Chechen stress and vowel deletion
An optimality theory approach
Erwin R. Komen

Abstract
In the Northeast Caucasian language Chechen the deletion of short vowels is connected with the stress pattern of the language. Data elicited from native speakers indicates that Chechen uses trochees, usually aligns them on the left, and the main stress is on the leftmost foot. This analysis, conducted within the framework of Optimality Theory, links the deletion of short vowels to a tendency to reduce the total number of syllables in a word. The resulting more complex onsets or codas have to adhere to sonority rules. Deletion of short vowels is restricted to those that would otherwise not have been accented, and that are not part of the root of a word.

1.   Introduction

Chechen has a rich system of vowels, diphthongs and triphthongs (Nichols 1997, Komen 2007). The kind of "default" vowel is phonemically the short /a/. This sound is sometimes realized as a [ɜ] (this is the IPA character for an a-like sound that is very close to the schwa) and at other times as a schwa [ə]. But in some cases the sound seems to have been completely deleted. In this paper I use an optimality theoretic approach to determine the conditions under which the short /a/ is deleted in Chechen.

Since the deletion of short vowels may be completely or partly motivated by stress, the main part of this paper will be devoted to determining how the stress system for Chechen works. Where and why vowels are deleted will be discussed as part of treating the stress system. Some aspects of the Chechen stress system were discussed briefly by Nichols (1997:966-968), and where applicable I will refer to her work. In particular, Nichols notes that vowel deletion optionally occurs for final unstressed short vowels

In this research two sets of data are used to investigate the Chechen stress pattern and the vowel deletion process. The first set of data is from a male speaker, approximately 50 years old, born and raised in the village Chiri-Yurt, which is part of the Shali region of Chechnya. This is data I have elicited personally. The second set of data is from a female speaker, whose age and dialect are unknown to me (Akhmadova 2005). The data I took from her comes from the internet, where she reads a children's story in Chechen. I treat these two data sets separately.

In this paper vowel deletion is investigated almost exclusively for realizations of words that occur in isolation, i.e. where the prosodic word coincides with the lexical word.

Note that the division into syllables given throughout this paper is my own proposal. My division is based on the following harmony rules:

1) CV, CVV > CVC, CVCC, CCVC, CCVCC

2) CVVC > CV.VC

Further note that, since the deletion of short vowels occurs quite often in Chechen, it is sometimes not completely clear whether underlying forms of a word actually contain a short vowel or not. So for several cases there is uncertainty as to the input form. For some speakers vowel deletion is more dependent on speed than for others. The male speaker shows remarkably little vowel deletion in normal speech, whereas the female speaker shows more vowel deletion, even in slow speed.

This paper is organized as follows. Section 2 starts with a discussion of how stress is realized and recognized in Chechen. Section 3 provides an overview of the Chechen stress system. Then in section 4 a detailed analysis is given for the stress system used by the male speaker. This is followed by the analysis of the female speaker's system in section 5. Section 6 summarizes the findings and discusses questions for further analysis.

2.   *Tone and stress*

In this section I examine how stress is realized in Chechen, and how it can be recognized. In languages in general stress could be realized by any combination of the following three components: tone, length, and volume.

In Chechen *length* of vowels and of consonants is phonemic. However, this is not to say that length does not play a role in the realisation of prominence. Length does play a role in the following ways:

a. The meaning of many words in Chechen can be "intensified" by lengthening the last root consonant. For instance /tʃʼooʁa/ 'strongly' can turn into /tʃʼooʁʁa/ 'very strongly'.

b. Word-final vowels are lengthened when particular words are following. Sometimes this is intensification, e.g. /duqa/ 'much' followed by /a/ becomes [duqqaa-ʔa]. Sometimes the meaning changes radically, e.g. /tsʼqʼa/ 'once' followed by /a/ becomes [tsʼqʼaa-ʔa] 'never'.

I have not fully investigated the degree to which *volume* plays a role in stress. However, *tone* definitely plays an important role.

It is good to note the following tendencies concerning the prosodic word and the sentence in Chechen:

- One of the first syllables of the word starts with a high tone.

- The average tone of the word decreases gradually over a phonological phrase.

- Superposed on the average tone there is a kind of high-low melody, possibly coinciding with the syllables.

- Sometimes there seem to be low-high melodies instead of high-low ones.

- The prosodic word can end in two ways:

    o It can either end on a low tone, which is probably the lowest of the whole utterance. This seems to be the unmarked ending.

      o Or it can end on a low tone followed by a higher tone.

As to stress assignment, I have adopted the following rule for this paper:

    3) The main stress of the word is on the syllable that has the highest tone.

A complication in the discernment of stress is the downstep (or downdrift[1]) that is taking place in the pronunciation of Chechen phrases. The question is at what boundaries exactly downstep occurs. Nichols argues that in some cases downstep occurs on the level of the syllable, the foot or on the level of a syntactic phrase (1997:967). I discuss this question in sections 3 and 4.2.

3. The overall picture

The Chechen stress system can be illustrated by considering the following words. For each word the underlying form is given, then the surface form, and finally the proposed foot structure.

a.	/dika/	[díkə̄]	(dí.kə)	'good'
b.	/taruo/	[tɝ́rùə]	(tɝ́.ɾuə)	'possibility'
c.	/tʃaaʁar/	[tʃáːʁɜ̀r]	(tʃáa.ʁɜr)	'wine'
d.	/daagalie/	[ˈdáːgə̄ˌl̃iə]	(dáa.gə).liə	'before burning'
e.	/ledara/	[lɛ́dɝ́rə̄]	(lɛ́.dɜ).rə	'sloppy'
f.	/jisinarʃ/	[ˈĵîsíˌnɝ̀rʃ]	(jí.si).(nɜ̀rʃ)	'remainder-PL'
g.	/tʼetesira/	[tʼétɛ̄sìrɜ̀]	(tʼɛ́.tɛ).(sì.rə)	'fling.onto-RFPS'
h.	/jaqʼajala/	[jɝ́qʼə̄jɜ̄lɜ̀]	(jɝ́.qʼə).(jɜ̀.lə)	'dry.up-INF'
i.	/samaveelira/	[sɑ̃́mɝ́wɛ̄ːl̃irɜ̀]	(sɝ́.mə).(wèe.li).rə	'wake.up-RFPS'

The following tendencies can be noted purely from the phonetic forms of the words:

- Words start with a high tone and the tone gradually decreases over the syllables. Every syllable has a tone that is either the same or lower than the tone of the preceding syllable (this points to downstep or downdrift).
- The difference between weak and heavy syllables does not seem to play a role.

If the division into feet is correct, the following tendencies can be noted:
- Words are divided into feet from left to right.
- The first syllable of the foot has the main stress, so feet are trochaic.
- The main stress of the word is on the leftmost foot.
- When a syllable does not fit into the foot structure no strategy is pursued to make it fit.

A frequency plot of the word /jaqʼajala/ may illustrate the foot division. It is shown in Figure 1, where the frequency is given in semitones. Note that the frequency of the last syllable of the first foot is almost the same (maybe even slightly lower) than the frequency of the first syllable of the second foot. This is an indication that the foot division and the assumption of downstep at foot boundaries is correct[2].

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[1] The difference between downstep and downdrift is disputable. Downdrift is more automatic lowering of the tone, possibly also connected with intonation. Downstep is a phonologically triggered lowering of tones. E.g. a high tone is lowered considerably when it is preceded by a low or mid tone.

[2] One attractive alternative foot structure approach is not able to account for this data. In such an approach Chechen words only have one foot, which is completely to the left of the word. The first syllable automatically gets the main stress. All other syllables gradually have a lower tone due to downdrift. However, such an
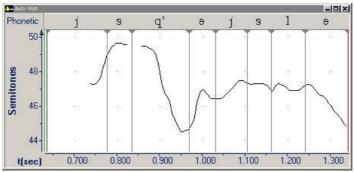
Figure 1 Frequency plot of /jaq'ajala/

Within Optimality Theory these tendencies can be translated into constraints, and these constraints can be ranked with respect to one another. The constraints that seem to play a role are the following:

   a.   LEFTMOST. The main stress should be in the first foot of the word. This is true for all words above, so this constraint is undominated.
   b.   RHTYPE=T. This constraint stipulates every foot to be of the trochee type, where the first syllable carries the stress. For the words given above this is undominated.
   c.   PARSESYL. According to this constraint every syllable should be parsed into the foot structure. This is not always happening – in words with three or five syllables the last syllable is not incorporated into a foot.
   d.   ALL-FT-LEFT. This constraints is completely satisfied when a word only has one foot, and this foot is on the left side of the word. In the case of Chechen it is dominated by PARSESYL, which means that it is better to have syllables parsed into a foot structure than to have only one foot per word.
   e.   WSP. According to the this constraint heavy syllables should receive stress. This constraint is dominated at least by the constraint RHTYPE=T as can be seen from the division of (tə́.ruə).

I suggest a tentative ranking of these constraints based on the data given above as follows:

   4)   LEFTMOST ; RHTYPE=T >> MAX-V-IO >> PARSESYL >> ALL-FT-LEFT ; WSP

As illustration for this ranking a tableau for the word /samaveelira/ (which is item i above) is given in Table 1.

Table 1 Normal parsing of five-syllable word

Input: /samaveelira/	RhType=T	LeftMost	Max-V-IO	ParseSyl	All-Ft-Left	WSP
a. ☞ (sá.ma).(vèe.li).ra				*	**	
b. (sá.ma).(vèe.lir)			*!		**	*
c. (sám).(vèe.li).ra			*!	*	*	
d. (sám).(vèe.lir)			*!*		*	*
e. sa.(má.vee).(lì.ra)		*!		*		*
f. (sa.má).(vee.lìr)	*!			*	**	*

The tentative ranking from (4) needs to be substantiated with more evidence, which is one of the goals of the next sections where the stress facts for a male and a female speaker of Chechen are investigated more carefully.

approach would not be able to explain why two consecutive syllables in a word have the same pitch or why a following syllable could even have a slightly higher pitch than the preceding one.

The other goal of the following sections will be to look at exceptions to the general pattern laid out here. These exceptions will be described in terms of constraints.

4. Stress for the male speaker

I will now review the male speaker's speech strictly from the point of view of stress assignment. In section 4.1 I will start with bisyllabic words. In section 4.2 I address trisyllabic words, as well as the first examples of vowel deletion. Then in section 4.3 four-syllable words are treated and the issue of lexical tone is discussed. Some five-syllable words are treated in section 4.4, where further cases of vowel deletion arise. Lexical tone is given separate treatment in section 4.5.

4.1. Stress in bisyllabic words

Irrespective of the heaviness of the syllables, bisyllabic words in Chechen normally divide into trochees, as shown in Table 2. Note that the words from this table were elicited completely in isolation[3] - they were not part of a larger phrase.

Table 2 Normal stress in bisyllabic words for male speaker

Ref	Underlying	Surface	Footed	CV-pattern	Gloss
1	/diel.lalts/	[dⁱɛ́lːɜlts]	(dⁱɛ́l.lɜlts)	CVC.CVC	kill-UNTIL
2	/bee.daʃ/	[béːdɜʃ]	(bée.dɜʃ)	CVV.CVC	duck-PL
3	/tʃaa.ʁar/	[tʃáːʁɜr]	(tʃáa.ʁɜr)	CVV.CVC	wine
4	/tʃie.tar/	[tʃĩət̀ɜɾ]	(tʃĩə.tɜɾ)	CVV.CVC	tent
5	/suon.ta/	[sˤántə]	(sˤán.tə)	CVC.CV	stupid
6	/ʔɛr.na/	[ʔɛ́rnɜ̀]	(ʔɛ́r.nɜ)	CVC.CV	futile
7	/baa.la/	[báːlə]	(báa.lə)	CVV.CV	suffering
8	/dey.za/	[dǿʸzɜ]	(dǿʸ.zɜ)	CVV.CV	know-INF
9	/di.ka/	[díkɜ̄]	(dí.kə)	CV.CV	good
10	/bu.xa/	[búχɜ̄]	(bú.χɜ)	CV.CV	below
11	/ta.ruo/	[tɜ́rùə]	(tɜ́.ruə)	CV.CVV	possibility

This data shows that, even when the second syllable is heavy, as in /ta.ruo/, the first syllable still has the main stress, which is realized as a higher tone. So it is better to have a trochee than to adhere to the "stress-to-weight" principle. In OT terms that points to a ranking between two constraints. The first constraint, RHTYPE=T, tells that a word is divided into trochaic feet, i.e. feet where the first syllable has the main stress. The second constraint, WSP, indicates that a heavy syllable should attract stress. Due to the observations above the ranking is as follows:

5) RHTYPE=T >> WSP

However, when the native speaker reads a list of words, stress often falls on the second syllable, as shown in Table 3. Possibly this is in order to adhere to an intonation pattern occurring before a comma. Another reason could be that certain suffixes have lexical stress,

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[3] Many of the words presented here are taken from a vocabulary tape. For each vocabulary item there first is the word in isolation, then a sentence with that word, and finally once more the word in isolation.

and that faithfulness to stress weighs more than adherence to the trochaic pattern. I will come back to these possibility later.

Table 3 Stress in bisyllabic words read in a list

Ref	Underlying	Surface	Footed	CV-pattern	Gloss
1	/bee.daʃ/	[beːdáʃ#]	(bee.dáʃ)	CVV.CVC	duck-PL
2	/die.laʃ/	[diəláʃ]	(diə.láʃ)	CVV.CVC	kill-IMV-PL
3	/gi.na/	[ḡináɜ]	(gi.náɜ)	CV.CV	see-NRPS

Note that reading a list of words in itself might be considered to be a separate style, which has its own grammar (i.e. its own ordering of constraints). However, words where the final syllable has a relatively higher tone, are encountered in other contexts too – not only in list readings.
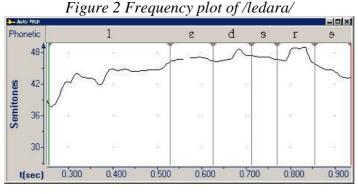
The following observations can be made from the stress patterns for bisyllabic words:
- Bisyllabic words in Chechen can normally be divided into one trochaic foot.
- The normal stress pattern can be overridden.
- The cause of overriding stress is not completely known yet – it could be due to using a different style, which entails a different ranking of constraints.

4.2.   Stress in trisyllabic words

Several examples of isolated trisyllabic words were elicited from the male native speaker. Words with three equally heavy or light syllables were hard to find. There was only one word in the database with a CV.CV.CV pattern.

6)   /le.da.ra/   [lédɜ́rə̄]   'casual'

It is hard to decide how to divide this word into a foot structure, since the first two syllables have an equally high tone, and don't distinguish themselves in volume or length (so their prominence is equal). A graph of the frequence (in semitones) against the time is shown in Figure 2.

Figure 2 Frequency plot of /ledara/

One option is (lέ.dɜ).rə, which produces a trochee on the left edge, leaving the last syllable unfooted. This option would mean that the constraint ALL-FT-LEFT ranks high. The other option is lɛ.(dɜ́.rə), which leaves the first syllable unfooted, and divides the last syllable into a trochee. That option would indicate that ALL-FT-RIGHT is ranked high, which seems quite unlikely when compared with the overall picture sketched in section 3. This last option for the foot-division however is attractive from the point of view of downstep. When there is an overall pattern of decreasing tone, then two adjacent syllables having the same tone might indicate that there is downstep occurring between them.

Which of these two options to choose then, will depend on how the pattern for other words in Chechen comes out best.

Whenever the first two syllables are light and the third syllable is heavy, as shown in Table 4, the foot structure of the words is ambiguous:

a. A light syllable followed by a trochee: L (**L** H) with downstep after the first syllable – before the next foot.
b. A bisyllabic trochee followed by a monosyllabic one: (**L** L) (H) with downstep between the two feet.

In either case the main stress is on the leftmost foot. Note in particular [ˈʔə́dɹ̄mùə], which has a High-Mid-Low tone pattern. I have no explanation why there is no difference in prominence between the first two syllables for most of the words here. But based on [ˈʔə́dɹ̄mùə] I argue that the foot structure of all the words should be as (**L** L) (H).

Table 4 Trisyllabic words of L-L-H type

Ref	Underlying	Surface	Footed	Gloss
1	/zu.da.beer/	[zúdə́bìːɾ]	(zú.də).(bìɪɾ)	young woman
2	/ji.si.narʃ/	[ˈjísíˌnɜ̀rʃ]	(jí.si).(nɜ̀rʃ)	remainder-PL
3	/ʔa.da.man/	[ˈʔə́dɹ́ˌmɹ̄n]	(ʔɹ́.dɹ).(mɜn)	human-GEN
4	/ji.si.narʃ/	[jísɪ̄ˈnɹ́rʃ]	(jì.si).(nɹ́rʃ)	remainder-PL
5	/ʔa.da.muo/	[ˈʔɹ́dɹ̄mùə]	(ʔɹ́.dɹ).(muə)	human-ERG

Note that the word for 'remainder-PL' was elicited twice. The first occurrence, elicited in isolation, has the main stress on the first trochee. The second occurrence has the main stress on the second trochee (the word-final syllable), but was not elicited in isolation. It was elicited as part of the clause [jisinarʃ xaza jara] 'the remaining ones were good'. Within that clause the word /jisinarʃ/ stood out as a phonological phrase preceded and followed by a pause. However, the word [xaza] that follows it is focused (see Komen 2007). Besides the fact that Chechen uses a special focus position before the verb, a focused constituent stands out prosodically by (a) starting with a high tone itself and (b) having the preceding word end with a high tone. So this second occurrence of /jisinarʃ/ is influenced by a constraint from phrasal phonology dictating its last syllable to have a high tone[4]. In order to limit the scope of this paper I will not expound further on this matter, but instead I introduce a general constraint INTONATION, that is an abbreviation of constraints associated with comma intonation, focus intonation and possibly other types. The exact nature of these constraints will be left for future research.

The first occurrence of /jisinarʃ/ was an isolated utterance, whereas the second one was influenced by intonation. This shows that adherence to the intonation pattern is valued higher than assigning the main stress on the first trochee starting from the left. So in OT terms:

7) INTONATION >> LEFTMOST

When only the *second* syllable is heavy, two patterns surface. The first pattern resembles the one seen for the LLH words above. The tones on the three syllables of the word are high-mid-

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[4] To describe the tonal requirements an alignment constraint could be used such as: Align(FocP,Left;High-Tone, Left and Right). So the left side of a FocusPhrase is marked by a high tone in the preceding and the following syllable.

low. Given the tendency above to start making trochee feet at the left edge, I argue that the footing of these words should be as (**L** H) (L). See examples 1-3 in Table 5.

Table 5 Trisyllabic words of L-H-L type

Ref	Underlying	Surface	Footed	Gloss
1	/t'ɛ.tyex.na/	[t'ɛ́tʸɜχnə̀]	(t'ɛ́.tʸɜχ).nə̀	bump-NRPS
2	/t'ɛ.gul.dan/	[t'ɛ́gūldə̃̀]	(t'ɛ́.gul).də̃	draw.near-INF
3	/tʃu.vuos.sa/	[tʃúwɑ̄sːə̀]	(tʃú.wɑs).sə	descend-INF
4	/t'ɛ.ʔiets.na/	[t'ɛ́jⁱɛ̄tsnə̀]	(t'ɛ́.jⁱɛts).nə	accept-NRPS
5	/tsˤa.ter.ra/	[tsɡ̄tɛ́rːə̀]	tsɡ.(tɛ́r.rə)	alike
6	/sˤa.daaq.qa/	[sˤá'dáχqə̀]	sˤɑ.(dáχ.qə)	bring.here-INF

The second pattern observed in these LHL words is one where the second syllable, the heavy one, has the highest tone. I argue that the footing of these words is L (**H** L). So for these trisyllabic words the first foot is *not* left aligned to the edge of the word, which is a violation of the constraint ALL-FT-LEFT. All the trisyllabic words in Table 5 have a preverb (or a kind of prefix as in the case of /tsˤa.ter.ra/, which can be divided up into /tsˤa/ 'one' and /terra/ 'alike').

A solution to this problem may be in the morphological structure of these words. Some preverbs could be regarded as a morphological word itself. If the prosodic word equals a morphological word, i.e. PRWD=MRPWD, then both the preverb and the verb should have left aligned trochaic foot stress. The combination of the preverb and the verb (or other root) form a prosodic phrase. Where the main stress of a prosodic phrase lies is a question beyond the scope of this paper. But if the assumption above is correct, then "resetting" of the downstep may occur at word boundaries, which would explain what is happening with a "compound" word like sˤɑ.(dáχ.qə). In support of this analysis, Nichols argues for preverbs to have their own stress, and that their stress is the primary stress of the compound word (1997:966).

When only the *first* syllable of a trisyllabic word is heavy, so that an H-L-L pattern is formed, the most logical pattern is (**H** L) L – a left aligned trochaic foot followed by an unparsed light syllable.

Table 6 Trisyllabic words of H-L-L type

Ref	Underlying	Surface	Footed	Gloss
1	/til.li.na/	[tílīnɜ̀]	(tíl.li).nɜ	dress-NRPS
2	/tal.xa.do/	[tálχɜ̄dɔ̀]	(tál.χɜ).dɔ	spoil-D-CAU-PRS
3	/ʔaa.la.pa/	[ʔáːlɜ̄pə̀]	(ʔáa.lɜ).pə	salary
4	/k'ie.ga.ra/	[k'ɪ̄əgɜ́rɜ̄]	(k'ɪ̄ə.gɜ).rɜ)	backwards

The remainder of the syllable patterns, which have either two or three heavy syllables, behave not very differently from the ones shown so far. The usual pattern is for the trisyllabic word to divide into a trochee consisting of two syllables (which may apparently be any of LH, HL, HH), and then to finish with a trochee consisting of one heavy syllable. Examples are shown in Table 7.

Table 7 Trisyllabic words with two or more heavy syllables

Ref	Underlying	Surface	Footed	Gloss
1	/t'ɛ.gul.di.ra/	[t'ɛ́gūldĩr]	(t'ɛ́.gul).(dìr)	draw.near-RFPS
2	/ʃai.t'a.naʃ/	[ʃáit'ɜ̃nɜ̀ʃ]	(ʃái.t'ɜ).(nɜʃ)	demon-PL
3	/dyħ.dy.ħal/	[dˤœ́ħdˤœħɑl]	(dˤœ́ħ.dˤœ).(ħɑl)	opposite
4	/huor.da.xuoi/	[hᵘɔ́rdəχᵘɔi]	(hᵘɔ́r.də).(χᵘɔi)	seamen
5	/tul.ʁie.naʃ/	[túlʁīənɜ̀ʃ]	(túl.ʁiə).(nɜ̀ʃ)	wave-PL
6	/see.qa.ʕad/	[séːqɜ̄ʕɑ̄d]	(sée.qə).(ʕɑ̀d)	bow
7	/dˤaa.qaal.la/	[dˤɑ̱ˈqálːɜ̄]	dˤɑ̱.(qál.lə)	eat.up-INF
8	/dˤaa.jiel.la/	[dˤɑ̱ji̯ɛ́lːɜ̄]	dˤɑ̱.(ji̯ɛ́l.lə)	open-NRPS
9	/dˤaa.xuu.da/	[dˤɑ̱χúːdɜ̄]	dˤɑ̱.(χúu.də)	suck.up-INF

The first example in Table 7 shows a tendency to reduce the number of syllables by deleting the word-final short /a/ vowel. In OT terms this could be expressed as a ranking where a gradient constraint all-syllables-left dominates a faithfulness constraint MAX-V-IO:

   8) ALL-σ-LEFT >> MAX-V-IO

The gradient constraint requiring all syllables to align left is a shorthand for the following alignment constraint:

   9) ALL-σ-LEFT
       ALIGN(σ,L;PrWd,L)

In the data displayed in Table 7, the only words not having a trochee starting at the left edge of the word are examples 7-9. All these words start with a preverb /dˤaa/. Their behavior is similar to the words in Table 5 starting with preverbs /sħa/ and /tsħa/. So here again the preverbs could be regarded as separate morphological words, and should receive their own stress.

    To summarize my analysis of trisyllabic words, I argue that the prevalent footing structure is a left-aligned bisyllabic trochee followed by the third syllable of the word. If this third syllable is heavy, it can also be regarded as a trochee, but then monosyllabic. If the third syllable is light, then it cannot be parsed into a foot structure and becomes extrametrical, incurring a violation of ParseSyl.

    The analysis in this section shows that the weight-to-stress constraint WSP is ranked very low. The fact that a syllable is heavy or light does not seem to influence stress assignment in Chechen.

    To illustrate what was found so far Table 8 displays the tableau of /t'eguldira/.

Table 8 Tableau of a trisyllabic word

Input: /t'e.gul.di.ra/	All-σ-Left	Son-Seq	RhType=T	LeftMost	Max-V-IO	ParseSyl	All-Ft-Left	WSP
a. (t'ɛ́.gul).(dì.ra)	***!						**	*
b. ☞ (t'ɛ́.gul).(dìr)	**				*		**	*
c. t'ɛ.(gúl.dir)	**				*	*!	*	*
d. (t'ɛ́).(gùl.dir)	**		*!		*		*	*
e. (t'ɛ̀).(gúl.dir)	**		*	*!	*		*	*
f. (t'gúl.dir)	*	*!			**			*
g. (t'ɛ́.guldr)	*	*!			**			*

For the moment the three constraints ALL-σ-LEFT, RHTYPE=T and LEFTMOST seem to be undominated. If there is any ranking between them, it is as yet undetermined[5]. The constraint PARSESYL should dominate ALL-FT-LEFT, because otherwise a form like t'ɛ.(gúl.dir) would be the wrong winner. So if possible it is better to parse a syllable into a foot structure, which has as an obvious consequence that there will be more feet. The ranking between the constraints Max-V-IO, ALL-FT-LEFT and WSP needs to be determined from other configurations.

   An additional constraint has been used to exclude otherwise more optimal variants like (t'gúl.dir) or (t'ɛ́.guldr). The constraint prohibiting these variants must determine which combinations of consonants are allowed in the onset and in the coda. For the moment I have used the constraint SON-SEQ, which is defined as follows:

   10) **SON-SEQ**
       Complex onsets rise in sonority, and complex codas fall in sonority.

For this particular example, the constraint SON-SEQ is sufficient to prevent unwanted reductions of the word /t'eguldira/. However, it would seem that there are other factors preventing certain vowels from being deleted. It can for instance be observed that no root vowel is ever deleted. This means that a constraint like MAX-ROOT-V-IO is undominated for Chechen.

Yet even this constraint is not able to account for the fact that the vowel /i/ cannot be deleted in the word /t'eguldira/. This word morphologically consists of three roots. The first root /t'e/ is a preverb meaning 'onto' (it also occurs separately in the language as a postposition). The second root /gul/ does not occur on its own in Chechen, but it has the basic meaning of 'gather'. The third root is /d(a)/ from the verb 'do, make'. This is one of the verbs used to convert adjectives and nouns into transitive verbs. The remainder of the word consists of a past tense suffix /-ira/. Note that the vowel /i/ does not properly belong to any of the three roots, so MAX-ROOT-V-IO could not have prevented its deletion[6].

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[5] I think that it is in principle impossible to determine a ranking between the constraints RHTYPE=T and LEFTMOST. Both of these constraints are alignment constraints. But LEFTMOST aligns feet – it is defined as ALIGN(Hd-Ft,L;PrWd,L), whereas RHTYPE=T aligns syllables – it is defined as ALIGN(Hd-σ,L;Ft,L). A misalignment of feet will not influence a misalignment of syllables (within feet) and vice-versa.

[6] The status of the vowel /i/ is arguable. It depends on the definition of the root /d(a)/. If this root is seen as consisting solely of a consonant, then /i/ is definitely not part of the root. Alternatively the root of the verb can

4.3.   Stress in words with four syllables

With very few exceptions four syllable words adhere to the $(\acute{X}\ Y)\ (\grave{P}\ Q)$ pattern, as shown in Table 9.

Table 9 Four syllable words

Ref	Underlying	Surface	Footed	Gloss
1	/tʼe.te.si.ra/	[tʼétē̄sìrə̀]	(tʼé.tɛ).(sì.rə)	fling.on-RFPS
2	/ja.qʼa.ja.la/	[jə́qʼə̄jə̄lə̀]	(jə́.qʼə).(jə̀.lə)	dry.up-INF
3	/ʔa.da.ma.ʃa/	[ˈʔə́də̄ˌmə̄ʃə̀]	(ʔə́də).(mə̀.ʃə)	human-PL-ERG
4	/ħa.la.ʔieq.qa/	[ˈħə́lə́ʔʲə̄χqə̀]	(ħə́.lə).(ʔʲə̀χ.qə)	jump.up-INF
5	/tʼɛ.gul.di.na/	[tʼə́gūldìnə̀]	(tʼə́.gul).(dì.nə)	draw.near-NRPS
6	/tʼe.tyeχ.tʃʕaa.nii/	[ˈtʼə́tʲʼœ́χˌtʃə̄ːnǐː]	(tʼə́.tʲœχ).(tʃə̀a.nii)	add.onto-WHEN
7	/dʕaa.xyy.di.ra/	[dʕə̱χýːɗìrə̀]	dʕə̱.(xýy.di).rə	suck.up-RFPS
8	/jal.sa.ma.nieħ/	[jálsə̄mānʲg̱̀ħ]	(jál.sə).(mà.nʲg̱ħ)	paradise-LOC
10	/dist.xi.lii.tan/	[dístχīlǐːtə̌̃]	(dist.χi).(lìi.tə̃)	speak.up-CAUS-INF
11	/tʃɛq.veeq.qi.na/	[tʃɛ̄qwǽqīnə̀]	tʃɛq.(wǽq.qi).nɜ	finish-NRPS
12	/sin.gat.ta.mie/	[ˈsíngɜ̄tːˌɜ̄mǐə]	(sín.gɜt).(tɜ̀.miə)	sadly
13	/juq.qʼiə.xu.lə/	[júqʼǐəxùlə̀]	(júq.qʼiə).(xù.lə)	midst-THR
14	/qʼou.sa.va.lar/	[qʼoúsɜ̄wālə̀r]	(qʼoú.sɜ).(wàlər)	quarrel-INC-NML
15	/laa.ra.ma.záa/	[láːrəmɜzàː]	(láa.rə).mɜ.záa	unintentionally
16	/tʼee.ma.veel.la/	[ˈtʼéːmɜ̄ˌwǽlːə̌̀]	(ˈtʼée.mɜ).(wæ̀l.lɜ)	wing.out-NRPS

The exceptions can be explained as follows. Words number 7 and 11 from Table 9 start with preverbs /dʕaa/ and /tʃɛq/. As I have argued for the trisyllabic words, it seems that several preverbs do not receive the main stress, or that these preverbs should be regarded as outside the scope of the prosodic word. Finally example 15, the word /laa.ra.ma.za/, has stress on the final syllable, and a long /aa/ word-final. The word does not occur in a list reading, so there is no question of comma or list intonation. Besides, the word also occurs in the form [láːrə̄mə̀z], though then it is part of a sentence. I argue that the form with the stress on the final /aa/ actually consists of the basic form /laaramaza/ plus a morpheme /a/ which has a lexical high tone and which causes the word-final /a/ to lengthen. This morpheme occurs in other places too, and signals focus or intensification. Nichols too assigns inherent high pitch to the focus marker /ʔa/ (1997:967).

Just as INTONATION was ranked high in rule (7), so faithfulness to a lexical tone should outrank any other constraints, so that I argue:

11) TONE >> RHTYPE=T

The definition of the constraint Tone is as follows:

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be seen as /d+V/, in which case the vowel /i/ is shared between the root and the suffix. In that case the constraint MAX-ROOT-V-IO could have done the job here.

12) **TONE**
    A syllable with lexical tone in the input should have the main stress in the output.

Besides preserving the tone, there should also be a faithfulness constraint that makes sure a tone-bearing vowel (or better: a vowel that should get the stress within a foot) never gets deleted – otherwise that would be a very good strategy to vacuously meet the requirements of TONE. So I argue for the following constraint to be undominated in Chechen:

13) **MAX-T-IO**
    A vowel that bears lexical tone in the input, should be realized in the output.

A tableau for the word /laaramaza/ with the focus morpheme /a/ would be as shown in Table 10.

Table 10 A four-syllable word with lexical tone

Input: /laaramaza/ + /á/	Max-T-IO	All-σ-Left	Tone	RhType=T	LeftMost	Max-V-IO	ParseSyl	All-Ft-Left	WSP
a. (láa.ra).(mà.zaa)		***	*!					**	*
b. ☞ (láa.ra).ma.záa		***					**		
c. (láa.ra).(ma.záa)		***		*!			**		
d. (laa.rà).(ma.záa)		***		*!*	*			**	*
e. (laa.rá).(ma.zàa)		***		*!*				**	*
f. (láar).ma.záa	*!	**				*	**		

4.4. Stress in words with five syllables

Words with five syllables show a mixed behavior, as can be seen from the examples in Table 11.

Table 11 Words with five syllables

Ref	Underlying	Surface	Footed	Gloss
1	/xa.za.xi.lii.tan/	[χázə́χīlī:tə̀]	(χá.zə).(χì.lii).tə̃	make.nice-INF
2	/sa.ma.vee.li.ra/	[sǽmə́wē:l̀irə̀]	(sá.mə).(wèe.li).rə	wake.up-RFPS
3	/ʔuo.ħa.byy.ʒi.ra/	[ʔʷə́ħábȳ:ʒìrə̀]	(ʔʷá.ħɡ).(byỳ.ʒi).rɜ	fall.down-RFPS
4	/tʼe.ma.luo.tʃyn.gaħ/	[tʼέmə́lūətʃ̃ìŋgḡħ]	(tʼέ.mə).(lùə.tʃ̃ìŋ).(ɡɡħ)	warrior-LOC
5	/kʼel.ħa.rá.daaq.qa/	[kʼέlħɡ̀rə́ˈdāq:ə̀]	(kʼèl.ħɡ).rə́.(dàq.qə)	save-INF
6	/ber.ta.baa.la.ban/	[bέrtəbā:ləbã̄]	(bέr.tə).(bàa.lə).bã	appeace-INF
7	/ħa.la.ʔiq.qi.ra/	[ħɡ́lʔīχqìr]	(ħɡ́l).(ʔīχ).(qìr)	jump.up-RFPS
8	/sa.ma.vee.li.ra/	[sámwē:lìr]	(sám).(wèe.lir)	wake.up-RFPS
9	/kʼie.gar.xi.ʔi.na/	[kʼìəgɜ̄rχìʔinə]	(kʼìə.gɜr).(χì.ʔi).nə	sit.down-NRPS
10	/ʔirx.quos.sa.vel.la/	[ʔìχ̧qʷās:ə̀wèl]	(ʔìχ).(qʷàs.sə).(wɛl)	jump.up-NRPS
11	/ʔirx.quos.sa.vel.la/	[ʔírχqʷāswɛl:ɜ́]	(ʔìrχ).(qʷàs.wɛl).lɜ́	jump.up-NRPS

On the one hand words like (sá.mə).(wèe.li).rə and (ʔʷá.ħɡ).(byỳ.ʒi).rɜ show a tendency for the trochaic pattern that was observed in general for four-syllable words. The constraint LEFTMOST is adhered to, and also ALL-FT-LEFT. The foot structure of the input form

/xazaxiliita/ is a bit ambiguous. Looking at the tones it could be either (χá.zə).χi.(lìi.tə̃) or (χá.zə).(χì.lii).tə̃. Since in the first case the constraint ALL-FT-LEFT would be unduly violated, I argue for the more normal division as (χá.zə).(χì.lii).tə̃.

A question to answer for these five-syllable words is why there is a lack of deletion. Why are word-final vowels not deleted, yielding nicely structured forms like (sá.mə).(wèe.lir) and (χá.zə).(χì.liit)? I think the answer is in the style of speech that is being used. There is one speech style (e.g. in the situation where the speaker tries to pronounce words well for a foreigner to hear him) where the constraint to reduce the amount of syllables is situated lower. In that case vowels can not be deleted. Then there is another speech style where the syllable reduction constraint is situated very high. In that speech style vowels are deleted to reduce the amount of syllables. Under the assumption that the constraint ALL-σ-LEFT is not active (or is situated very low) for the words mentioned here, a tableau for /xazaxiliita/ is given in Table 12.

Table 12 Tableau for a five-syllable word

Input:	/xazaxiliita/	RhType=T	LeftMost	Max-V-IO	ParseSyl	All-Ft-Left	WSP
a.	xa.(zá.xi).(lìi.ta)				*	*,**!*	
b. ☞	(xá.za).(xì.lii).ta				*	**	*
c.	(xá.za).xi.(lìi.ta)				*	***!	
d.	(xá.za).(xi.lìit)	*!		*		**	
e.	(xá.za).xi.líit			*!	**		
f.	(xáz.xi).(lìit)			*!*		**	

Note that this exercise allows the ranking of the three lowest constraints to be determined better. All-Ft-Left should dominate WSP, because otherwise (xá.za).xi.(lìi.ta) would wrongly be considered more harmonic than (xá.za).(xì.lii).ta. Furthermore PARSESYL should dominate ALL-FT-LEFT, otherwise a form like (xá.za).xi.líit would wrongly win. Only the order between PARSESYL and MAX-V-IO is still to be determined. But at least the following holds:

14) PARSESYL ; MAX-V-IO >> ALL-FT-LEFT >> WSP

Providing an explanation for a word like (k'èl.ħɡ).rɔ́.(dàq.qə) is difficult. The expected stress pattern would have been something like (σ́.σ).(σ̀.σ).σ, i.e. two feet, where the first and third syllable are prominent. The frequency plot of the word, given in Figure 3, shows that the third and fourth syllable are equally high. The high-low contrast of the fourth and fifth syllable suggests that these last two syllables of the word form a foot. But this analysis leaves the third syllable unfooted, while it is somewhere in the middle of the word and even has a special prominence.
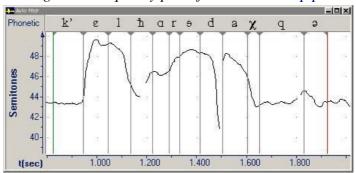
Figure 3 Frequency plot of /k'el.ħa.rá.daaq.qa/

Perhaps the preverb has a particular emphasis here? But then why would it fall on the middle syllable, leaving it unfooted? Or should the foot structure be changed into (k'èl.ħg).(rə́.daq).qə? But such a division would violate LEFTMOST. Possibly this verb should be divided into preverb /k'elħara/ and main verb /daaqqa/, each functioning as separate prosodic words and being able to receive their own main stress. In that case the higher tone on the last syllable in /k'elħara/ must be due to focus on the main verb /daaqqa/ (see section 4.2 for the explanation of the word /jisinarʃ/ which, like /k'elħara/, precedes a focused word).

The word /sa.ma.vee.li.ra/ was elicited in isolation twice[7]. The first time it was fully pronounced (see number 2 in Table 11, and also the tableau in Table 1). This resulted in two trochees assigned from the left side of the word and one unfooted final syllable. In the second realization of the word (see number 8) two vowels are deleted, resulting in a three syllable word. This word contains two trochaic feet.

The constraint MAX-ROOT-V-IO is able to prevent some vowel deletion as in (g). But the vowel /i/ from the suffix is not a root vowel. Its deletion is prevented by the SON-SEQ constraint. A tableau for the word /sa.ma.vee.li.ra/ is given in Table 13.

Table 13 Reduced five syllable word

Input:	/samaveelira/	Max-Root-V-IO	All-σ-Left	Son-Seq	RhType=T	LeftMost	Max-V-IO	ParseSyl	All-Ft-Left	WSP
a.	(sá.ma).(vèe.li).ra		***!*					*	**	
b.	(sá.ma).(vèe.lir)		***!				*		**	*
c.	(sám).(vèe.li).ra		***!				*	*	*	
d. ☞	(sám).(vèe.lir)		**				**		*	*
e.	sa.(má.vee).(lì.ra)		**!*			*		*		*
f.	(sa.má).(vee.lìr)		**		*!			*	**	*
g.	(smvée).(lìr)	*!	*	*!	*			*	**	*
h.	(sám).(vèelr)		*	*!	*			*	**	*

The five syllable input /ħa.la.ʔiq.qi.ra/ too is reduced by deletion of two vowels. The last vowel of the preverb /ħala/ is deleted, and the last vowel of the suffix /-ira/ is deleted.

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[7] One was elicited in isolation before an utterance containing it, and the second was elicited in isolation after the utterance containing it.

The word /ʔirx.quos.sa.vel.la/ consists of the preverb /ʔirx/ followed by the stem. When this word is pronounced in isolation, it is reduced to (ʔíχ).(qʷàs.sə).(wɛl). So the word-final /a/ is deleted. When the word occurs within a sentence, and something else is following, the intonation pattern requires the last vowel to carry a high tone. In that case the last vowel is not deleted, but the word is reduced by deleting the second syllable of the root, resulting in (ʔíɾχ).(qʷàs.wɛl).lə́. This form is only possible due to the constraint INTONATION, which is undominated in Chechen.

In the next section I will focus more on the effect of lexical tone by looking at paradigms that were read out by a native speaker.

4.5.   Lexical tone

So far I have shown that Chechen adheres to a trochaic stress pattern with main stress on the leftmost foot. I have also shown that this stress pattern can in some cases be overridden by an intonation pattern. In this section I will show that there is a third factor to be taken into account: tone as it is connected with certain suffixes.

The intonation pattern that has occurred so far shows up when lists of words (i.e. a paradigm of the conjugation of a verb) are read out by the male native speaker. It would then be expected that most of the words (except the last one) end on a high tone to indicate that this is a list, and another item is following. But this is not what happens for all words. In Table 14 the stress patterns for words read out in the paradigm of verbs are compared. The paradigm of every one of the four verbs 'know', 'burn', 'reckon' and 'choose' was read out in the order of the table.

Table 14 Stress in list reading

		'know'	'burn'	'reckon'	'choose'
1	Infinitive	xā́ʔɔ́	dā:gɔ̋́	mᵘāt:ɔ́	χārʒɔ́
2	Conditional	χā́ʔɑ́ħ	dā:gɑ́ħ	mᵒāt:ɑ́ħ	χārʒɑ́ħ
3	Polite Sg	χā́ʔɑ́ħə	dā:gɑ́ʁ	mᵒā'ːt:ɑ́ʁə	χārʒɑ́ʁə
4	Polite Pl	χā́ʔi:ʃə	dā:gí:ʃ	mᵒā'ːt:í:ʃə	χārʒí:ʃə
5	Imperative	χā́ʔɔ́l	dā:gɔ́l	mᵒāt:ɔ́l	χārʒɔ́l
6	Imperative Sg	χáʔɔ̄ḷɑ̀ħ	dá:gɔ̄ḷɑ̀ħ	'mᵒát:ɔ̄ḷɑ̀ħ	χárʒɔ̄ḷɑ̀ħ
7	Imperative Pl	χáʔɔ̄lɔ̀ʃ	dá:gɔ̄lɔ̀ʃ	'mᵒát:ɔ̄lɔ̀ʃ	'χárʒɔ̄lɔ̀ʃ
8	Verbal noun	χā́ʔɔ́r	dá:gɔ̀r	mᵘát:ɔ̄r	χārʒɔ́r
9	Purpose	χā́ʔɔ́rħɑ̀mɔ̄	'dá:gɔ̄rˌħɑ̀mɔ̀	'mᵘát:ɔ̄rˌħɑ̄mə	χárʒɔ̄rħɑ̀mɔ́
10	Before	χā́ʔɔ̀lĩɔ́	'dá:gɔ̄ˌlĩə	'mᵘát:ɔ̄ˌlĩə̀	'χárʒɔ̄ˌlĩə̀
11	As much as	χā́ʔ:ɔ̀l	dág:ɔ̄l	mᵘát:ɔ̀l	χār'ʒɔ̄l
12	Until	χā́ʔ:ɔ̀lts	dág:ɔ̄lts	mᵘát:ɔ̀lts	χār'ʒɔ̄lts
13	Causative infinitive	χā́ʔi:tɔ́	dá:gī:tʰ	'mᵘát:ˌī:tɔ̀	'χārʒˌì:tɔ́
14	Present	χǽʔɔ́	dó:gù	mᶜɔ̄t:ú	χōr'ʒú
15	Future	χū́ʔùrdú	'dó:gūrdù	'mʸɔ̄t:ùrˌdú	'χōrʒùrˌdú
16	Imperfect past	χǽʔɔ̀rɔ́	'dó:gūrə̀	ˌmʸɛ̄t:ù'rɔ́	ˌχōrʒù'rɔ́
17	Present participle	χú́ʔūʃ	dó:gūʃ	mʸɛ̀t:úʃ	χōr'ʒūʃ
18	Present noun	χú́ʔūrg	dó:gūrkʰ	mʸɛ̄t:úrkʰ	χōrʒúrkʰ
19	Though	χú́ʔūʃˈɑ̀ħ	'dóg:ūˌʃˈɑ̀ħ	'mʸɛ́t:ūˌʃˈɑ̀ħ	'χórʒ:ūˌʃˈɑ̀ħ
20	Present subjunctive	χū́ʔi:lɔ́	'dó:ˌgī:lɔ̀	ˌmᵘāt:ì:ˈlɔ́	χōrʒ:ī:lɔ̀
21	Present causative	χú́ʔỳ:tū	'dó:ˌgȳ:tù	ˌmᵘāt:ỳ:ˈtú	χórʒȳ:tù
22	General past caus.	χā́ʔi:tìnɔ́	'dá:ˌgī:tìnɔ̋	mᵘāt:ì:tìnɔ́	'χárʒī:ˌtīnɔ̀
23	Recent past	χī́ʔ í	dē:gí	mʸɛ̄t:í	χǽrʒì
24	General past	χī́ʔnɔ́	dǽgnɔ́	mʸɛ̄t:ì'nɔ́	χǽrʒì'nɔ́
25	Past noun	χī́ʔnɔ́rg	dǽgnɔ́rkʰ	mʸɛ̄t:ì'nɔ́rkʰ	χǽrʒì'nɔ́rkʰ
26	Past subjunctive	χī́ʔə̀nī:lɔ́	dǽgnì:lɔ́	mʸɛ̄t:ìnì:lɔ̄	χǽrʒinì:lɔ́
27	Witnessed past	χī́ʔirɔ́	dē:gìrɔ́	mʸɛ̄t:ì'rɔ́	χǽrʒì'rɔ́
28	Past question marker	χī́ʔirī:	dē:gírī:	mʸɛ́'t:írī:	χǽrʒirî:
29	When	χī́ʔtʃɔ́	dǽg'tʃɔ́	ˌmʸɛ̄t:ì'tʃɔ́	ˌχǽrʒì'tʃɔ́
30	Remote past	χī́ʔníɔrɔ̀	'dǽgˌníɔrɔ̄	'mʸɛ́t:ī̀ˌnīɔrɔ̀	'χǽrʒī̀ˌnīɔrɔ̀

Note that rows 1, 2, 5, 24-27 and 29 fully confirm the expected behavior – there is a high tone on the last syllable. Row 30 also shows what could be expected – since they are the last words for each verbal paradigm, they have stress on their "normal" position.

Many rows show a mixed behavior: in some verbal paradigms the main stress is on the first syllable, whereas in other verbal paradigms main stress is on the last syllable. This holds for rows 8-18 and 20-23. This mixed behavior can be explained by assuming that the native speaker only sees some of the words as forming part of a list. Only those words get the main stress on the last syllable. The other words receive their normal stress pattern.

Rows 3,4 and 28 show a different pattern. For most of the words in these rows main stress is on the penultimate syllable. In my previous discussion of trisyllabic words, I claim that the main stress occurs on the penultimate syllable only when the first syllable of the word is a preverb that is not in focus. This is clearly not the case in any of these rows. In relation to these exceptions, I argue that there can be lexical stress on certain suffixes. In the case of row 28, for instance, lexical stress on the penultimate syllable is triggered by the question marker suffix /-ii/. Note that the witnessed past suffix /-ira/ does not attract stress to itself. But the combination of witnessed past tense suffix and question marker suffix causes the main stress to shift towards the first vowel of the past tense suffix, so that it becomes /-írii/. A tableau for one of the words from this row is given in Table 15.

Table 15 A word with lexical stress

Input: /deeg-/ + /-írii/	Max-VV-IO	All-σ-Left	Tone	RhType=T	LeftMost	Max-V-IO	ParseSyl	All-Ft-Left	WSP
a. (dée.gi).rii		**	*!				*		
b. (dée.gi).(rìi)		**	*!					**	
c. (dée).(gi.rìi)		**	*!	*				*	
d. (dée).(gì.rii)		**	*!					*	
e. (dèe).(gí.rii)		**			*!			*	
f. ☞ dee.(gí.rii)		**					*	*	
g. dee.(gír)	*!	*					*	*	

The lexical stress examples show, that faithfulness to tone (i.e. lexical stress) is more important in Chechen than adherence to a strict trochee pattern. But as the form for 'choose' in row 28 shows, the intonation pattern can still override this lexical stress. That means the ranking between these constraints is as follows:

15) INTONATION >> TONE

5. *Stress for the female speaker*

Only a limited number of separate words were elicited from the female speaker. They are given in Table 16. From the female speaker only one recording is available. This is a recording of a story she tells. At the end of this story the speaker gives a list of words with their meaning. It is from that section that the separate words have been elicited.

Despite these limitations I have included the female speaker because she has a much larger and clearer tone range than the male speaker which makes it much easier to mark tone and to determine where the main stress of a word is. Like for the male speaker, the female speaker's words can be divided neatly into trochaic feet where the main stress, the highest tone, is on the leftmost trochee.

Table 16 Words elicited from the female speaker

Ref	Underlying	Surface	Footed	Gloss
1	/tʃe.da/	[ˈtʃɛ́dɜ̄]	(tʃɛ́.dɜ)	wooden.spoon
2	/sa.ta.sa/	[ˈsɜ́tɜ̄sɜ̀]	(sɜ́.tɜ).sɜ	dawn
3	/tʃa.ta.qii.na.taa.tʃa/	[ˈtʃɜ́tɜ́ˌqīːnˌtàːtʃ]	(tʃɜ́.tɜ).(qǐin.taatʃ)	milky.way
4	/sa.daar/	[ˈsɜ́dàr]	(sɜ́.dar)	afternoon.light
5	/sa.daar.ʒar/	[ˈsɜ́ˌdàrʒɜ̀r]	(sɜ́.dar).(ʒɜ̀r)	light.spreading
6	/syl.ħa.naʃ/	[ˈsýlħɜ̀nɜ̀ʃ]	(sýl.ħɜ).(nɜ̀ʃ)	beads
7	/dæn.darg/	[ˈdʲǽndɜ̀rg]	(dʲǽn.dɜrg)	bullet
8	/ger.ma/	[gɛrm]	(gɛ́rm)	gasket
9	/χee.dar/	[ˈχéːdɜ̀r]	(χéː.dɜr)	dish
10	/tʼuo.bie.ram/	[ˈtʼúəˌb̄īərɜ̀m]	(túə.biə).(rɜ̀m)	sourcream
11	/tʃaar.daq/	[ˈtʃárdàq]	(tʃáar.daq)	platform
12	/tʃux.tʃa.ħier/	[ˈtʃœ́χtʃħɛ̀ːr]	(tʃœ́χtʃ.ħeːr)	small.bear

The data in Table 16 shows that in some instances vowel deletion is taking place. Short /a/ deletion occurs at the end of /ger.ma/ for instance, but not at the end of /tʃe.da/. Furthermore it occurs in the middle of /tʃataqiinataatʃa/ and /tʃuxtʃaħier/. With respect to the vowel deletion it should be noted that:

- None of the deleted vowels is part of a root.
- Many non-root short vowels are not deleted (e.g. the last vowel in /satasa/).
- Only short vowels are deleted.
- The deleted vowels would not have born stress if they had been kept.

All in all the results for the female speaker do not essentially differ from the results for the male speaker. Both use trochees, left align them and have the main stress on the leftmost trochee.

6.   Conclusions

It has been shown that the main stress in Chechen usually lies on the first syllable of the word. Chechen stress uses trochaic feet. These feet should start as much to the left as possible. There is downstep between feet (a high tone in the next foot is lowered if preceded by a low tone in the previous syllable). It seems that downstep can be reset at certain word boundaries, but further research would be needed to look into this matter.

Inherent high tone on certain morphemes, as well as intonation are able to break up the normal stress assignment pattern. The "comma" intonation likes a word to end on a high tone when a sentence is not completed. The focus intonation likes the word preceding the focused word to end on a high tone.

Furthermore there is a desire to reduce the number of syllables as much as possible. However, only short vowels that would otherwise have been unstressed, and that are not root-vowels can be deleted. A further limitation on deletion is the possible structure of the syllable onset and coda. Deletion is not obligatory, but seems to depend on the style used by the

speaker. Chechen does not seem to distinguish between light and heavy syllables when it comes to stress assignment.

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8. *Affiliations*

Erwin R. Komen

Leiden University   SIL-International

Department of Linguistics   Erwin_Komen@SIL.org

Netherlands

9. *References*

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