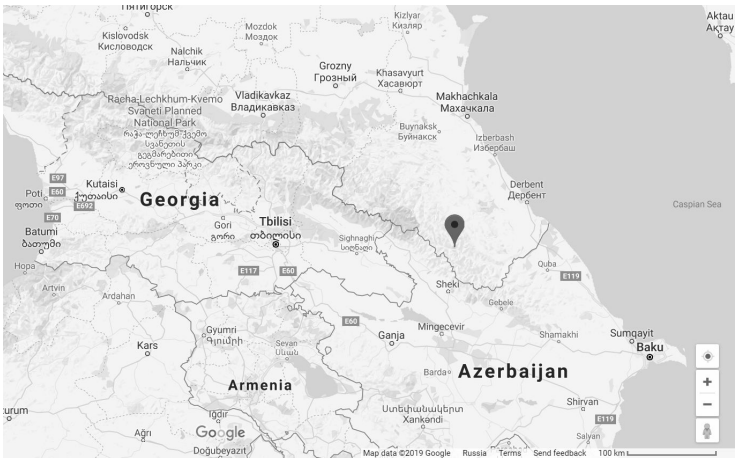
Elatives of Kina Rutul

Polina Nasledskova, Michael Daniel
Linguistic Convergence Laboratory, HSE, Moscow

0. Rutul language

East Caucasian > Lezgic > Rutul

Spoken by approximately 30,000 people in Rutulsky District (Southern Daghestan, Russia) and in some villages of northern Azerbaijan.
The data for this study were collected in the village of Kina during the field session in the summer of 2018.



1. Spatial forms in Kina Rutul

Spatial forms in (most) East Caucasian languages are bimorphemic, including two series of affixes:
Localization - spatial area defined with respect to the landmark (SUP, SUB, POST, IN etc.)
Orientation - motion with respect to the spatial area defined by the localization marker (essive, lative, elative etc.) E.g. *isk'am-a* 'on the table', *isk'am-a-la* 'from the top of the table', *isk'am-a-χda* 'under the table', *isk'am-a-qla* 'from under the table'.

In Rutul, essive (absence of motion) and lative (motion into the spatial area) are not distinguished.

Kina Rutul

	IN	APUD	SUB/POST	SUP	INTER/CONT
essive/lative	-a, -e	-da	-χda	-ø	-k
elative	-a, -ʲa	-da	-χ-la, -q-la	-ø-la	-k-la

Tab. 1. Locative cases of Kina Rutul

For SUB/POST, SUP and INTER localizations, the elative is segmentally expressed by *-la*. The difference between essive/lative vs. elative forms of IN and APUD is more problematic.

Evidence:

- Descriptions of some other dialects suggest a difference in vowel duration (see 2)
- Opinion of Kina speakers (partial support; see 3)

2. Data from other dialects

Luček Rutul (~3km from Kina)

	IN	SUPER	SUB/INTER	APUD	POST
essive/locative	-ø	-ɨ:	-k	-dɨ	-χdɨ
elative	-a:	-(ɨ):lɨ	-kla	-da:	-χla

Tab. 2. Locative cases of Luček Rutul (Alekseev 1994: 222)

In Luček Rutul, there are no localizations where essive/lative and elative forms are segmentally identical.

Rutul Rutul

	IN	APUD	SUPER	POST	INTER/CONT	SUB
essive/lative	-a, -e, -aˤ, -i	-da, -de	-ɨː, -aː	-χda	-k’	-xde
elative	-aː	-daː	-ɨːla, -aːla, -uːla	-qlaː	-k’laː	-k’laː

Tab. 3. Locative cases of Rutul Rutul (Maxmudova 2002: 91)

In Rutul Rutul, IN and APUD elative forms are distinguished from the essive/lative ones by the vowel quantity.
In general, there are similarities to Table 1 above, but the paradigms are not the same across dialects.

3. Speakers’ opinions

Diversion - our speakers do have a good ear:

(1) jik’ heart (2) jɨʁ day

The difference between the essive/lative and elative is not clearly audible, only articulated in isolation and only indicated by some speakers; most confident is the speaker with exposure to the written form of Kina and a practice of writing (Rutul Rutul dialect). In this paper, we instrumentally control whether, in Kina too, in IN and APUD elative forms, the final [a] is longer than in the corresponding essive/lative form.

4. Experimental data

Forms of three nouns were recorded, including *χal* ‘house’ (IN), *dam* ‘forest’ (IN) and *ɢumši* ‘neighbour’ (APUD = Personal locative), in three contexts: essive, lative and elative (for *dam* ‘forest’, only lative and elative contexts were recorded). Records were made with the use of headset (Olympus LS-P1 recorder, Sennheiser HSP 2 headset). Two types of contexts:

- the noun in question is in medial position, the right and the left contexts of the noun are the same (for *χal* 'house' and *dam* 'forest').

(3) Stimulus: "A bear came to the forest and hunters shot him."
si *dam-a* *ji<b>q'ɬ-r,* *ʁɬʕrčekan-iši-r*
bear forest-IN <3>come.PFV-CVB hunter-OBL.PL-ERG
ji<w>χɬ-r
<3>hit.PFV-CVB

(4) Stimulus: "A bear came from the forest and ate a sheep."
si *dam-a* *ji<b>q'ɬ-r,* *č'abal* *li<w>i-r*
bear forest-IN <3>come.PFV-CVB sheep <3>eat.PFV-CVB

- The question-answer pairs, where the noun in the required form is the answer (for *ɢumši* 'neighbour').

(5) Stimulus: "To whom have you given my gun? - To your neighbour."
hal-da *hawɬ-r* *iz-dɬ* *tifang?* – *wɬ-dɬ*
who-APUD 3.give.PFV-CVB I-ATTR gun you-ATTR
ɢumši-je-da
neighbour-OBL-APUD

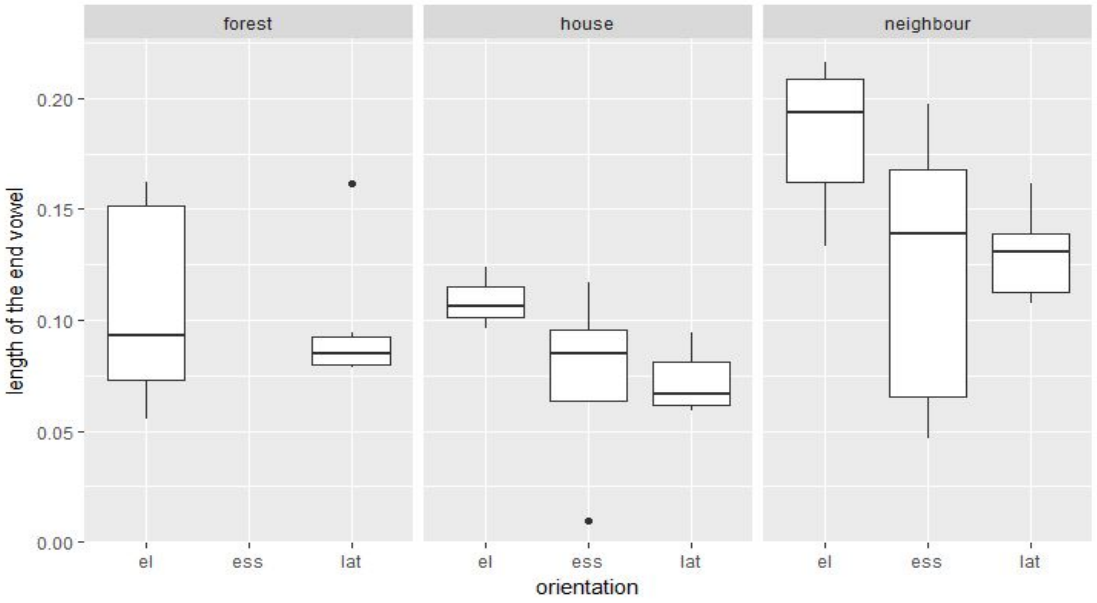
This questionnaire was merged with several other grammatical questionnaires and shuffled, so that there were some four fillers per stimulus. 6 speaker were recorded, including two women (age 37 and 40) and four men (age 17, 44, 58 and 61).

Word	Stimulus	Orientation	N contexts	N speakers
ɢumši 'neighbour'	Where is my gun now? - At your neighbour's.	essive	8	6
	To whom have you given my gun? - To your neighbour.	lative	6	5
	From whom did you get my gun? - From your neighbour.	elative	7	6
χal 'house'	We were not home yesterday, we were at the wedding.	essive	4	4
	We came home and it turned out that our cow ran away.	lative	6	5
	We left home as there was no light.	elative	6	4
dam 'forest'	The bear came to the forest and was shot by the hunters.	lative	6	5
	The bear came from the forest and ate a sheep.	elative	5	4

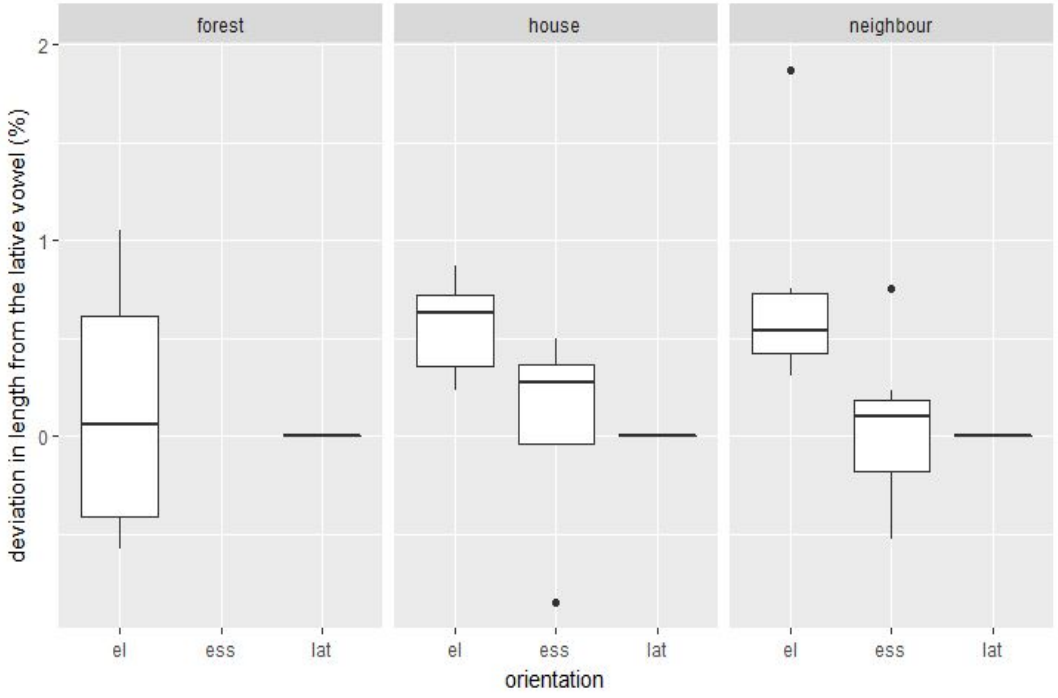
Tab. 4. Number of stimulus.

For every noun in IN and APUD, the absolute length and intensity of the last vowel were measured. The absolute vowel length was measured from the first to the last visible period of modal voice. For intensity, the maximum value was taken within the vowel duration.

4. Exploratory charts



On Fig. 1, the boxplots show the distribution of the absolute vowel quantity in the elative, essive and lative. Using question / answer pair seems to increase the duration as compared to phrasal contexts. Effect of phrasal focus? The difference for *dam* 'forest' is problematic.



On Fig. 2, the boxplots show the distribution of the vowel quantity in the elative and in the essive forms as normalized against the vowel quantity in the lative form for the same speaker. The difference between question / answer pair and phrasal context is lost. The token dam 'forest' remains problematic.

5. Model

Two mixed effects models were used: a **logistic** regression model predicting the interpretation (essive/lative vs. elative) from the duration of the vowel and **linear** regression predicting the duration of the vowel from the spatial interpretation (essive, lative or elative). Speakers and words were taken as random effects.

- linear regression (length ~ speaker + word + intensity + orientation)
- logistic regression (orientation (binary coded)) ~ speaker + word + intensity + length)

Linear regression shows that the category of orientation is the most important predictor (p-value = 0.0006) of the vowel quantity. Also, the difference between elative and the other forms is significant, while difference between essive and lative is not.
Logistic regression shows that vowel quantity is the most important predictor (p-value = 0.0035) for distinguishing essive/lative from elative. We also plan to use a polynomial regression model that predicts the interpretation (three options: essive, lative or elative) with the same set of predictors.

```
Linear mixed model fit by REML. t-tests use Satterthwaite's method ['lmerModLmerTest']
Formula: deviation ~ orientation + int + comment + (1 | speaker) + (1 |      word)
   Data: df2

REML criterion at convergence: 116.4

Scaled residuals:
     Min       1Q   Median       3Q      Max
-2.39536 -0.28625  0.07789  0.28625  3.07856

Random effects:
 Groups   Name        Variance Std.Dev.
 speaker  (Intercept) 0.00000  0.0000
 word     (Intercept) 0.02052  0.1432
 Residual             0.79749  0.8930
Number of obs: 45, groups:  speaker, 6; word, 3

Fixed effects:
                   Estimate Std. Error        df t value Pr(>|t|)
(Intercept)        -0.222771   0.362592  2.035140  -0.614  0.60059
orientationel       1.067693   0.368023 38.858737   2.901  0.00609 **
orientationlat      0.011403   0.372317 38.289573   0.031  0.97573
int                 0.004838   0.168419 38.004667   0.029  0.97723
commentcontrastive -0.017073   0.749398  9.294070  -0.023  0.98231
commentmiddle      -0.341105   0.372178  1.030871  -0.917  0.52401
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Correlation of Fixed Effects:
            (Intr) orinttnl ornttnlt int    cmmntc
orientatinl -0.598
orientatnlt -0.578  0.657
int          0.453 -0.235   -0.229
cmmntcntrst -0.287 -0.079   -0.093   -0.329
commentmddl -0.563 -0.063   -0.099   -0.428  0.452
convergence code: 0
singular fit
```

Fig. 3. Linear regression output.

```
Generalized linear mixed model fit by maximum likelihood (Laplace Approximation) ['glmerMod']
 Family: binomial  ( logit )
Formula: ort ~ (1 | speaker) + (1 | word) + int + deviation + comment
   Data: new_df2

     AIC      BIC   logLik deviance df.resid
    58.0     70.7    -22.0     44.0       38

Scaled residuals:
    Min      1Q  Median      3Q     Max
-1.6537 -0.6000 -0.4000  0.5253  4.4463

Random effects:
 Groups  Name        Variance Std.Dev.
 speaker (Intercept) 0        0
 word    (Intercept) 0        0
Number of obs: 45, groups:  speaker, 6; word, 3

Fixed effects:
                  Estimate Std. Error z value Pr(>|z|)
(Intercept)        -0.8408     0.6545  -1.285  0.19892
int                 0.3916     0.5022   0.780  0.43551
deviation           1.6990     0.5824   2.917  0.00353 **
commentcontrastive -0.1488     2.0215  -0.074  0.94131
commentmiddle       0.3454     0.8987   0.384  0.70074
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
            (Intr) int    devitn cmmntc
int          0.296
deviation   -0.157  0.099
cmmntcntrst -0.381 -0.353 -0.075
commentmddl -0.808 -0.467  0.120  0.365
convergence code: 0
singular fit
```

Fig. 4. Logistic regression output.

<u>Interim conclusion: There is a statistically significant difference in the vowel quantity in the essive/lative vs. elative forms.</u>

It remains to be seen whether the speakers perceive this difference, and, if yes, what is their achieved precision? As speakers hesitate when asked if the end vowel is long or short, it might be a case of 'near merger'. Near merger is the phenomenon observed in sociophonetics when "speakers appear to be able somehow to hear subtle phonetic differences well enough to reproduce them but without enough conscious attention to know that they are actually hearing them" (Gordon 2003: 6). To establish whether this explanation is relevant for our case, it is necessary to carry out a perceptual experiment.

6. Perceptual experiment

The experiment is planned for the field trip in June 2019. Design is as follows:

1. Providing triplets of Russian stimuli in which a translation of one of the nouns above is used in one of the three contexts (essive, lative, elative).
   'A bear came to the forest and hunters shot him.'
   'A bear came from the forest and ate a sheep.'
   'Hunters shot the bear in the forest.'
2. Playing a Rutul spatial form extracted from the forms recorded in the first experiment with 'masked' (die-out amplitude) right and left contexts.
3. Ask the speaker which is the Russian stimulus sentence in whose translation the form is better used.

The expectations are that if the speakers do perceive the difference between the essive/lative and elative forms in actual language use **without** context support, they will correctly tell elative forms from the essive/lative ones while not being able to distinguish between nouns extracted from essive and lative sentences. In the latter case, the subjects' expected reaction is either explicit arguing that the forms to be used in the translation of the essive and lative are the same; or random ascription to one of the two contexts; depending on the speaker's linguistic awareness.
We also consider manipulating with vowel quantity and intensity (reducing quantity and intensity in Praat using Modify and Convert functions) in actual recordings so as to assess the impact of intensity and duration as perceptual cues.

7. Structural correlate - Adverbial support?
Kina Rutul has spatial adverbs with semantics closely parallel to that of some of the spatial nominal forms. Elative forms of the nouns are often followed by lative forms of spatial adverbs, describing the whole path instead of just the Source:

(6) *je* *naq'a* *χal-a:* *ʁa-ʔ* *d-ɬxɬ-r,* *χal-a*
we yesterday house-IN.EL out-LAT HPL-go.PFV-CVB house-IN.ESS
remont *ani* *i*
renovation be.CVB COP
'Yesterday we left the house, as the house was being renovated (lit. 'there was renovation in the house').'

(7) *get* *škaf-a-la* *sa-ʔ* *o<w>či-r=a*
cat wardrobe-SUP-EL down-LAT <3>jump.PFV-CVB=be
'The cat jumped down from the wardrobe.'

It might be the case that, because perceptual difference between essive/lative vs. elative forms is small, it is supported by adverbs that would disambiguate the orientation category of the noun. We plan to check in the corpus whether elative contexts for IN and APUD vs. other localizations show a preference for adverbial support.

7. Conclusion
The study has established, for the forms of IN and APUD localization of Kina Rutul, Lezgic, East Caucasian, that essive/lative forms do differ from elative forms by the quantity of the vowel in the marker, as suggested for the Rutul of Rutul (standard variety). Instrumental analysis shows that the difference is statistically significant, even if one of the tokens ('forest') remains unclear in this respect; maybe, a different normalization procedure would produce better results. It remains to be seen whether the speakers can detect this difference perceptually. We hypothesis that the use of spatial adverbs may compensate for the weakening of the orientation distinction in IN and APUD localizations.

List of abbreviations
2 - second noun class, 3 - third noun class, ATTR - attributivizer, COP - copula, CVB - converb, EL - elative, ERG - ergative, HPL - human plural, LAT - lative, OBL - obique stem, PFV - perfective stem

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