

Modelling complex numerals as part of Inari Saami revitalising

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Traditionally, complex (multi-word) Inari Saami numerals, such as 53, inflect for number and case throughout the word form in a way that is similar to, but not identical to, the pattern known from Finnish. Among young and new speakers, there is a tendency to inflect only the final part and treat the numeral as an opaque stem, or even to use only the nominative form. Looking at texts for correct forms is of no help, since complex numerals are typically written with Arabic numbers, as in example (1) taken from the Inari Saami corpus SIKOR:

- (1) *já sāmikielâlâš máttááttâs finnim uáppei lohomeeri Suomâ vuáđuškoovlâin lii kiäppánâm suullân 50:jn 1990-lovo aalgâ rääjist.* (SIKOR)

and the number of pupils receiving Sámi instruction in Finnish primary school had been reduced to about 50 at the beginning of the 1990ies.

The numeral "50:jn" is a comitative form, intended to represent the wordform *viidáinluvvijn*, but the distributed inflection is not shown in writing. We have been able to find only one example of explicitly inflected complex numerals in SIKOR:

- (2) *Njuovvâm maŋa tiäddu tiädust-uv kiäppán viidáinluvvijn prosenttain* (SIKOR)

slaughtering after weight of.course decreased five.SG.COM.ten.SG.COM percent
Naturally, the weight decreased by 50 % after slaughtering

The system of complex numeral inflection is as follows: In singular, the non-final parts of the numeral are (short) genitive singular forms, whereas the final part is inflected for case. In Finnish, on the other hand, all parts are inflected. Cf. table 1, which shows the singular case forms of the numeral *vitlovkumâ* '53'.

Case	Inari Saami	Case	Finnish
Nom	vitlovkumâ	Nom	viisikymmentäkolme
Gen	viđâlovkuulmâ	Gen	viidenkymmenenkolmen
Ill	viđâlovkuulmân	Ill	viiteenkymmeneenkolmeen
Loc	viđâlovkuulmâst	Ela	viidestäkymmenestäkolmesta
Com	viidáinluvvijnkulmáin	Ade	viidelläkymmenelläkolmella

Table 1: Numeral forms in singular

In plural, Inari Saami and Finnish show the same pattern: Full case and number agreement across the board. The historically recent comitative plural shows a deviant pattern, as

expected: The nonfinal parts occur in genitive plural, with the clitic case ending added to the final part. Cf. table 2, which shows the plural case forms of the numeral *vitlovkulmâ* ‘53’.

Case	Inari Saami	Case	Finnish
Nom	viidahlovehkuulmah	Nom	viidetkymmennetkolmet
Gen	viidâiluvijkuulmâi	Gen	viisienkymmenienkolmien
Acc	viidâidluuvijdkuulmâid	Acc	—
Ill	viidâidluuvijdkulmâid	Ill	viisiinkymmeniinkolmiin
Loc	viidâinluuvijnkuulmâin	Ela	viisistäkymmenistäkolmista
Com	viidâiluvijkuulmâiguin	Ade	viisilläkymmenilläkolmilla

Table 2: Numeral forms in plural

We modeled a finite-state transducer for the plural forms (the ones with full agreement) as follows, for simplicity restricted to numerals between 20 and 99, although the same pattern holds for higher numerals as well: Each of the classes of numeral parts (tens, ten, ones) were inflected for the 6 cases shown in table 2, giving rise to $6 \times 6 \times 6 = 216$ forms for each 3-part numeral. In order to block the generation of non-existing forms, we added a so-called DIACRITICAL FLAG on each case ending, as shown in (3), where U = unification, nc = number-case, PLoc (etc.) = number-case values (for a presentation of diacritical flags, see Beesley and Karttunen 2003, chapter 8).

- (3) a. viidâin@U.nc.PLoc@luuvijn@U.nc.PLoc@kuulmâin@U.nc.PLoc@
 b. viidâin@U.nc.PLoc@luuvij@U.nc.PGen@kuulmah@U.nc.PINom@

Forms like the ones in (3a), with corresponding number-case values, are accepted by the language model, whereas forms with conflicting values, like the ones in (3b), will be ruled out during compilation. For the partial agreement forms in singular we added flags @U.nc.attr@, so that genitive, locative and illative singular all were unified with this flag. The result was a transducer analysing and generating all and only the attested complex numeral forms.

We intend to include the transducer in an interactive language teaching program and let it be used by learners of Inari Saami. In our talk, we will report on the pedagogical effects of teaching complex numerals with support of this program.

Literature

Beesley, Kenneth and Lauri Karttuen 2003: *Finite-State Morphology: Xerox Tools and Techniques*. Stanford.

SIKOR = UiT The Arctic University of Norway and the Saami Parliament's Saami text collection. Version 01.12.2021. URL: <http://gtweb.uit.no/korp/>.