

How modern phonology views the Latvian and Lithuanian tonal contrasts

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0. Introduction

How modern phonological theory understands the Baltic tonal contrasts and what problems it encounters.

- presumably tonal contrasts in the Baltic languages

Lithuanian ‘priegaidės’

acute	<i>skýriai</i> ‘separate’ (2SG.PST.)	<i>táikiai</i> ‘aim’ (2SG.PRS.)
circumflex	<i>skÿriai</i> ‘section’ (NOM.PL.)	<i>taĩkiai</i> ‘peacefully’ (ADV.)

Latvian ‘zilbju intonācijas’

level	<i>mī̃t</i> ‘change’ (INF.)	<i>aūksts</i> ‘cold’ (MASC.)	
falling	<i>mīt̄</i> ‘exist’ (PRS.3)		<i>ràuks</i> ‘pucker’ (FUT.3)
broken	<i>mî̂t</i> ‘tread’ (INF.)	<i>aūksts</i> ‘high’ (MASC.)	<i>raûks</i> ‘yeast’ (NOM.SG.)

- Modern phonological theory is ‘generative’ in that it originates from the Chomskyan tradition, but its concepts and devices may be used independently.
Different from what we are used to in the traditional accounts of the tonal contrasts in the Baltic languages in either Lithuania and Latvia or Russia.

(Halle and Vergnaud 1987: 190–203), (Blevins 1993), (Dogil 1999) on Lithuanian

(Kariņš 1996: 137–150), cf. (Seržants 2006), on Latvian

do not have all the relevant facts at their disposal, authors usually do not read Lithuanian and Latvian themselves and often have to build their research on second-hand information.

1. Autosegmental Representation

The tonal patterns of the Baltic languages; based on (Kariņš 1996: 146) and (Blevins 1993: 243).

Latvian falling tone	Lithuanian acute	
<i>diena</i>	<i>pienas</i>	segmental tier
μ μ	μ μ	moraic tier: μμ — long (heavy), μ — short (light)
H L	H	tonal tier: H — high, L — low

/diena/ ‘day’	/píenas/ ‘milk’	traditional transcription
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Tonal tier. The tonal information is placed on a separate tier, cf. the level of diacritics in the traditional transcription and the division between segments (consonants, vowels) and suprasegmental phenomena (stress, tone).

The motivation for having tones and segments on different tiers largely coincides with the idea behind the traditional division of the segmental and suprasegmental levels, namely, that segments and suprasegmental phenomena are independent of each other. In the Baltic languages, for example, in Lithuanian, this can be demonstrated by the fact that any long syllable can have either acute or circumflex independently of the sounds in the syllable nucleus; see (Girdenis 2003: 270).

Moraic tier. In the traditional phonology of the Baltic languages they are usually not thought of as belonging to an independent level to the extent that we are used to think of suprasegmental things. In spite of that, it has been proved that it is more convenient to treat moras on a separate tier because of the processes that are also well-attested in the Baltic languages (lengthening of vowels after the deletion of nasals in Lithuanian; the representation is also relevant for the Latvian *zoss*).

žansis	>	žansis	>	žąsis	‘goose’
		†		^	
μ μ		μ μ		μ μ	

Moras provide an intermediate level between tones and segments. Not all segments can bear tones, although the restrictions are language-specific. In the Baltic languages, only vowels and sonorants can be associated with tones, and this is reflected by the fact that only vowels and sonorants are moraic, that is, connected with their own moras — in Latvian there can be no **rāksts* with the part of the falling contour associated to the obstruent. Tones are linked to moras ('tone-bearing unites'), rather than directly to vowels and sonorants. (In some languages where tonal patterns are the same for both short and long syllables it makes more sense to view syllables as tone-bearing unites.)

v a l s t s 'country' μ μ H L	r a k s t s 'document' μ H	* r a k s t s 'document' μ μ H L
/vālstʃ/ /rakstʃ/		

2. Contour tones.

Contour tones are usually represented as sequences of level tones.

level tones

high H

low L

contour tones

falling HL

rising LH

rising-falling (convex) LHL

falling-rising (concave, dipping) HLH

Level tones are common in African languages (Bantu). Contour tones are more easily found in Asia (Chinese and Vietnamese). Since modern tonology has its roots in the studies of African tones, it is not surprising that level tones have been taken as tonal primitives.

The problem of representing contours as sequences of level tones is like the problem of treating diphthongs as sequences of independent vowels.

Viewing a contour tone as a sequence of level tones is sometimes justified even in the Baltic languages. (See (Seržants 2006) for a similar analyses of other cases of vowel deletion in Latvian.)

(1) *vajag* > *vāig* 'need' (PRS.3)

a. v a j a g μ μ H L	b. v a j a g μ μ H L	c. v a i g μ μ HL
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- a. No long syllable and no contrastive tone. The tones of the short syllables in *vajag* are predictable from the position: the stressed syllable is given the High tone, and the unstressed syllable is given the Low tone.
- b. In many Latvian dialects the word *vajag* undergoes syncope, so that its unstressed vowel is deleted.
- c. The surviving syllable *vāig* becomes long as it receives *j* which is turned into a moraic element *i* by reassigning it the floating mora together with the tone. The result is the falling tone.

(2) *ne-esi* > *nēsi* 'not be' (2SG.PRS.)

a. n e e s i μ μ μ H L L	b. n e s i ^ μ μ μ H L L
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- a. The three short syllables are given their tones automatically according to their relation to stress.
- b. Two vowels are placed together without any consonant separating them and get conflated into one long vowel so that both moras now come into the same syllable together with their respective tones. The result is the falling tone.

3. Underspecification.

In positions where tones are not contrastive they can be assigned in accordance with various factors. Tonal patterns may partly consist of predictable tones not only in the examples like *vaig* and *nēsi* (see Section 3) but in any other ‘normal’ words where a long syllable is present underlyingly.

The other mora is left unspecified for tone to be assigned the tone that is appropriate depending on the phonetic context. In declarative sentences it will presumably be Low, so that the acute appears as the expected falling contour.

a. unspecified

b. in declarative sentences

acute
pienas
| |
μ μ
|
H

circumflex
šiēnas
| |
μ μ
|
H

acute
pienas
| |
μ μ
| |
H L

circumflex
šiēnas
| |
μ μ
| |
L H

/pienas/ ‘milk’

/šiēnas/ ‘hay’

/pienas/ ‘milk’

/šiēnas/ ‘hay’

In the representation of the Latvian falling tone the predictable tone is different; it is the High tone on the first mora which is assigned under word stress while the Low tone on the second mora is lexically specified.

a. unspecified

b. under word stress

diena
| |
μ μ
|
L

diena
| |
μ μ
| |
H L

/diena/ ‘day’

/diena/ ‘day’

4. Tone is not only pitch

The generally accepted definition of tone in modern phonological theory states that tone is pitch (the quality of a sound that depends on frequency of sound waves) that is used to distinguish words in a language. Do the Baltic tonal contrasts really fit the definition of tone as pitch? What are the phonetic parameters of the Baltic tones?

The phonetic manifestation of the **Lithuanian** ‘priegaidės’ is complex and encompasses several phonetic parameters, such as intensity, duration, and vowel quality, the impact of each of the parameters depending on what segments are found in a particular syllable (Pakerys 1982).

On vowels tonal distinctions are indeed based on pitch, but it is not accidentally that the contrast on vowels is reported as almost non-existent in many Lithuanian dialects as well as in the spoken standard language. On diphthongs and diphthongal sequences the tonal contrast relies on the duration of components and differences in vowel quality.

In Žemayt the role of duration and vowel quality is much less significant, but the acute may be realized as glottal stop.

(Girdenis 2003: 271–274) refuses to define the Lithuanian ‘priegaidės’, as a phonological category, in terms that would suggest any specific phonetic parameter. Instead, he refers to the acute as rough and the circumflex as smooth. From this viewpoint, the tonal analysis that treats the acute as falling and circumflex as rising seems inadequate and even outdated as it is obviously based on early accounts of Lithuanian tones that have lost their significance in the light of more recent developments; but see (Dogil 1999).

Latvian reminds Žemayt in that it uses pitch more than Aukshtayt Lithuanian and one of the three Latvian tones is manifested by glottal stop, as in Žemayt. The analysis of the Latvian tones in

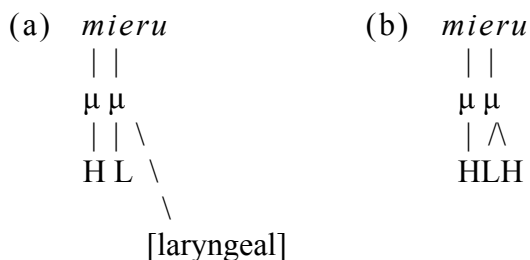
terms of pitch is correct as far as it concerns the level and the falling tones but it is not so evident in the case of the broken tone pronounced with the glottal stop.

The broken tone is shared by most Latvian dialects. The only dialect which relies entirely on pitch in the realization of tones is Selonian where the broken tone is substituted by the rising tone, but even in Selonian the falling tone is accompanied by breathy voice. (Breathy voice is similar to glottal stop in that they both represent different types of phonation which are not pitch.)

5. Latvian broken tone

(a) Described as glottalization, the broken tone does not belong in one category with the level and the falling tone. The representation of the broken tone with the glottal stop like in (Seržants 2006) is rejected by Kariņš in (1996: 147–8) as being non-phonological, although phonetically correct.

Latvian broken tone



/miêru/ ‘piece’ (ACC.SG.)

(b) Kariņš (1996: 149) proposes that the glottal stop is not the main phonetic parameter of the broken tone but simply an effect of the sequence of three tones — HLH being placed in one syllable. The similar approach has been also taken to the Livonian broken tone (Kiparsky) and the glottal stop (‘stød’) in Danish (Itô & Mester).

The idea that the most pronounced parameter in the phonetic implementation of some phonological category is not obligatory the same that represents the category on the level of phonology is connected Phonetic Enhancement when enhancing features are used to intensify the contrast. In languages like Latvian and Lithuanian tones may need enhancing because otherwise the pitch of the lexical tones is harder to perceive because of the pitch used in sentence intonation; see (Gussenhoven & Peters 2004) about the tonal dialects of German and Dutch. In Lithuanian, differences in duration and vowel quality probably simply enhance the contrast that is underlyingly represented by pitch contours.

6. Phonation types

- glottal stop
- creaky voice
- breathy voice

Creaky voice in many languages is not distinguished from glottal stop. Both glottal stop and creaky voice are employed in the phonetic manifestation of the Latvian broken tone and Zhemayt acute. Breathly voice is not found in European languages as a phonological category, but it is used to express emotions (confidentiality).

Types of phonation are related to pitch in that both are produced by the vocal folds in the larynx. Pitch is the result of vibration of the vocal folds, while the types of phonation are determined by different states of the vocal folds (tight or lax).

Types of phonation may be used together with pitch, being incorporated in the tonal inventory or accompanying certain pitch patterns (Burmese).

Register languages use different types of phonation as the primary phonetic manifestation of the contrast that is expressed by pitch in ordinary tone languages. The division between register languages and tone languages is only needed because tone as a phonological category is usually defined by referring to its most common phonetic parameter, which is pitch.

7. Register and Contour in Vietnamese

It was proposed by Pham (2003) that the contrast between the six Vietnamese tones would be better described in terms of two features, Register and Contour.

<p><i>ngang</i></p>	<p><i>huyen</i></p> <p> </p> <p>R</p> <p> </p> <p>[laryngeal]</p> <p> </p> <p>[spread]</p>
<p><i>sac</i></p> <p> </p> <p>C</p> <p> </p> <p>[non-even]</p>	<p><i>nang</i></p> <p>/ \</p> <p>C R</p> <p> </p> <p>[non-even] [laryngeal]</p> <p> </p> <p>[constricted]</p>
<p><i>hoi</i></p> <p> </p> <p>C</p> <p> </p> <p>[curve]</p>	<p><i>nga</i></p> <p>/ \</p> <p>C R</p> <p> </p> <p>[curve] [laryngeal]</p> <p> </p> <p>[constricted]</p>

[constricted glottis] = creaky voice

[spread glottis] = breathy voice

Conclusion

The representation of the Latvian and Lithuanian tones in terms of pitch height is not adequate because it does not account for phonetic parameters other than pitch, especially, for the use of glottal stop and other types of phonation in Latvian and Zhemayt. Although these features may be dispensed with as Phonetic Enhancement, it may be more productive if we assume the model proposed by Pham. The features Register and Contour can be useful for analyzing various cases of interaction between the broken tone and either the rising or the falling tonal patterns observable in dialects of the Baltic languages.

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