shines

31. Skoro azzǝn kǝsčaqazin. moon beautifully shines

32. Zora qaiʔ jej a'mnx'sezin. twilight already there shines

33. Unqǝʔnǝh ᵐoʃe lej nǝʔneziʔn. birdies already also wake.up

34. Lilek č'ineq kelezi. willow.LOC beautifully calling

35. Unqǝʔnǝh qauʔ lej nǝʔneziʔn. birdies already also wake.up

36. Lilek č'ineq kelezi. willow.LOC beautifully calling

37. Xačč me, ipila, xǝndalek. hey PRTR friend.voc let's.walk

38. Seʔmanoke xǝndalek to.Semanok let's.walk

39. Nuxn me tǝsačax xǝnt'elqǝn, that PRTR path let's.cross

40. Manx'al i't'e nlàeqes. from.where once we.walked
Appendix B: Morphological parse of khodila text

We provide here a morphological parse of the text. We note for the sake of completeness that a handful of morphological forms are anomalous from the perspective of existing descriptions and our own notes. For example, the object agreement suffix -n in lines 39 and 41 surfaces where -čen would be expected in this dialect (-n occurs in this function in the Sedanka dialect). We have tentatively glossed the suffix -qes in lines 40 and 42 as the infinitive (normally -kas), though that is not expected here. Note also that the prefixes we gloss as ‘imperative’ following Georg and Volodin (1999:155) are part of a mood paradigm that is broader than imperative-hortative in the meanings it conveys. See Ono 2021:92–93 for a summary of previous terms. Ono labels this mood optative, though it clearly does also convey imperative meanings.

1. Ostas jasna ǝzz-ank s-in autumn clear outside-LOC BE.PRS-3SG ‘The autumn outdoors is clear.’
2. Lač-čaχ č’inǝŋ-q aʔnхws-ǝz-in sun-DIM beautiful-ADV shine-PRS-3SG ‘The sun is shining beautifully.’
3. Lač-čaχ č’inǝŋ-q aʔnхws-ǝz-in sun-DIM beautiful-ADV shine-PRS-3SG ‘The sun is shining beautifully.’
4. Eʔle-čy-enk aʔnхws-ǝz-in.cliff-DIM-LOC shine-PRS-3SG ‘It shines on the little cliff.’
5. Kaka-ʔn esča-q kele-z-i<ʔ> n.nutcracker-PL strong-ADV call-PRS-3<PL> ‘Nutcrackers are calling loudly.’
6. Stow-al-ank kunʔe-z-i<ʔ n
   pine-coll-loc cone-prs-3<pl>
   ‘They are eating pine cones in the pine grove.’

7. Xaɬč me,  ḵxan-lale-k.
   intj prtc friend-voc 1pl.imp-walk-1
   ‘Hey friend! Let’s walk!’

8. Qeqenaj-anke  ḵxan-lale-k.
   Qeqenaj-dat 1pl.imp-walk-1
   ‘Let’s walk to Qeqenaj!’

9. Ostas jasna azz-ank s-in
   autumn clear outside-loc be.prs-3sg
   ‘The autumn outdoors is clear.’

10. Sewer čineŋ-q spal-az-in.
    north.wind beautiful-adv blow-prs-3sg
    ‘A north wind is blowing nicely.’

11. Kaka-ʔn esča-q sež-zo-z-i<ʔ n,
    nutcracker-pl strong-adv fly-freq-prs-3<pl>
    ‘Nutcrackers are flying around.’

12. Stow-al-ank kunʔe-z-i<ʔ n
    pine-coll-loc cone-prs-3<pl>
    ‘They are eating pine cones in the pine grove.’

13. Xaɬč me,  ḵxan-qte-qǝs.
    intj prtc friend-voc 1pl.imp-gather-inf
    ‘Hey friend, let’s go gathering.’

    raspberry-ins prtc 1pl.imp-gather-inf
    ‘Let’s gather arctic raspberries.’

15. Jaq-stǝl esča-q kele-z-i<ʔ n,
    gull-coll strong-adv call-prs-3<pl>
    ‘The gulls are calling loudly.’

16. Tosх-ank χajqen mtklaa-z-i<ʔ n
    sand-loc there spent.fish-prs-3<pl>
    ‘On the sand there they are eating the spent fish.’

17. Jaq-stǝl esča-q kele-z-i<ʔ n,
    gull-coll strong-adv call-prs-3<pl>
    ‘The gulls are calling loudly.’

18. Tosх-ank esča-q mtklaa-z-i<ʔ n
    sand-loc strong-adv spent.fish-prs-3<pl>
    ‘On the sand they are eating spent fish very much.’

19. E  ḵxu tiʔn na pamjatʲ iteľmen-am
    eh so this to memory Itelmen-dat.pl.russian
    ‘So it is to the memory of the Itelmens,’

20. Xinen xodil t-baŋqaj-čen
    such khodila 1sg-sing-1>3sg
    ‘I have sung this khodila.’

21. I na pamjatʲ itelmen-am
    and to memory Itelmen-dat.pl.russian
    ‘And to the memory of the Itelmens,’

22. Xinen xodil t-baŋqaj-čen
    such khodila 1sg-sing-1>3sg
    ‘I have sung this khodila.’
23. Možет, txatxask txil-al-xkməŋ,  
    may someday remember-FUT-1SG.OBJ  
    ‘Maybe someday you will remember me,’
24. Tiʔn i xodil čaqaʔɬ-ʔal-sx.  
    this and khodila sing-FUT-2PL  
    ‘and you will sing this khodila.’
25. Možет bytʃ txatxask txil-al-xkməŋ,  
    may be someday remember-FUT-1SG.OBJ  
    ‘Maybe someday you will remember me,’
    this and khodila sing-FUT-2PL  
    ‘and you will sing this khodila.’
27. Ostas jasna ʔzz- ank s-in  
    autumn clear outside-LOC BE.PRS-3SG  
    ‘The autumn outdoors is clear.’
28. Mesjəc čiʔen-q ʔəmxʷse-z-in.  
    moon beautiful-ADV shine-PRS-3SG  
    ‘The moon is shining beautifully.’
29. Skoro ʔzz- ank txsa-qza-x-in.  
    soon outside-LOC dawn-DUR-FUT-3SG  
    ‘Soon it will be light out.’
30. Zora qaʔt yej ʔəmxʷse-z-in.  
    twilight already there shine-PRS-3SG  
    ‘The twilight is already glowing.’
31. Skoro ʔzz- ank txsa-qza-x-in.  
    soon outside-LOC dawn-DUR-FUT-3SG  
    ‘Soon it will be light out.’
32. Zora qaʔt yej ʔəmxʷse-z-in.  
    twilight already there shine-PRS-3SG  
    ‘The twilight is already glowing.’
33. Unʔnʔ-ʔni-ɬ qaʔt lem ʔənʔne-z-i<ʔ> n.  
    bird-pl-dim already also awake-PRS-3<pl>  
    ‘The little birdies are also already waking up.’
34. Lile-k čiʔen-q kele-z-in.  
    willow-LOC beautiful-ADV call-PRS-3SG  
    ‘In the willows (there) is beautiful calling.’
35. Unʔnʔ-ʔni-ɬ qaʔt lem ʔənʔne-z-i<ʔ> n.  
    bird-pl-dim already also awake-PRS-3<pl>  
    ‘The little birdies are also already waking up.’
36. Lile-k čiʔen-q kele-z-in.  
    willow-LOC beautiful-ADV call-PRS-3SG  
    ‘In the willows (there) is beautiful calling.’
37. Xəlɛ me, ʔpəʔ-e, xən-lale-k.  
    INTJ prtc friend-voc 1PL.IMP-walk-1  
    ‘Hey friend, let’s walk!’
38. Seʔməno-ke xən-lale-k  
    Semanok-dat 1PL.IMP-walk-1  
    ‘Let’s walk to Semanok (Semanom)!’
39. Nuʔn me ʔyas-čəx ʔənʔ-č’il-qzu-n,  
    that prtc road-DIM 1PL.IMP-cross-DUR-1PL>3SG  
    ‘Let’s take that path,’
40. Man-x’al iʔe n-lale-ques.  
    where-ABL once 1PL-walk-INF  
    ‘Along which we once walked.’
41. Nuʔn me tjas-čag xan-čel-qzu-n,  
that PRTC road-DIM 1PL.IMP-cross-DUR-1PL>3SG  
‘Let’s take that path,’

42. Man-x’ał i’te n-lale-qes.  
where-ABL once 1PL.walk-INF  
‘Along which we once walked.’

43. Malanəg-x’ał xan-lale-k,  
Malanjachq-ABL 1PL.IMP-walk-1  
‘Let’s walk across Malanjachq.’

44. Seʔmano-ke xan-xamne-k,  
Semanok-DAT 1PL.IMP-cross.pass-1  
‘Let’s cross to Semanok (Semanom)!’

45. Seʔmano-ke xan-xamne-k,  
Semanok-DAT 1PL.IMP-cross.pass-1  
‘Let’s cross to Semanok (Semanom)!’

46. Uwal-ačχ-ank xan-lawul-k.  
pass-DIM-LOC 1PL.IMP-sit-1  
‘Let’s sit on the pass.’

47. Qečiq, ipɬχ-e, q’-ilʔse-z-ǝn.  
well friend-voc imp-listen-PRS-2SG  
‘Listen well, friend!’

48. Č’inǝŋ-q jaq-stǝl kele-z-iʔn,  
beautiful-adv gull-collcall-PRS-3<pl>  
‘Gulls are calling beautifully.’

49. Č’inǝŋ-q jaq-stǝl kele-z-iʔn,  
beautiful-adv gull-collcall-PRS-3<pl>  
‘Gulls are calling beautifully.’

50. Qečzumx-anke senzo-z-iʔn.  
Qečzumx-DAT fly-PRS-3<pl>  
‘They are flying to Qečzumx.’

51. Č’inǝŋ-q jaq-stǝl kele-z-iʔn,  
beautiful-adv gull-collcall-PRS-3<pl>  
‘Gulls are calling beautifully.’

52. Qečzumx-anke senzo-z-iʔn.  
Qečzumx-DAT fly-PRS-3<pl>  
‘They are flying to Qečzumx.’

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