Text-setting in an Itelmen khodila:
A phonological analysis[1]

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Abstract 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, in that linguistic stress and metrical prominence play no discernable role. Instead, the driving force appears to be matching word edges to (half)-measure boundaries, resulting in predictable anaptyxis (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, 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 or more broadly epenthesis of phonetic material (consonants and vowels), for example, the word *jaqstəl* 'sea gulls' occurs in the khodila we discuss here as *jaqestəl*, 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, linguistic stress and metrical prominence play no role in the relevant algorithm. Instead, the

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driving force in the Itelmen khodila appears to be what Halle (2004) and Dell and Halle (2009) call constituency-matching, i.e., 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 languages like English, in 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.

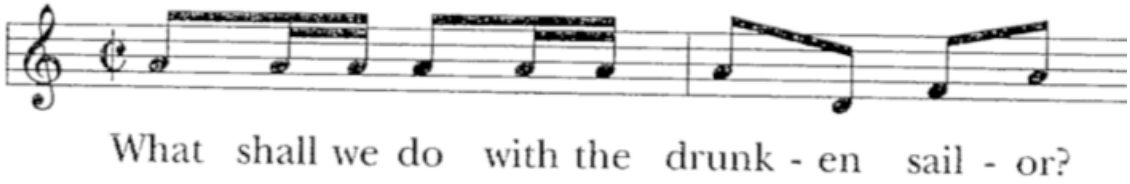
1.1 The problem: text-setting in an Itelmen khodila

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 4 strong beats, but the lines of text have varying numbers of syllables and the lexical stresses vary across lines both in 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.

(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 máke him báil her.

The canonical setting for (1a) is shown in (2) from Halle & Lerdahl 1993 (p.10). The lexical stresses fall on the strong beats, unaccented syllables fall on the off beats. Off beats are further sub-divided to accommodate additional unstressed syllables.

(2)



Lines (1b,d) differ from (1a) in having only three linguistic stresses. In order to preserve the 4-beat melody, syllables that would not be accented in speech are mapped to strong beats: *un.tíl* in (b) and *thére* in (d). 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 discernable role in text setting. There are no effects comparable to (1)-(2) that can be described in terms of a stress:meter mapping. Secondly, a striking feature of Itelmen khodilas is the apparent 'ornamentation' of the text through the addition of vowels and syllables, as commented on already by Steller (1774:336), who called them *syllabæ spuriæ*.[2] Example (3) presents the first two lines of the Zaporotskij khodila (the entire text is included as an appendix).[3] 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.[4]

(3) a.

Osestas	jasena	əzezank	si::n.
Ostas	jasna	əzzank	sin.
Autumn	clear	outside	is

b.

Lačečaχ	č'i.inəŋq	aʔnexʷsəzi::n.
Laččaχ	č'inəŋq	aʔnxʷsəzin.
sun.DIM	beautifully	shines

Almost every word shows a spoken:sung deviation. Especially prevalent are (i) epenthesis (as in *jasena*, ultimately from Russia *jasna*) and (ii) lengthening as in *č'i.inəŋq*). As a further notational convention, we will distinguish two types of lengthening: (ii.a.) *č'i.inəŋq*, written with a period, denotes a single vowel sung over two notes, each with a separate attack, 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, corresponding to spoken: *zora* 'twilight'–there is no phonemic vowel length distinction in Itelmen). A vowel followed by a double length symbol *(si::n)* is held over three beats.

[2] "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 abgiebet." 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)

[3] Glosses in examples use Leipzig glossing conventions (https://www.eva.mpg.de/lingua/resources/glossing-rules.php). Additional abbreviations are: ASP aspect, AUG augmentative, COLL collective, DIM diminutive, FREQ frequentative (also: non-directed motion), INTERJ interjection, PRES present, PRTC particle. Angled brackets enclose infixes. Notations such as 1>3SG indicate portmanteau agreement affixes, in this case first person acting on third person singular.

[4] In the first word, we cannot pre-theoretically 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 will 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.

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 will 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 *jasna* 'clear' to describe the weather). We will 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.

2. Zaporotsky's khodila: A proposed analysis

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 18th century (Krasheninnikov 1755), by the early 20th century only the Western variety remained, split in two dialect groups and spoken in 8 villages along the Okhotsk coast. As of 2021, fewer than five elderly speakers control the language both natively and fluidly, although there are others, including second generation and heritage speakers with varying degrees of fluency and a linguistic revitalization movement has taken shape (Degai 2016).

One phonological characteristic of Itelmen, relevant to current interests, is that it is characterized by an 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) (Volodin & Ono, et al. 2021; Bobaljik 1996a).

(4)
a.	čkpčeʔn	'spoons'
b.	tɸsčŋin	'you are carrying it'
c.	kčkłqzuknen	'he dove'
d.	mskčeʔn	'I will make them'
e.	sitłxpk'eł	'with embers'
f.	k'ənsłxč	'boil it (tea)!'

Despite the tolerance of clusters, there is evidence for epenthesis (Bobaljik 1996a). Sonorants and glides (and *z*)[5] only occur adjacent to a vowel (with the exception that nasals and liquids may occur word initially

[5] 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 Koyrak in /j/ or /r/, suggesting that Itelmen /z/ may have historically arisen from a sonorant (see Fortescue 2005:9).

before another consonant). If morphological patterns would otherwise leave a sonorant not adjacent to a vowel, epenthesis obtains. The epenthetic vowel in Itelmen is, as in other Chukotko-Kamchatkan languages, schwa. These phonological facts are relevant to our study since the regular phonological epenthesis contrasts with epenthesis in the text-setting example: anaptyxis in the khodila is not determined by phonological context, and the epenthetic vowel is almost always [e] not [ə]. As we will see below, then, 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).[6] Typical khodilas evoke the composer's feelings towards their present circumstances, love, sadness, desires, etc. (Krasheninnikov 1755, vol2:114, cited in Porotov 1967). 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 Aleksander P. Volodin and Aleksander S. Asinovskij.[7] The khodila consists of 52 lines of text grouped into two-line stanzas. Each line may be broken into two 6-beat measures, with each measure further sub-divided into two 3-beat half measures. The metrical structure of each line may be represented as in (4)—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.:

(4) 6/4 || ♩ ♩ ♩ | ♩ ♩ ♩ || ♩ ♩ ♩ | 𝅗𝅥 . ||

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

(5) Condition 1
Align words:measures
No word spans a measure boundary (qualified below).

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

[6] The etymology of the name *khódila* is obscure—there is an obvious parallel to the Russian word meaning 'walk' (past tense feminine: *khodíla*; though note differences in stress and corresponding vowel quality) but whether or not this is merely coincidental is unknown.
[7] The Khodila is included in Degai (2014), and the audio recording, with a preliminary transcription is at the time of writing available online at: https://vimeo.com/150369369.

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 3-beat half measures, of which there are 156 in total.

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

Consider the first line, repeated from above, with beats as indicated:

(6)

‖	♩	♩	♩	|	♩	♩	♩	‖	♩	♩	♩	|	𝅗𝅥.	‖
O	ses	tas		ja	se	na		ə	ze	zank		si::n.		
Ostas				jasna				əzzank				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 also 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:

(7)

‖	♩	♩	♩	|	♩	♩	♩	‖	♩	♩	♩	|	𝅗𝅥.	‖
La	če	čaχ		č’i	.i	nəŋq‿aʔ			nex^{w}	sə		zi::n.		
Lačča	χ			č'inəŋq				aʔnx^{w}səzin.						
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 *laččaχ* 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—this does not correspond to a phonetic geminate.) The adverb *č'inəŋq* 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 one. The . in our notation is meant to indicate that this is not a single vowel held across two notes, but rather that each beat has a distinct attack. The word *aʔnx^{w}səzin* is three syllables in

the spoken language, and in the song spans a full measure (6 beats). The last syllable, since it falls at line end, is held over a full 3-beat half measure (Condition 3). The remaining two syllables are mapped to a 3-beat half measure, with *e* epenthesized on the second beat. Note that *e* occurs between *n* and x^w in the 4-consonant cluster [ʔnx^{w}s].[8] In the next section, we will 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 *č'inəŋq* is syllabified as an onset to the (otherwise) vowel-initial word *aʔnx^{w}səzin.* 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 (full) measures align.[9] 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, i.e., across lines.)

The conditions just presented represent the core paraphonology of the Itelmen khodila. There are 52 lines of text. 50 of these end in a single syllable held over the last three beats (we discuss the 2 outliers below). Excluding the last half measure of each line, there are then 156 non-line-final 3-beat half-measures. Of these, 148 (95%) have either epenthesis (85 occurrences) or vowel lengthening (63 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

As the reader may verify, there are 85 instances of epenthesis and 63 instances of vowel lengthening on beats 2, 5, and 8 of any given line. The choice between epenthesis and lengthening is, in the significant majority of cases, easily predictable on phonological criteria. With few qualifications and exceptions the following holds: If the first syllable is closed, then there is epenthesis after the first consonant of the inter-syllabic 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. Examples of epenthesis are given in (8), and of vowel lengthening (with (.) or without (:) a separate attack) are illustrated in (9). In these examples, the first column is the spoken form, 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 the appendixes).

(8) Anaptyxis

a.	əzzank	əzezank	əzza-nk

[8] In the recording, what we have transcribed [x^w] is noticeably labial. There is variation in Itelmen—we find pronunciations along a continuum [*x-x^w-ɸ*].

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

b.	laččaχ	lačečaχ	lač-čaχ
c.	manx'al	manex'al	ma-n-x'al
d.	txatxank	txatexank	txa-txa-nk
e.	Qečzumsxanke	Qečezumsxaneke	Qečzumsx-anke
f.	ipłχe	ipełχe	ipłχ-e
g.	aʔnx^{w}səzin	aʔnex^{w}səzi::n	aʔnx^{w}s-əz-in

(9) Lengthening

a.	č'ineŋq	č'i.ineŋq	č'ineŋ-q
b.	xinen	xi.inen	xinen
c.	xodil	xo.odil	xodil
d.	lilek	li:lek	lil-ek
e.	nłaleqes	nła:leqes	n-łale-qes[10]
f.	kakaʔn	ka:kaʔn	ka-ka-ʔn
g.	Seʔmanoke	Se:ʔmanoke	Seʔmano-ke
h.	mtklaaziʔn	mtkla:.azi::ʔn	mtklaa-z-iʔn

The deciding factor for epenthesis versus lengthening appears to be phonological.

Examples (8a-d) show epenthesis in two syllable words, with an initial closed syllable. As previously mentioned, whether or not the cluster is at a morpheme boundary is irrelevant. Example (8e) 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, and 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 syllable 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 (8f) shows that the epenthetic *e* occurs after the first consonant of the cluster, even though [płe] is a well-formed onset, cf. *płekas* 'to turn off the road' (as is unmodified [płχ], as in *płχaʔn* 'friends'). Other examples showing epenthesis after the first consonant in clusters of more than two consonants include: *xăneqteqə::s, jaqestəl,* and *q'ileɬsezə::n*. The two syllable Russian borrowing *pamjatʲ* 'memory' is parsed as *pamejat*, indicating that [mj] is treated as a consonant cluster (as opposed, say, to treating [ja] as a diphthong).

We note that by consistently epenthesizing 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 (9) all have vowel lengthening, rather than *e* epenthesis. (We postpone until the next subsection a discussion of what determines whether or not lengthening will include a separate attack (. vs. :).) In all of these, in contrast to the examples in (8), the first syllable in the spoken form is open.

[10] Suffix *-qes* here has not been identified, but the prefix and verb root are clear.

Comparison of (8g) and (9g) illustrates the special status of glottal stop, which is not treated as a consonant in this computation. In (9g), the sequence [seʔma] is treated as having an open syllable, i.e., only a single intervocalic consonant. Likewise, in (8g) the location of epenthetic *e* conforms to the established generalization (after the first consonant) only if the glottal stop is not counted. This behaviour of glottal stop is systematic in the khodila and accords with its limited phonological distribution in the language (independent of the khodila).[11]

Example (9h) reinforces the point made discussing (8e): 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 this word are: *mtkla.a*. One might think that the initial cluster is a prime target for epenthesis, but instead, since the first syllable is open, lengthening applies, yielding a complex cluster of four consonants, followed by a long vocalic sequence. The form *txsaqzaxin* in line 31 makes the same broad point: epenthesis breaks up the two consonants between the first two syllables, leaving the much more complex initial cluster untouched: *txsa.qe.za.xi::n*.

Some discussion is in order regarding geminate consonants. A complete list of examples are given in (10). (We have not included *lačča*χ from (8b) since the two affricates, which span a morpheme boundary, are separately articulated and released, see also Volodin 1976:56.)

(10)	a.	əzzank	əzezank/əzəzank	əzza-nk	ln 1,9,27,29,31
	b.	unʲnʲaʔnʲč	u:nʲnʲaʔnʲč	unʲa-ʔnʲ-č	ln 33,35
	c.	spəlləzin	spə:ləzin	spəl-əz-in	ln 10

In the examples in (10b-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 inter-speaker variation. The root in (10c) is underlyingly /sp(ə)l-/, with a single *l* as seen in the noun *spəl* 'wind', as well as in other forms of the verb, such as infinitive *spəlkaz* '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 (10b) and (10c) as phonologically having only a single underlying intervocalic consonant, then lengthening rather than epenthesis is as predicted.

We might then leave (10a) as a result of the optionality of intervocalic gemination.[12] On the other hand, 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, i.e., lexical (in contrast to (10b-c)). A single *z* would not be expected to trigger schwa epenthesis, and could surface as **zank*,

[11] Among the few authors that 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 and 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.

[12] 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 (a). Example (10c) speaks against this (if it is accurately transcribed—see main text), since it has a lengthened schwa.

which is unattested. In sum, although there are only three word forms at issue, if the underlying forms for the words in (10) are as given in the third column (with schwa potentially epenthetic in all instances, see Bobaljik 1996a), then there is no special behaviour 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 behaviour of the verb *kelezi?n*, which is sung three times with epenthesis and repetition of the *l* as if it were geminate: *kelelezi?n*, and four (or five) times with vowel lengthening *ke.elezi?n/ke:lezi?n*, as if the *l* were not geminate. See section 3.1.2 below.

The account we have 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 (11a), there is a single intervocalic consonant (ignoring glottal stop) thus beat 2 is realized as lengthening.[13] In (11b-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.

(11)	a.	ti?n i	ti:?n i
	b.	qa?t χej	qa?te χej
	c.	qa?t lem	qa?te lem
	d.	ijanał me	i:ja | nałe me

The sole exception in this regard is given in (12). It occurs three times in the khodila, once with unexpected epenthetic *i* in place of *e* (see section 3.1).

(12)	xałč me	xałče me

An alternative to treating (12) as exceptional would be to posit that the epenthetic vowel is inserted at a word boundary, if there is one. In addition to (12), this would cover (11b-c), while (11a) 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: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[14]

The preceding discussion identifies the phonological factors that determine whether the vocalic element added to the second beat of non-final half measures under Condition 2 will be realized as epenthesis or

[13] If Condition 2a 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*.

[14] 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.

lengthening. We now turn to whether lengthening will be realized as a long vowel (V:) or as a series of two identical vowels, with '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 52 lines, each of which is divided into two six-beat measures (each of which is further divided into two 3-beat half measures). The scoring of the first four lines is presented in Figure 1:

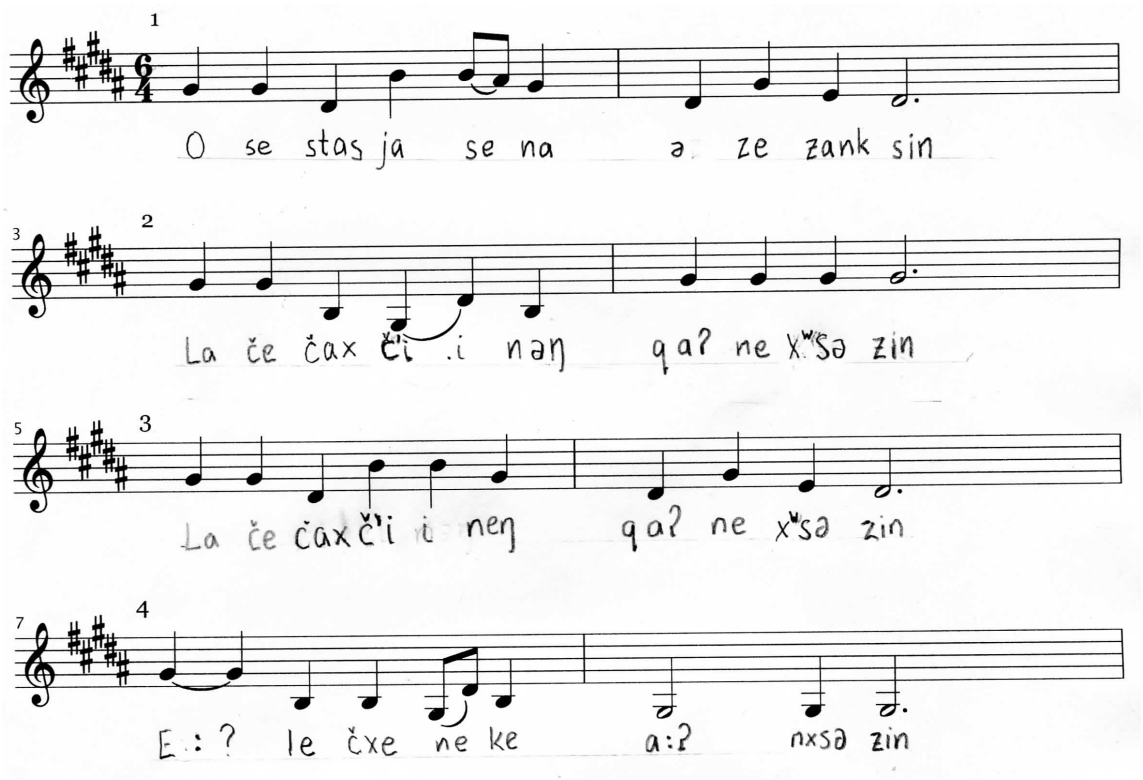


Figure 1: First four lines of khodila.

With very few exceptions, which we discuss as "intrusive stanzas" below, these four lines are representative of the entire khodila in the following ways:

(13) Khodila melodic structure:

A. The first two beats of the first half-measure of every line start with the same two notes.
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.

a. In odd-numbered lines, beats 4 and 5 are sung on the same note, and 7 and 8 show a rising progression.
b. In even-numbered lines, beats 4 and 5 show a rising progression, and 7 and 8 are sung on the same note.
c. 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 Figure 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. All but one of the few remaining exceptions are in the first or final half-measures of lines in what we have termed below the 'intrusive stanzas' (lines 19-26).[15]

Now, the generalization about lengthening is as follows:

(14)

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

The generalization in (14) accurately describes 61 of 64 instances of lengthening in the khodila, solely in terms of the musical structure. Two of the remaining instances are instances of (13Cc), where there is a note transition on the upbeat of beat 5, not falling under (14): in one case there is a second attack (line 45) and in one case there isn't (line 17). The only clear exception to (14) is in line 3, where *č'i.ineŋq* 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 of from line 2 in this occurrence.

We take it then, 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 section 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

[15] 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.

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 section 3.2.

3.1 Deviations in the core khodila

3.1.1 Syllable count mismatches

The algorithm we have identified in section 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 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 a 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 which 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 (15):

(15)

|| sto:wa | laneke	|| ku:nʔe | zi::ʔn. ||
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: *sto.wa.lank*—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 non-final position. Evidently, the solution is to epenthesize at word end: *lan.ke*. This creates a two-syllable form, with a consonant cluster, which can be parsed according to the conditions in section 2—there is an intersyllabic cluster that can be mapped to the song form via *e*-epenthesis: *la.ne.ke.* We note in passing that the epenthesis of final *-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.[16]

In only one example in the core khodila does the opposite occur: there are too many syllables in the text. Line 27 repeats the opening line of the khodila, after the thematic self-referential digression. However, rather than *osetas*, the first half-measure includes an additional discourse particle *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: *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: *Se?manoke* 'to Semanok' (or 'to Semanom') has four syllables, all open (discounting the glottal stop), and thus the first and third syllable are lengthened: *Se:?mano.oke*. 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.

3.1.2 Epenthetic C (9 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 *osetas*, i.e., from underlying *ostas* with epenthesis after the first consonant. Instead, it surfaces as *osestas*, with expected *e*-epenthesis, but unexpected doubling of the first consonant.[17] There a total of 6 types (9 tokens) of such additional consonant epenthesis in the text, an exhaustive list is given in (16):

(16)		spoken	sung	expected	
	a.	ostas	osestas	osetas	(2x)
	b.	kelezi?n	kelelezi::?n	ke(.)elezi::?n	(3x)
	c.	kelezi?n	keɣelezi::?n	ke(.)elezi::?n	
	d.	Qeqəŋajanke	Qeweqəŋajanke	Qe(.)eqəŋajanke	
	e.	sewer	sewe(r)wer	se.ewer[18]	
	f.	skoro	kororo	sko:ro	

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

[17] We cannot exclude the possibility that the underlying form is *osstas* 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 wordlists and texts.

[18] It is possible that this form is a disfluency and recovery in performance. Impressionistically, it sounds as if the singer sung *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꞉lezi꞉꞉ʔn* (lines 34, 36, 48), *ke.elezi꞉꞉ʔn* (line 49), and *[sk]o꞉ro* (line 31). (16c) 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 Volodin (1976:62) *qaɣ^{w}a[č]*, Orlova *qaɣač*, but Volodin and Khaloimova (2001:38) *k'aβač,* Bobaljik (1996b:16) *k'a.ač*. These may all represent an approximant [ɰ]. Otherwise /ɣ/ does not occur as a native phoneme. Note that the final two forms in (16) are Russian borrowings (*sewer* 'Northwind' from Russian *sever* 'North', and *skoro* 'quickly' from Russian with meaning unchanged).

Note also that four of the nine tokens in (16) 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 section 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 (16) are mildly anomalous in light of the system we proposed in section 2, the deviations are minor, and with the exception of the intrusive *w* in (16d), can be understood in one way or another as reflecting independently justifiable aspects of Itelmen phonology.

3.1.3 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 3 wordforms, an epenthetic vowel occurs in the expected position, but is not *e*. A complete list is given in (17):

(17)	a.	xał.či me	ln 7
	b.	i.piɬ.χe	ln 7,13,47
	c.	ə.zə.zank	ln 27,29

In (17b-c), the unexpected vowel takes on the quality of the immediately preceding vowel. (17a) occurs in line 7, and is immediately followed by a second instance of unexpected *i*: *xałči me ipiɬχe!* All of these forms occur elsewhere in their expected form, with *e*, e.g.: *xałče me ipeɬχe!* (line 37), *əzezank* (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 neighbouring vowels.

Extra epenthesis

In lines 39/41 and 44/45, epenthesis occurs twice in a single half-measure, once as predicted (on the second beat) and an extra, spurious epenthesis occurs on the last off-beat of the penultimate half-measure (this also happens in lines 19/21 discussed in section 3.2). We have no account of this irregularity.[19]

(18) ‖𝅗𝅥 ♩ ♫ | 𝅗𝅥. ‖

a. xă ne č'ele | qzu::n

b. xă ne xamə | ne::k

Unexpected lengthening

The word *aʔnx^{w}səzin*, discussed above, occurs at the end of 6 lines of text. Five of these are realized, in conformity with section 2, as *aʔnex^{w}səzi::n*, but one occurrence makes use of lengthening, preserving the cluster unbroken: *a:ʔnx^{w}səzi::n*. Lengthening in place of epenthesis also occurs in *e:sčaq* (line 17); the same word occurs with (expected) epenthesis instead of lengthening in the following line: *esečaq*.

In one instance in the core khodila (and two in the intrusive stanzas), in (19), a nasal consonant is lengthened where the algorithm would have yielded epenthesis after the nasal:

(19) xănławulk xăn:ławu::lk ln 46

Nothing that we know of would have prevented epenthesis here, compare line 43 where epenthesis occurs in the same phonological environment: xănłalek → xănełalek.

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.

3.2 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 1994:196-198). The khodila described here, with the exception of lines 19-26, is in essence a series of riffs

[19] The verb stem in the second example is *xamne-* (or *χaʔmne-*) in all modern attestations, although it occurs with a schwa between *m* and *n* in Tiushov’s 1906 word list.

on ‘oh what a beautiful day.’ Lines 19-26, by contrast, exhibit a reflexive mode of consciousness, a kind of self-referential meta-comment on and in the khodila:

> 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 plural 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: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 (13). 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, lines 19-26 represent 4 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 *tłəŋːqaŋ||čen* ‘I sang (it)’ has lengthening of the nasal, rather than epenthesis (cf. (19) above). Lines 23/25 mix Russian *možet (byt^{j})* ‘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 *(byt^{j})* is omitted, leaving a two syllable word, with an open first syllable, lengthened, as expected. But in line 25, the full Russian expression *možet byt^{j}* ‘maybe’ is squeezed into the first half-measure, here with a skipped first beat then a contracted second syllable. The most interesting lines, form the perspective of the paraphonological analysis we offer here, are lines 19/21. These two lines are almost entirely in Russian:

Line 19: <e> xu tiʔn na | pamejat^{j} || itel^{j}e | me.enam ||
E xu tiʔn na pamjat^{j} itel^{j}menam
INTERJ PRTC this to memory Itelmen.PL.DAT

Line 21: __ i na | pamejat^{j} || i.itel^{j}e | me.enam ||
i na pamjat^{j} itel^{j}menam
and this 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 and replacing all of the filler elements with the Russian/Itelmen conjunction particle *i* 'and', but omitting the discourse particles other than *i* 'and', and starting on the second beat after a pause.

The remainder of the line is in Russian, including lexical items and grammatical elements such as preposition *na* and the dative plural case marking on *Itelmens*. The Russian word *pamjat'* 'memory' is nicely incorporated into the khodila schema (disyllabic word as a three-beat half-measure, with epenthesis), but this leaves *itelʲmenam*, 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.lʲe] to a single beat, with [lʲe] sung on the offbeat. In both lines 19 and 21, [menam] 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 (13), these are the only instances of what we might call departures of commission.[20] 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 the 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. Discussion and conclusion

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

[20] As contrasted with 'departures of omission' in lines 21, 25, and 47, where the first beat is simply missing.

middle beats of each non-final 3-beat half-measure in a 12-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 epenthesis in 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 in which optional gemination of intervocalic consonants interacts with epenthesis and lengthening, and in the way in which glottal stop is not treated as a full consonant in determining the position of epenthesis.

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Appendix 1: Khodila text

Column 1 provides the Itelmen text with a word-by-word rough gloss.
Column 2 shows the corresponding line as sung in the kholida, with breaks between beats (|) and half-measures (||) indicated. A tie bar indicates a final consonant that is syllabified as the onset of the following syllable. Epenthetic segments are indicated in red.

1.	Ostas jasna əzzank sin autumn clear outside is	O|se|stas || ja|se|na || ə|ze|zank || sin
2.	Laččaχ č'inəŋq aʔnx^{w}səzin sun.DIM beautifully shines	La|če|čaχ || č'i|.i|nəŋq || aʔ|ne|x^{w}sə||zin
3.	Laččaχ č'inəŋq aʔnx^{w}səzin sun.DIM beautifully shines	La|če|čaχ || č'i|.i|nəŋq || aʔ|ne|x^{w}sə||zin
4.	Eʔlečχenk aʔnx^{w}səzin. cliff.DIM.LOC shines	E|:ʔ|le||čχe|ne|ke || a|:ʔ|nx^{w}sə||zin.
5.	Kakaʔn esčaq kelezиʔn, nutcrackers strongly call	Ka|:|kaʔn || e|se|čaq || ke|le|le||ziʔn,
6.	Stowalank kunʔeziʔn pine.grove.LOC eat.cones	Sto|:|wa||la|ne|ke || ku|:|nʔe||ziʔn
7.	Xałč me, ipłχe, xănłalek. hey PRTC friend.VOC let's.walk	Xał|či| me || i|pi|łχe || xă|ne|ła||lek.
8.	Qeqəŋajanke xănłalek. Qeqenaj.DAT let's.walk	Qe|we|qə||ŋa|jan|ke || xă|ne|ła||lek.
9.	Ostas jasna əzzank sin. autumn clear outside is	O|se|stas || ja|se|na || ə|ze|zank|| sin.
10.	Sewer č'ineŋq spəlləzin. north[wind] beautifully blows	Se|we(r)|wer || č'i|.i|neŋq || spə|:l|lə||zin.
11.	Kakaʔn esčaq seŋzoziʔn, nutcrackers strongly fly	Ka|:|kaʔn || e|se|čaq || se|ŋe|zo||ziʔn,
12.	Stowalank kunʔeziʔn pine.grove.LOC eat.cones	Sto|:|wa||la|ne|ke || ku|:|nʔe||ziʔn
13.	Xałč me, ipłχe, xănqteqəs. hey PRTC friend.VOC let's.gather	Xał|če| me || i|pi|łχe || xă|neq|te||qəs.
14.	Ijanał me xănqteqəs. raspberry PRTC let's.gather	I|:|ja||na|łe| me || xă|neq|te||qəs.
15.	Jaqstəl esčaq kelezиʔn,	Ja|qes|təl || e|se|čaq || ke|ɣe|le||ziʔn,

	gulls strongly cry	
16.	Tosxank χajqen mtklaaziʔn sand.LOC there eat.spent.fish	To|se|xank || χa|je|qen || mtkla|:|.a||ziʔn
17.	Jaqstəl esčaq kelaziʔn, gulls strongly cry	Ja|qes|təl || e|:s|čaq || ke|le|le||ziʔn,
18.	Tosxank esčaq mtklaaziʔn sand.LOC strongly eat.spent.fish	To|se|xank || e|se|čaq || mtkla|:|.a||ziʔn
19.	E xu tiʔn na pamjatʲ itelʲmenam eh so this to memory to.Itelmens	<e> xu | tiʔn | na || pa|me|jatʲ || i|te|le||menam
20.	Xinen xodil tłəŋqaŋčen such khodila I.sang	Xi|.i|nen || xo|.o|dil || tłəŋ|:|qaŋ||čen
21.	I na pamjatʲ itelʲmenam and to memory to.Itelmens	__ | i | na || pa|me|jatʲ || i|.i|tele || menam
22.	Xinen xodil tłəŋqaŋčen such khodila I.sang	Xi|.i|nen || xo|.o|dil || tłəŋ|:|qaŋ||čen
23.	Možet, txatxask txiłałxkməŋ, may someday you.will.remember.me	Mo|:|žet || txa|te|xask || txi|.i|łał||xkməŋ
24.	Tiʔn i xodil čaqaʔłałsx. this and khodila you.will.sing	Ti|:ʔ|n i || xo|.o|dil || ča|:|qaʔ||łałsx.
25.	Možet bytʲ, txatxask txiłałxkməŋ, may be someday you.will.remember.me	__|Mož't|bytʲ|| txa|te|xask || txi|.i|łał||xkməŋ
26.	Tiʔn i xodil čaqaʔłałsx. this and khodila you.will.sing	Ti|:ʔ|n i || xo|.o|dil || ča|:|qaʔ||łałsx.
27.	Ostas əzzank jasna sin. autumn clear outside is	A|os|tas || ə|zə|zank || ja|se|na|| sin.
28.	Mesjac č'ineŋq aʔnxʷsezin. moon beautifully shines	Me|:|sec || č'i|.i |nəŋq || aʔ|ne|xʷsə||zin
29.	Skoro əzzank txsaqzaxin. soon outside will.dawn	[s]ko|ro|ro || ə|zə|zank || txsa|qe|za||xin.
30.	Zora qaʔt χej aʔnxʷsezin. twilight already there shines	Zo|:|ra || qaʔ|te| χej || aʔ|ne|xʷsə||zin
31.	Skoro əzzank txsaqzaxin. soon outside will.dawn	[sk]o|:|ro || ə|ze|zank || txsa|qe|za||xin.
32.	Zora qaʔt χej aʔnxʷsezin. twilight already there shines	Zo|:|ra || qaʔ|te| χej || aʔ|ne|xʷsə||zin
33.	Unʲnʲaʔnʲč qaʔt lem ŋoʔneziʔn.	U|:|nʲnʲaʔnʲč || qaʔ|te| lem || ŋo|.oʔ|ne||ziʔn.

	birdies already also wake.up	
34.	Lilek č'ineŋq kelezin. willow.LOC beautifully calling	Li|:|lek || č'i|.i|neŋq || ke|:|le||zin.
35.	Unʲnʲaʔnʲč qaʔt lem ŋoʔneziʔn. birdies already also wake.up	U|:nʲ|nʲaʔnʲč || qaʔ|te| lem || ŋo|.oʔ|ne||ziʔn.
36.	Lilek č'ineŋq kelezin. willow.LOC beautifully calling	Li|:|lek || č'i|.i|neŋq || ke|:|le||zin.
37.	Xałč me, ipłχe, xănłalek. hey PRTC friend.VOC let's.walk	Xał|če| me || i|pe|łχe || xă|ne|ła||lek.
38.	Seʔmanoke xănłalek to.Semanok let's.walk	Se|:ʔ|ma||no|.o|ke || xă|ne|ła||lek.
39.	Nuʔn me tχasčaχ xănč'elqzun, that PRTC path let's.cross	Nu|:ʔn| me || tχa|se|čaχ || xă|ne|č'ele||qzun,
40.	Manx'al it'e nłaleqes. from.where once we.walked	Ma|ne|x'al || i|.i|t'e || nła|:|le||qes.
41.	Nuʔn me tχasčaχ xănč'elqzun, that PRTC path let's.cross	Nu|:ʔn| me || tχa|se|čaχ || xă|ne|č'ele||qzun,
42.	Manx'al it'e nłaleqes. from.where once we.walked	Ma|ne|x'al || i|.i|t'e || nła|:|le||qes.
43.	Malanʲačx'al xănłalek, across.Malanjachq let's.walk	Ma|:|la||nʲa|če|x'al || xă|ne|ła||lek,
44.	Seʔmanoke xănxamnek, to.Semanok let's.pass	Se|:ʔ|ma||no|.o|ke || xă|ne|xamə||nek,
45.	Seʔmanoke xănxamnek, to.Semanok let's.pass	__ | Seʔ|ma||no|.o|ke || xă|ne|xamə||nek,
46.	Uwalačχank xănławulk. on.pass let's.sit	U|:|wa||la|če|χank || xăn|:|ła||wulk.
47.	Qečiq, ipłχe, q'ilɸsezən. well, friend.VOC, listen!	Qe|če|qe || i|pi|łχe || q'i|leɸ|se||zən.
48.	Č'inəŋq jaqstəl kelaziʔn, beautifully gulls call	Č'i|:|nəŋq || ja|qe|stəl || ke|:|le||zin,
49.	Č'inəŋq jaqstəl kelaziʔn, beautifully gulls call	Č'i|:|nəŋq || ja|qe|stəl || ke|.e|le||zin,
50.	Qečzumsxanke seŋzoziʔn. to.Qečzumsx they.fly	Qe|če|zum||sxa|ne|ke || se|ŋe|zo||ziʔn.
51.	Č'inəŋq jaqstəl kelaziʔn,	Č'i|:|nəŋq || ja|qe|stəl || ke|le|le||zin,

	beautifully gulls call	
52.	Qečzumsxanke seŋzoziʔn. to.Qečzumsx they.fly	Qe|če|zum||sxa|ne|ke || se|ŋe|zo||ziʔn.

Appendix 2: Morphological parse of Khodila text, with free translation.[1]

1. Ostas jasna əzz-ank s-in
   autumn clear outside-LOC BE.PRES-3SG
   'The autumn outdoors is clear.'
2. Lač-čaχ č'inəŋ-q aʔnx^{w}s-əz-in
   sun-DIM beautiful-ADV shine-PRES-3SG
   'The sun is shining beautifully.'
3. Lač-čaχ č'inəŋ-q aʔnx^{w}s-əz-in
   sun-DIM beautiful-ADV shine-PRES-3SG
   'The sun is shining beautifully.'
4. Eʔle-čχ-enk aʔnx^{w}s-əz-in.
   cliff-DIM-LOC shine-PRES-3SG
   'It shines on the little cliff.'
5. Kaka-ʔn esča-q kele-z-i<ʔ>n,
   nutcracker-PL strong-ADV call-PRES-3<PL>
   'Nutcrackers are calling loudly.'
6. Stow-al-ank kunʔe-z-i<ʔ>n
   pine-COLL-LOC cone-PRES-3<PL>
   'They are eating pinecones in the pine grove.'
7. Xałč me, ipłχ-e, xăn-łale-k.
   INTERJ PRTC friend-VOC 1PL.IMP[2]-walk-1
   'Hey friend! Let's walk!'
8. Qeqəŋaj-anke xăn-łale-k.
   Qeqenaj-DAT 1PL.IMP-walk-1
   'Let's walk to Qeqenaj!'
9. Ostas jasna əzz-ank s-in
   autumn clear outside-LOC BE.PRES-3SG
   'The autumn outdoors is clear.'
10. Sewer č'ineŋ-q spəl-əz-in.
    north.wind beautiful-ADV blow-PRES-3SG

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[1] 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 isn't expected here.

[2] The prefixes that 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.

‘A north wind is blowing nicely.’

11. Kaka-ʔn esča-q seŋ-zo-z-i<ʔ>n,
    nutcracker-PL strong-ADV fly-FREQ-PRES-3<PL>
    ‘Nutcrackers are flying around.’
12. Stow-al-ank kunʔe-z-i<ʔ>n
    pine-COLL-LOC cone-PRES-3<PL>
    ‘They are eating pinecones in the pine grove.’
13. Xałč me, ipɬχ-e, xăn-qte-qəs.
    INTERJ PRTC friend-VOC 1PL.IMP-gather-INF
    ‘Hey friend, let’s go gathering.’
14. Ijana-ɬ me xăn-qte-qəs.
    raspberry-INSTR PRTC 1PL.IMP-gather-INF
    ‘Let’s gather raspberries.’
15. Jaq-stəl esča-q kele-z-i<ʔ>n,
    gull-COLL strong-ADV call-PRES-3<PL>
    ‘The gulls are calling loudly.’
16. Tosx-ank χajqen mtklaa-z-i<ʔ>n
    sand-LOC there spent.fish-PRES-3<PL>
    ‘On the sand there they are eating the spent fish.’
17. Jaq-stəl esča-q kele-z-i<ʔ>n,
    gull-COLL strong-ADV call-PRES-3<PL>
    ‘The gulls are calling loudly.’
18. Tosx-ank esča-q mtklaa-z-i<ʔ>n
    sand-LOC strong-ADV spent.fish-PRES-3<PL>
    ‘On the sand they are eating spent fish very much.’
19. E xu tiʔn na pamjatʲ itelʲmen-am
    eh so this to memory Itelmen-DAT.PL$_{RUSSIAN}$
    ‘So it is to the memory of the Itelmens,’
20. Xinen xodil t-łəŋqaŋ-čen
    such khodila 1SG-sing-1>3SG
    ‘I have sung this khodila.’
21. I na pamjatʲ itelʲmen-am
    and to memory Itelmen-DAT.PL$_{RUSSIAN}$
    ‘And to the memory of the Itelmens,’
22. Xinen xodil t-łəŋqaŋ-čen
    such khodila 1SG-sing-1>3SG

‘I have sung this khodila.’

23. Možet, txatxask txiɬ-aɬ-xkməŋ,
    may someday remember-FUT-1SG.OBJ
    ‘Maybe someday you will remember me,’
24. Tiʔn i xodil čaqaʔɬ-aɬ-sx.
    this and khodila sing-FUT-2PL
    ‘and you will sing this khodila.’
25. Možet byt^{j} txatxask txiɬ-aɬ-xkməŋ,
    may someday remember-FUT-1SG.OBJ
    ‘Maybe someday you will remember me,’
26. Tiʔn i xodil čaqaʔɬ-aɬ-sx.
    this and khodila sing-FUT-2PL
    ‘and you will sing this khodila.’
27. Ostas jasna əzz-ank s-in
    autumn clear outside-LOC BE.PRES-3SG
    ‘The autumn outdoors is clear.’
28. Mesjac č'ineŋ-q aʔnx^{w}se-z-in.
    moon beautiful-ADV shine-PRES-3SG
    ‘The moon is shining beautifully.’
29. Skoro əzz-ank txsa-qza-x-in.
    soon outside-LOC dawn-DUR-FUT-3SG
    ‘Soon it will be light out.’
30. Zora qaʔt χej aʔnx^{w}se-z-in.
    twilight already there shine-PRES-3SG
    ‘The twilight is already glowing.’
31. Skoro əzz-ank txsa-qza-x-in.
    soon outside-LOC dawn-DUR-FUT-3SG
    ‘Soon it will be light out.’
32. Zora qaʔt χej aʔnx^{w}se-z-in.
    twilight already there shine-PRES-3SG
    ‘The twilight is already glowing.’
33. Un^{j}n^{j}a-ʔn^{j}-č qaʔt lem ŋoʔne-z-i<ʔ>n.
    bird-PL-DIM already also awake-PRES-3<PL>
    ‘The little birdies are also already waking up.’
34. Lile-k č'ineŋ-q kele-z-in.
    willow-LOC beautiful-ADV call-PRES-3SG

‘In the willows (there) is beautiful calling.’

35. Unʲnʲa-ʔnʲ-č qaʔt lem ŋoʔne-z-i<ʔ>n.
    bird-PL-DIM already also awake-PRES-3<PL>
    ‘The little birdies are also already waking up.’
36. Lile-k č'ineŋ-q kele-z-in.
    willow-LOC beautiful-ADV call-PRES-3SG
    ‘In the willows (there) is beautiful calling.’
37. Xałč me, ipɬχ-e, xăn-ɬale-k.
    INTERJ PRTC friend-VOC 1PL.IMP-walk-1
    ‘Hey friend, let’s walk!’
38. Seʔmano-ke xăn-ɬale-k
    Semanok-DAT 1PL.IMP-walk-1
    ‘Let’s walk to Semanok (Semanom)!’
39. Nuʔn me tχas-čaχ xăn-č'el-qzu-n,
    that PRTC road-DIM 1PL.IMP-cross-DUR-1PL>3SG
    ‘Let’s take that path,’
40. Man-x'al it'e n-ɬale-qes.
    where-ABL once 1PL-walk-INF
    ‘Along which we once walked.’
41. Nuʔn me tχas-čaχ xăn-č'el-qzu-n,
    that PRTC road-DIM 1PL.IMP-cross-DUR-1PL>3SG
    ‘Let’s take that path,’
42. Man-x'al it'e n-ɬale-qes.
    where-ABL once 1PL-walk-INF
    ‘Along which we once walked.’
43. Malanʲač-x'al xăn-ɬale-k,
    Malanjachq-ABL 1PL.IMP-walk-1
    ‘Let’s walk across Malanjachq.’
44. Seʔmano-ke xăn-xamne-k,
    Semanok-DAT 1PL.IMP-cross.pass-1
    ‘Let’s cross to Semanok (Semanom)!’
45. Seʔmano-ke xăn-xamne-k,
    Semanok-DAT 1PL.IMP-cross.pass-1
    ‘Let’s cross to Semanok (Semanom)!’
46. Uwal-ačχ-ank xăn-ɬawul-k.
    pass-DIM-LOC 1PL.IMP-sit-1

‘Let’s sit on the pass.’

47. Qečiq, ipɬχ-e, q'-ilɸse-z-ən.
    well, friend-VOC, IMP-listen-PRES-2SG
    ‘Listen well, friend!’
48. Č'inəŋ-q jaq-stəl kele-z-i<ʔ>n,
    beautiful-ADV gull-COLL call-PRES-3<PL>
    ‘Gulls are calling beautifully.’
49. Č'inəŋ-q jaq-stəl kele-z-i<ʔ>n,
    beautiful-ADV gull-COLL call-PRES-3<PL>
    ‘Gulls are calling beautifully.’
50. Qečzumsx-anke seŋzo-z-i<ʔ>n.
    Qečzumsx-DAT fly-PRES-3<PL>
    ‘They are flying to Qečzumsx.’
51. Č'inəŋ-q jaq-stəl kele-z-i<ʔ>n,
    beautiful-ADV gull-COLL call-PRES-3<PL>
    ‘Gulls are calling beautifully.’
52. Qečzumsx-anke seŋzo-z-i<ʔ>n.
    Qečzumsx-DAT fly-PRES-3<PL>
    ‘They are flying to Qečzumsx.’

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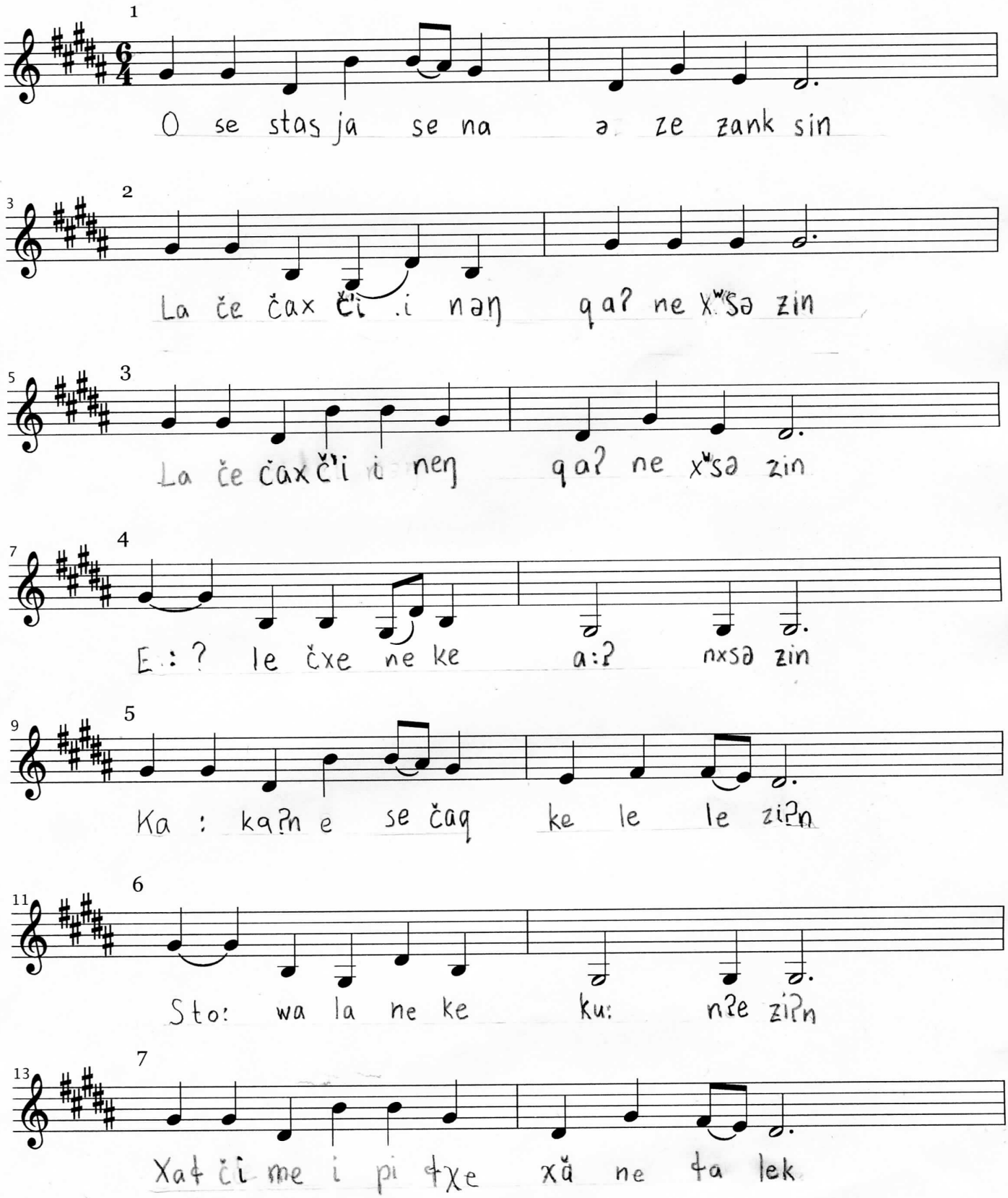

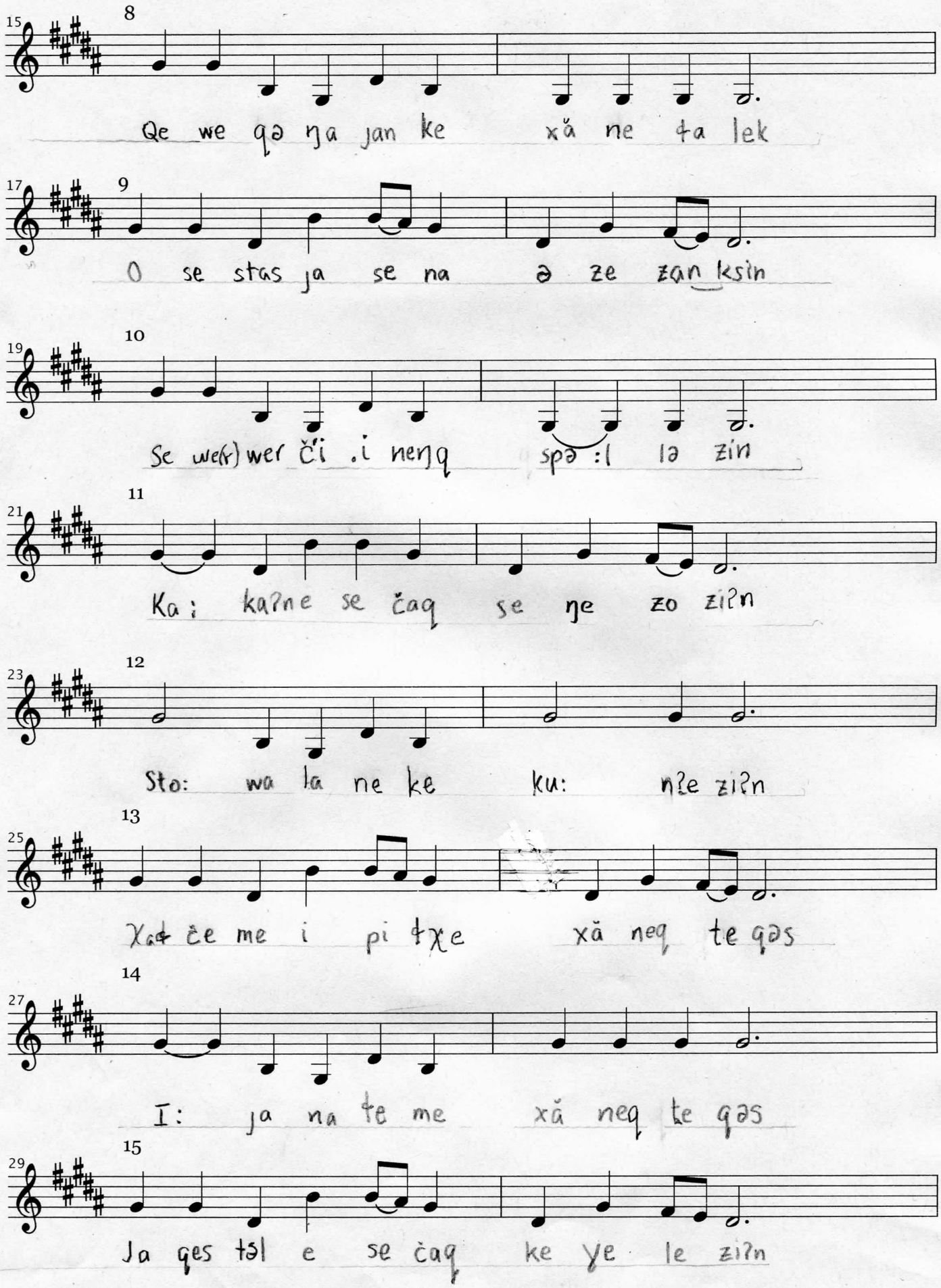
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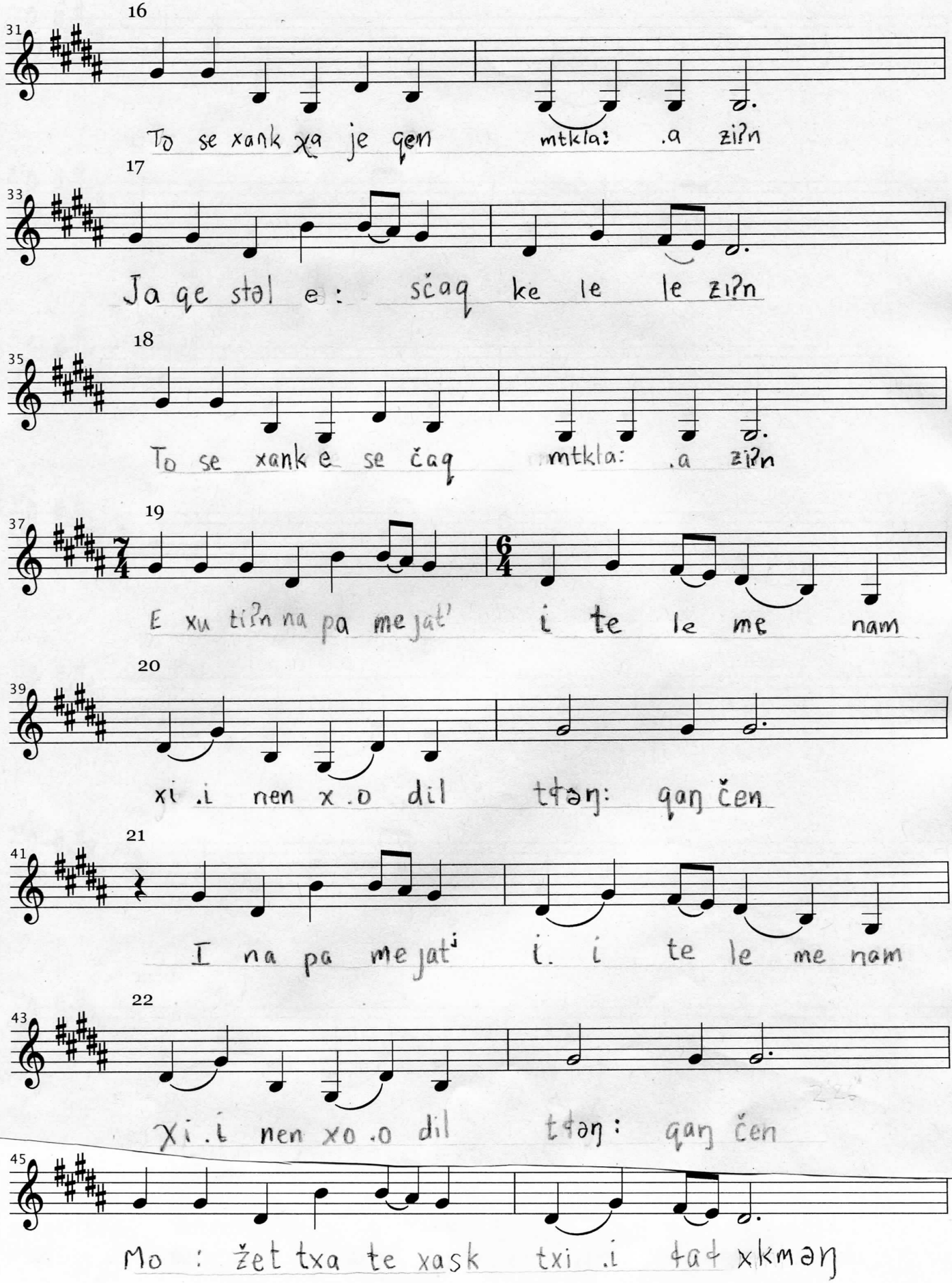
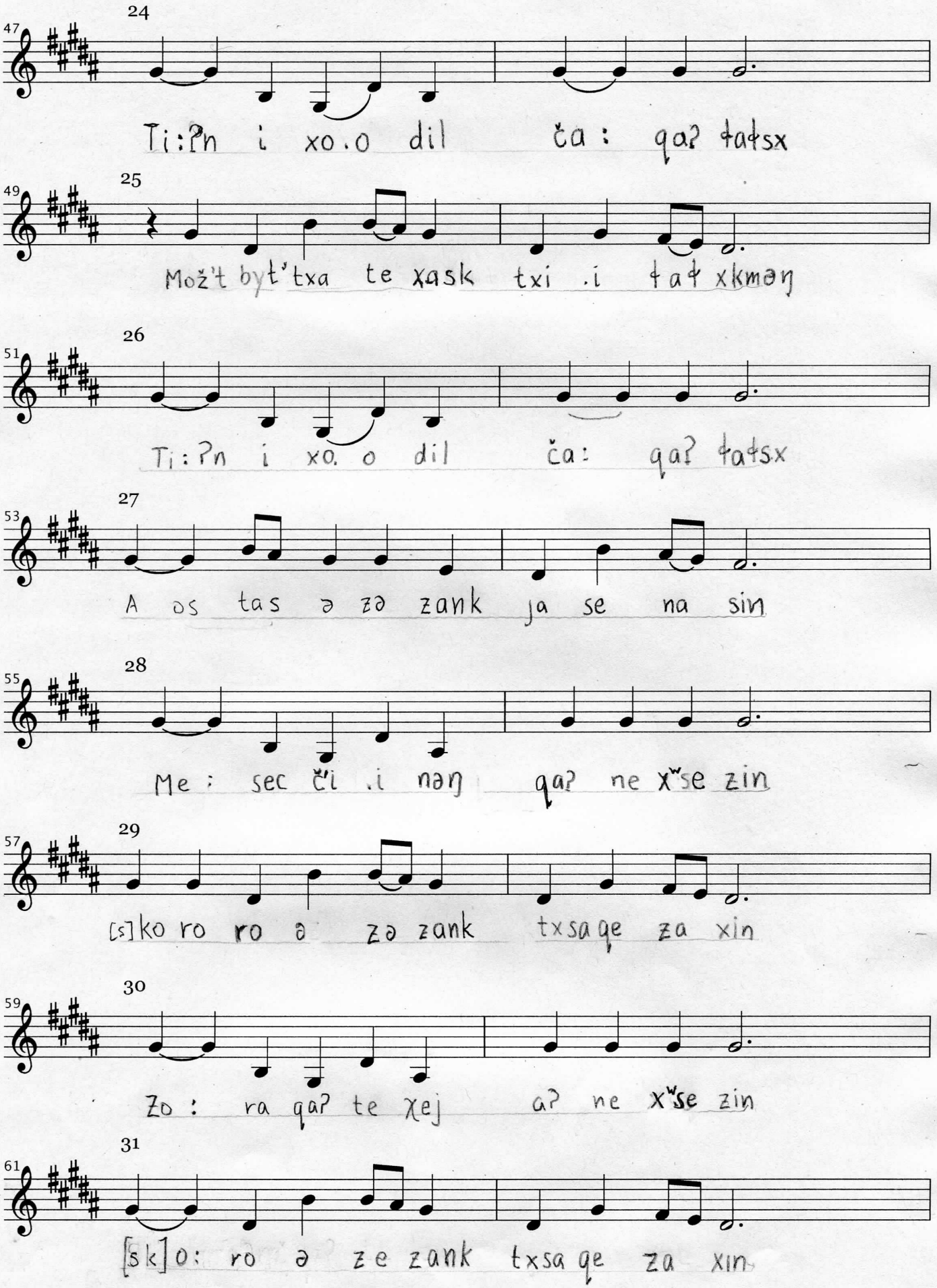
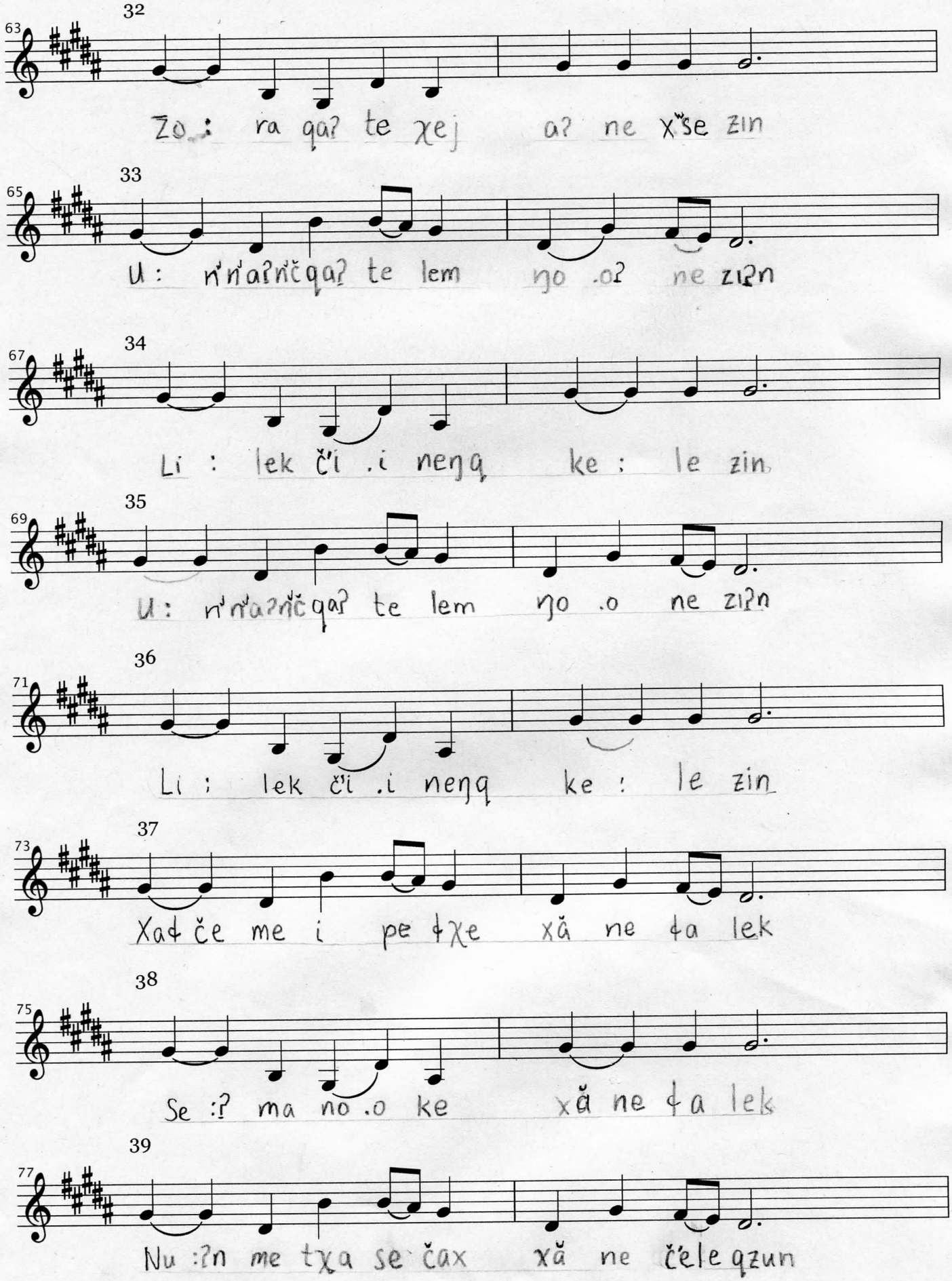
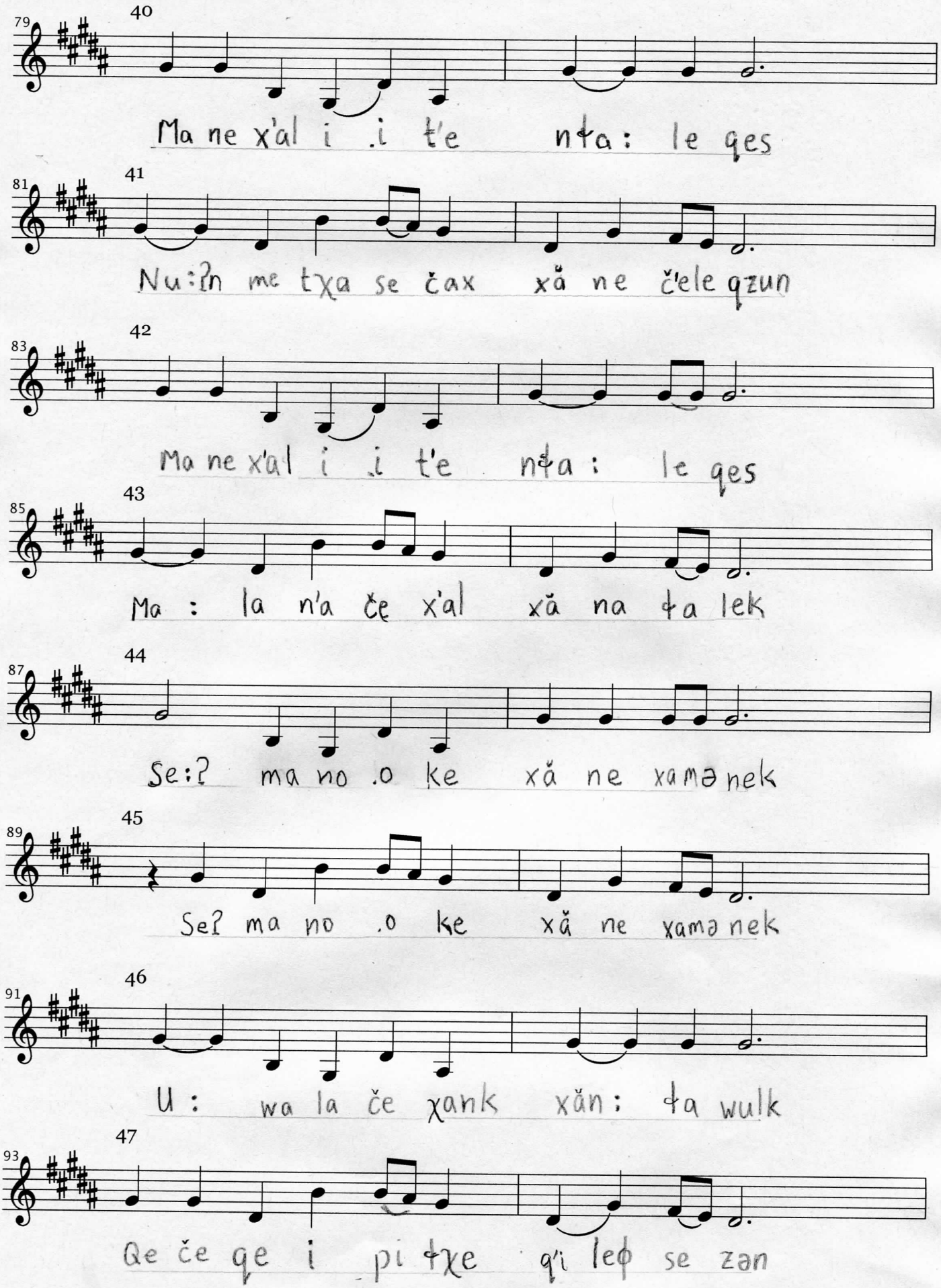
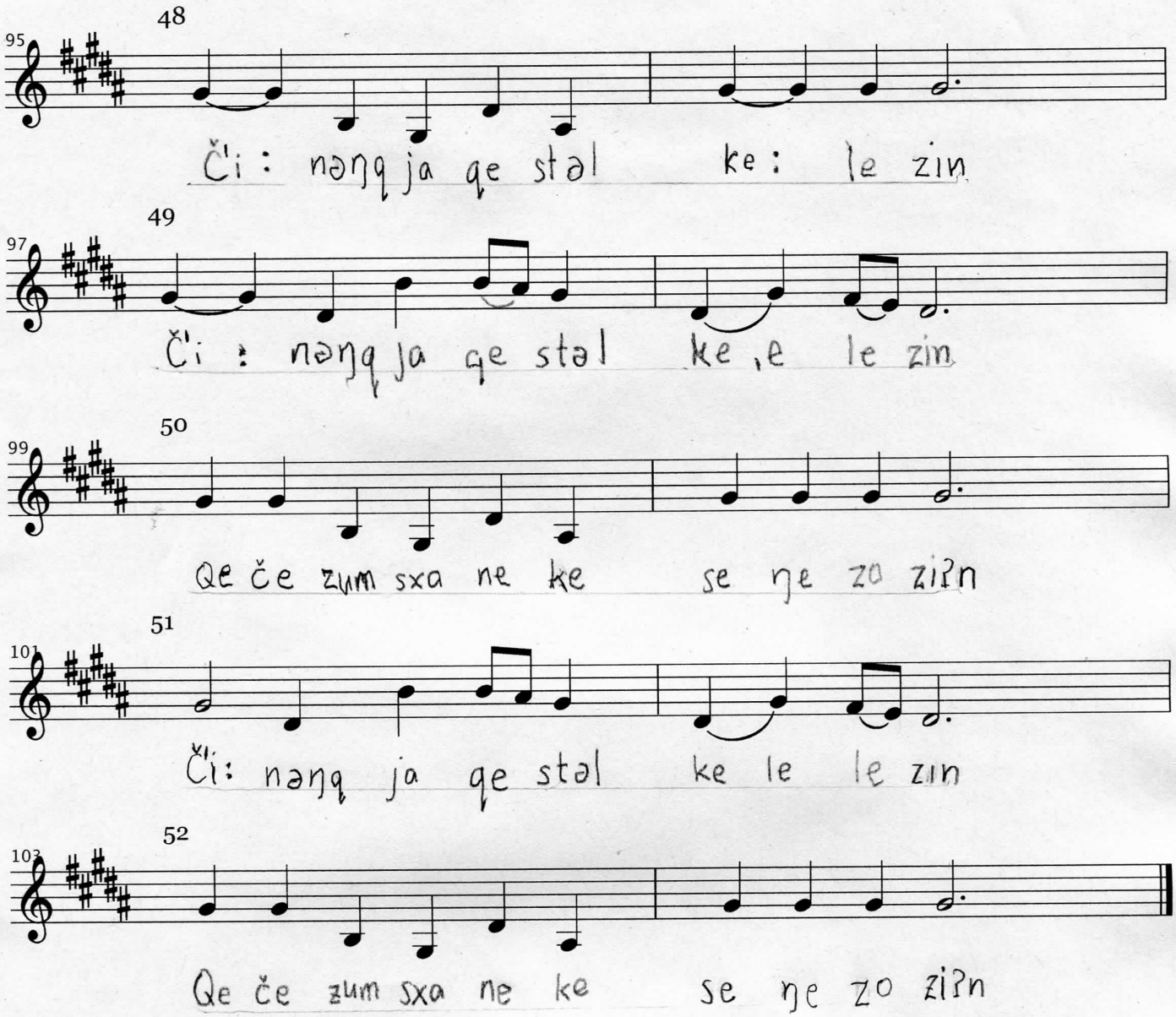
Qe we qə ŋa jan ke xă ne ɬa lek
9
O se stas ja se na ə ze zan ksin
10
Se wer) wer či .i nerŋq spə :l lə zin
11
Ka; kaʔne se čaq se ŋe zo ziʔn
12
Sto: wa la ne ke ku: nʔe ziʔn
13
Xaɬ če me i pi ɬxe xă neq te qəs
14
I: ja na ɬe me xă neq te qəs
15
Ja qes təl e se čaq ke ye le ziʔn


16
31
To se xank xa je qen mtkla: .a zi?n
17
33
Ja qe stol e: sčaq ke le le zi?n
18
35
To se xank e se čaq mtkla: .a zi?n
19
37
E xu ti?n na pa mejat' i te le me nam
20
39
xi .i nen x .o dil tɬəŋ: qaŋ čen
21
41
I na pa mejat' i. i te le me nam
22
43
χi .i nen xo .o dil tɬəŋ: qaŋ čen
45
Mo : žet txa te xask txi .i tat xkməŋ


24
47
Ti:ʔn i xo.o dil ča: qaʔ ɬaɬsx
25
49
Možʼt byɬʼtxa te xask txi .i ɬaɬ xkməŋ
26
51
Ti:ʔn i xo. o dil ča: qaʔ ɬaɬsx
27
53
A os tas ə zə zank ja se na sin
28
55
Me: sec čʼi .i nəŋ qaʔ ne xʷse zin
29
57
[s]ko ro ro ə zə zank txsa qe za xin
30
59
Zo: ra qaʔ te χej aʔ ne xʷse zin
31
61
[sk]o: ro ə ze zank txsa qe za xin


32
63
Zo.: ra qa? te χej a? ne x̌se zin
33
65
U: n̓n̓a?n̓čqa? te lem ŋo .o? ne zi?n
34
67
Li : lek čʼi .i neŋq ke : le zin
35
69
U: n̓n̓a?n̓čqa? te lem ŋo .o ne zi?n
36
71
Li : lek čʼi .i neŋq ke : le zin
37
73
Xaɬ če me i pe ɬχe xă ne ɬa lek
38
75
Se :? ma no .o ke xă ne ɬa lek
39
77
Nu :?n me tχa se čax xă ne čʼele qzun


79
40
Ma ne x'al i .i t'e nɬa: le qes
81
41
Nu:ʔn me tχa se čax xă ne č'ele qzun
83
42
Ma ne x'al i .i t'e nɬa: le qes
85
43
Ma: la n'a če x'al xă na ɬa lek
87
44
Se:ʔ ma no .o ke xă ne xamənek
89
45
Seʔ ma no .o ke xă ne xamənek
91
46
U: wa la če χank xăn: ɬa wulk
93
47
Qe če qe i pi ɬχe q'i leɸ se zən


48
95
Či: nəŋǫ ja ǫe stəl ke: le zin
49
97
Či: nəŋǫ ja ǫe stəl ke, e le zin
50
99
Qe če zum sxa ne ke se ŋe zo ziʔn
51
101
Či: nəŋǫ ja ǫe stəl ke le le zin
52
103
Qe če zum sxa ne ke se ŋe zo ziʔn