Word stress in Rutul

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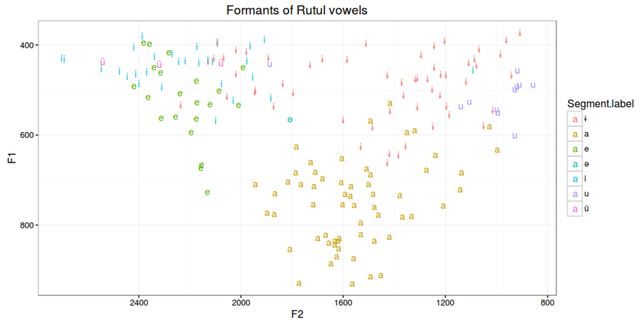
All data is:
https://github.com/melanoya/rutul_stress_ConCorT

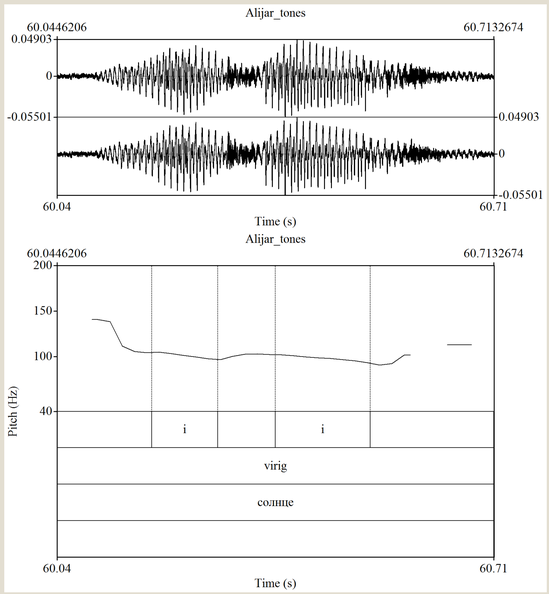
Phonetics



Logistic regression: stress hearing ~ duration + pitch mean + pitch range

Coefficients of logistic regression:

	estimate	std. error	z value	Pr(>|z|)	
(Intercept)	-9.519477	1.999463	-4.761	1.93e-06	***
duration	42.149247	8.392290	5.022	5.10e-07	***
pitch mean	0.021389	0.007373	2.901	0.00372	**
pitch range	0.026379	0.009107	2.897	0.00377	**



Background

Different studies show that stress in Rutul depends on part of the speech and have tendency to follow the first or the second syllable.

1. Weak dynamic stress that turns into a tonic one. In case of nouns, it is on the second syllable from the beginning. [1]

2. Rutul has a pitch accent and stressed syllable has four types of accent [2]:

- High
- Low
- Rising
- Falling

Aims and questions

1. What phonological characteristics influence stress?
2. What are acoustic cues in word stress in Rutul?

Data

Two speakers → 35 minutes → 102 words

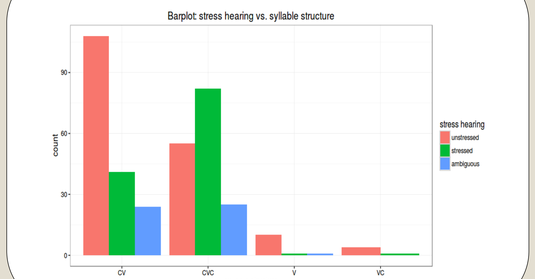
Recordings were annotated in the program for speech analysis Praat.

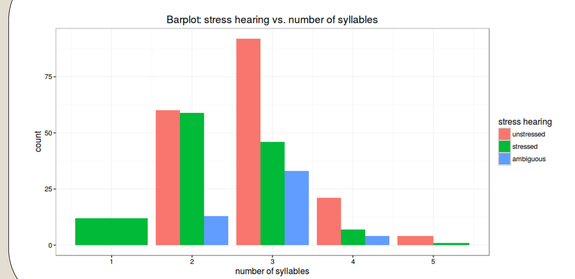
Conclusions

As far as we hear:

- phonetic logistic regression is good
- phonological logistic regression is awful
- all phonetic predictors are relevant for such data
- phonological predictors are not so important, so phonological stress pattern is not depends on syllable structure, number of syllable and so on.
- from barplots we can conclude:
  - stressed syllables are tend to be closed (CVC)
  - second syllables are tend to be stressed
  - vowel [a] is tend to be stressed more often then other vowels

Phonology



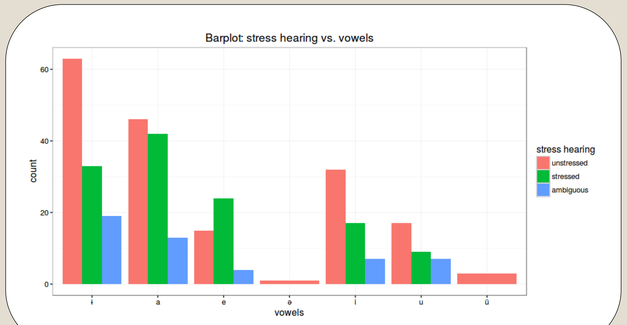


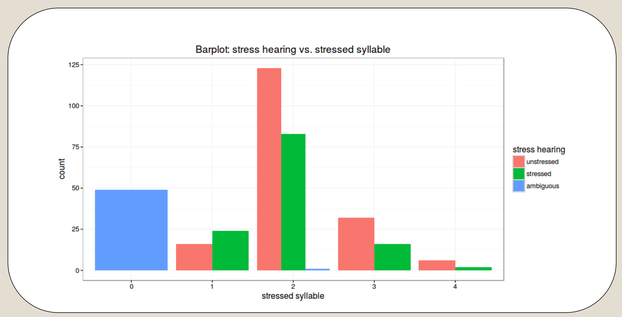
Logistic regression: stress hearing ~ number of syllable + syllable structure + segment label + stressed syllable

	estimate	std. error	z value	Pr(>|z|)	
(Intercept)	1.4863	1.0705	1.388	0.16501	
number of syllables	-0.7189	0.2996	-2.400	0.01642	*
syllable structure CVC	1.4066	0.4412	3.188	0.00143	**
syllable structure V	-1.6033	1.3000	-1.233	0.21745	
syllable structure VC	-0.3057	1.5730	-0.194	0.84593	
segment label e	0.8631	0.7268	1.188	0.23498	
segment label i	-0.1464	0.5809	-0.252	0.80106	
segment label u	-1.7933	0.9133	-1.964	0.04957	*
segment label ü	-15.9716	1362.6100	-0.012	0.99065	
segment label ə	-15.7428	2399.5448	-0.007	0.99477	
segment label a	-1.2061	0.5009	-2.408	0.01605	*
stressed syllable 2	-0.2045	0.6640	-0.308	0.75812	
stressed syllable 3	-0.1527	0.7337	-0.208	0.83514	
stressed syllable 4	0.5233	1.1628	0.450	0.65266	

Predictors of the logistic regression.

number of syllables	syllable structure	wovels	stressed syllable	stress hearing	probability
2	CVC	ɨ	2	11	0.51
2	CVC	a	2	9	0.78
3	CVC	ɨ	2	8	0.34
3	CV	ɨ	2	7	0.11
3	CV	a	2	7	0.29
3	CVC	a	2	7	0.63
3	CV	a	3	7	0.31
3	CV	i	3	7	0.27
2	CV	i	2	6	0.42
3	CVC	ɨ	3	6	0.35
4	CV	a	4	6	0.30
2	CV	ɨ	2	5	0.20
2	CV	a	2	4	0.46
4	CV	a	2	4	0.17
4	CV	i	2	4	0.15
…					





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2. Кибрик А. Е., Кодзасов С. В. Сопоставительное изучение дагестанских языков. Имя. Фонетика. – 1990.