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INTONATION IN BESERMAN UDMURT AND MOKSHA INVERSE ATTRACTION CONSTRUCTIONS

1. Introduction

- Beserman Udmurt and Moksha Mordvin have at least two "usual" relativization strategies:
  - Externally-headed relative constructions

(1) BESERMAN UDMURT — external head
pânâ kud-iz-lâš' *mon kâška-š'ko kâl'l'-e š'âres vâl-ân*
dog which-POSS.3SG-GEN2 I fear-PRS lie-PRS.3SG road on-IN
'The dog I fear is lying on the road.'

(2) MOKSHA — external head
uča-s', ***kona-n'*** *mon rama-jn'ə is'ak,*
sheep-DEF.SG which-GEN I buy-PST.3.O.1SG.S yesterday
ašč-i kut't' vaksə
be.situated-PST.3SG house.DEF.SG.GEN near.IN
'The sheep I bought yesterday is lying in front of the house'.

  - Internally-headed relative constructions, represented by **correlatives**

(3) BESERMAN UDMURT — correlative
kud-iz-lâš' ***pânâ-lâš'*** *mon kâška-š'ko kâl'l'-e š'âres vâl-ân*
which-POSS.3SG-GEN2 dog-GEN2 I fear-PRS lie-PRS.3SG road on-IN
'The dog I fear is lying on the road.'

(4) MOKSHA — correlative
kona uča-t', *mon rama-jn'ə is'ak,*
which sheep-DEF.SG.GEN I buy-PST.3.O.1SG.S yesterday
ašč-i kut't' vaksə
be.situated-NPST.3SG house.DEF.SG.GEN near.IN
'The sheep I bought yesterday is lying in front of the house.'

- Both languages have one more type of relative construction, namely **inverse attraction.**
- Inverse attraction (IA): the head of the relative clause is marked for the case which is assigned to the corresponding participant in the subordinate clause.

(5) BESERMAN UDMURT — NOM → GEN2[1]
pânâ-lâš' kud-iz-lâš' *mon kâška-š'ko kâl'l'-e š'âres vâl-ân*
dog-GEN2 which-POSS.3SG-GEN2 I fear-PRS lie-PRS.3SG road on-IN
'The dog I fear is lying on the road.'

(6) MOKSHA — NOM → GEN
uča-t', ***kona-n'*** *mon rama-jn'ə is'ak,*
sheep-DEF.SG.GEN which-GEN I buy-PST.3.O.1SG.S yesterday
ašč-i kut't' vaksə
be.situated-NPST.3SG house.DEF.SG.GEN near.IN
'The sheep I bought yesterday is lying in front of the house.'

[1] GEN2, not NOM expected in the subject position.

- IA is predominantly found in ancient Indo-European languages (Touratier 1980; Bianchi 1999).
- IA turned out to be relatively wide-spread in Finno-Ugric languages:
  - Our data so far: 12 languages (14 language varieties) belonging to 5 genera within the Finno-Ugric family
  - IA is present in at least 4 of the 6 Finno-Ugric genera;

Table 1. Acceptability of inverse attraction in Finno-Ugric languages[2]

Genus	Language	Variety	Inverse attraction
Finnic	Estonian		?/*
	Finnish	standard	*
		Ingrian Finnish	OK
	Izhor	Lower Luga	OK
	Votic	Lower Luga	OK
Mari	Meadow Mari	Volga dialect	OK
	Hill Mari		OK
Mordvin	Erzya	standard	*
		Shoksha	OK
	Moksha	standard	OK/*
		Central dialect, Temnikovsky district	OK
Permic	Komi-Zyrian	Izhma Komi	*
	Udmurt	standard	OK/*
		Beserman	OK
Ugric	Hungarian		*
	Khanty	Kazym	*

- Inverse attraction **?** → correlatives (clause-internal case marking)
  → headed relatives (position at the left side of the relative clause)

- The first approach is more well-established in the literature (Lancelot 1696: 279–280; Bianchi 1999; Bhatt 2005).
- We will compare the properties of these three types of relative constructions in order to test each of these hypotheses.
- Two Finno-Ugric languages:
  - Beserman Udmurt;
  - Moksha.[3]
- Two aspects:
  - Syntactic properties (**2**), for more details, see (Kholodilova, Privizentseva 2015);
  - Prosodic patterns (**3**).

2. Syntax

a. Left-dislocated position of the relative construction

- IA is basically found in the same positions as correlatives;
- These positional restrictions do not apply to externally headed RC.

[2] We would like to thank our colleagues for their immense help in collecting the data. We gratefully acknowledge help from Anna Agafonova (Estonian), Aigul Zakirova (Meadow Mari), Ruslan Idrisov (Standard Udmurt), Nadezhda Kabaeva (Standard Moksha), Egor Kashkin (Komi, Shoksha Erzya), Natalia Kuznetsova (Finnish, Estonian, Votic, Izhor), Mehmed Muslimov (Izhor), Polina Pleshak (Komi), Fedor Rozhanskiy (Votic), Ksenia Shagal (Standard Erzya), and Olga Urasinova (Standard Udmurt).

[3] Moksha data are discussed in more detail in (Privizentseva 2016).

(7) MOKSHA external head / *IA

vandi *sa-j* *jalga-z'ə* / **jalga-z'ə-n'd'i,*
tomorrow come-NPST.3SG friend-3SG.POSS.SG friend-3SG.POSS.SG-DAT
kona-n'd'i *t'ɛš-n'ə-n'* *s'orma-t*
which-DAT write-IPFV-NPST.1SG letter-PL
'Tomorrow comes my friend, to whom I wrote letters.'

b. Movement out of the relative construction

- For the first time this criterion was applied in (Belyaev 2012) as an argument that the construction in question is in fact a correlative;

(8) BESERMAN UDMURT (Belyaev 2012) NOM → DAT

mon ***pin'al-lə*** ***kud-iz-lə*** *vož-m-e* *pot-i,* *so* *pegž'-i-z*
I child-DAT which-POSS.3-DAT green-1POSS-ACC go_out-PRT this run.away-PRT-3
'The child, at whom I got angry, ran away.'

- It is possible to place some elements of the dependent clause before the relative pronoun and the head in correlatives (18), (20);
- The same is true for relative clauses with IA, however, it is disallowed for regular relative clauses with external head(19), (21);

(9) BESERMAN UDMURT correlative

mən-a-m *vən-e* ***kud-iz-lə*** ***eš-e-lə***
I-GEN1-POSS.1 brother-POSS.1SG which-POSS.3-DAT friend-POSS.1SG-DAT
gož-ja-z *piš'mo* *ž'og-en* *ləkt-o-z*
write-MULT-3 letter quickly-INSTR come-FUT-3
'My friend to whom my brother wrote letters will arrive soon.'

(10) BESERMAN UDMURT NOM → DAT

mən-a-m *vən-e* ***eš-e-lə*** / ****eš-e***
I-GEN1-POSS.1 brother-POSS.1SG friend-POSS.1SG-DAT friend-POSS.1SG
kud-iz-lə *gož-ja-z* *piš'mo* *ž'og-en* *ləkt-o-z*
which-POSS.3-DAT write-MULT-3 letter quickly-INSTR come-FUT-3
'My friend to whom my brother wrote letters will arrive soon.'

c. Determiners (demonstratives or quantifiers) in the head NP

- The head of the correlative cannot be modified with determiners;
- The head of the regular headed relative clause and IA-construction allows this kind of modification.

(11) BESERMAN UDMURT NOM → DAT

ta ***soš'ed-e*** / ***soš'ed-e-lə*** ***kud-iz-lə***
that neighbor-POSS.1SG neighbor-POSS.1SG-DAT which-POSS.3-DAT
mon *š'ot-i* *n'an'* *ul-e* *gord* *korka-n*
I give-PRT bread live-PRS.3SG red house-IN
'That neighbor to whom I gave bread lives in the red house.'

(12) BESERMAN UDMURT correlative

(ta*)** ***kud-iz-lə*** **(**ta*)** ***soš'ed-e-lə*** *mon* *š'ot-i*
that which-POSS.3-DAT that neighbor-POSS.1SG-DAT I give-PRT
n'an' *ul-e* *gord* *korka-n*
bread live-PRS.3SG red house-IN
'That neighbor, to whom I gave bread, lives in the red house.'

d. Non-restrictive interpretation

- Correlatives do not have a non-restrictive interpretation (Strivastav 1991; de Vries 2002) ;
- IA can have both restrictive and non-restrictive semantics.

(13) MOKSHA NOM → GEN

mon' *al'ɛ-z'ə-n',* *kona-n'* *šav-əz'*
I.GEN father-1SG.POSS.SG-GEN which-GEN beat-PST.3.O.3PL.S
xuliga-t'n'ə, *ašč'-i* *bol'n'ica-sə*
hooligan-DEF.PL be-NPST.3 hospital-IN
'My father, who has been beaten by hooligans, is in the hospital.'

(14) MOKSHA correlative

**kona* *al'ɛ-z'ə-n'* *šav-əz'* *xuliga-t'n'ə,*
which father-1SG.POSS.SG-GEN beat-PST.3.O.3PL.S hooligan-DEF.PL
ašč'-i *bol'n'ica-sə*
находиться-NPST.3 hospital-IN
'My father, who has been beaten by hooligans, is in the hospital.'

e. Number and case mismatches

- If the head noun is semantically plural but does not have any surface markers of plurality, it is possible to use both singular and plural relative pronouns;
- Semantic agreement is disallowed in correlatives.

(15) BESERMAN UDMURT NOM → DAT

š'emja / ***š'emja-lə*** ***kud-iz-lə*** / ***kud-jos-əz-lə***
family family-DAT which-POSS.3-DAT which-PL-POSS.3-DAT
mi *š'ot-i-m* *kartoška* *tros* *šumet-o*
we give-PRT-1PL potato a.lot make.noise-PRS.3PL
'The family to whom we gave potatoes makes a lot of noise.'

(16) BESERMAN UDMURT correlative

kud-iz-lə / ****kud-jos-əz-lə*** ***š'emja-lə*** *mi* *š'ot-i-m*
which-POSS.3-DAT which-PL-POSS.3-DAT family-DAT we give-PRT-1PL
kartoška *tros* *šumet-o*
potato a.lot make.noise-PRS.3PL
'The family to whom we gave potatoes makes a lot of noise.'

Table 2. Headed relatives vs. inverse attraction vs. correlatives: summary[4]

Properties / type of relative	Correlative	Inverse attraction	"Regular" relatives with external head
a. Left-dislocated position of the relative construction	obligatory	obligatory	possible
b. Movement out of the relative clause	OK	OK	*
c. Determiners (demonstratives or quantifiers) in the head	*	OK	OK
d. Non-restrictive interpretation	*	OK	OK
e. Number and case mismatches	*	OK	OK

- Some more properties of IA, "regular" externally-headed relatives and correlatives were examined
  - The ability to be extraposed shows the difference between IA and correlatives on the one hand and relatives with external head on the other;
  - Declension of the relative pronoun, the set of possible relativizers and coordination with a noun phrase group together IA and "regular" externally-headed relatives.

Brief summary: some properties of IA and correlatives distinguish them from externally headed relatives, while others, on the contrary, group together IA and "regular" externally-headed relatives.

[4] Very similar syntactic properties of IA, regular headed relatives, and correlatives are observed in Ingrian Finnish (Kholodilova 2013).

3. Prosody

- "The decisive argument about the embeddedness or non-embeddedness of the relative construction [under inverse attraction. — authors] in the main clause can certainly be only the intonation" (Lehmann 1984: 351)[5].

3.1. Experimental design

- A reading experiment with native speakers of Beserman Udmurt[6] and Moksha;
- Native speakers were asked to read out small texts that contained a relative construction.
  - 6 native speakers of Beserman Udmurt and 5 speakers of Moksha;
  - 5 sets of texts, three text in each set and, thus, 15 sentences for each speaker;
- Each set contained three texts.

I. I cannot go inside. *The dog that I fear lies on the road*. Chase it away!
II. Go with me! *The dog that I fear lies on the road*. I fear to go alone.
III. I don't want to leave the house. *The dog that I fear lies on the road*. I will wait till it goes away.

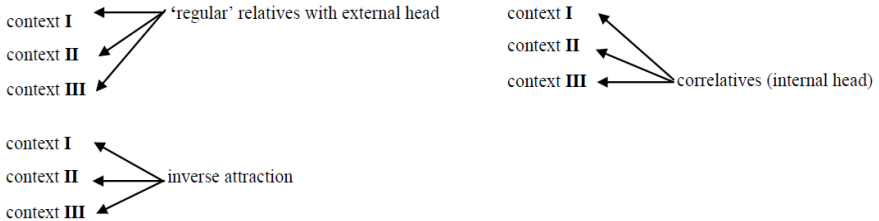
- Different types of relative construction were used in contexts I–III

Table 3. Example of an experimantal list

Context	Set	Type of RC
I	1	headed
	2	IA
	3	correlative
	4	headed
	5	IA
II	1	correlative
	2	headed
	3	IA
	4	correlative
	5	headed
III	1	IA
	2	correlative
	3	headed
	4	IA
	5	correlative

- In order to avoid the influence of contexts three experimental lists were used
  - One and the same type of a relative construction was inserted in different contexts

Figure 2. Matching between different relative types and contexts



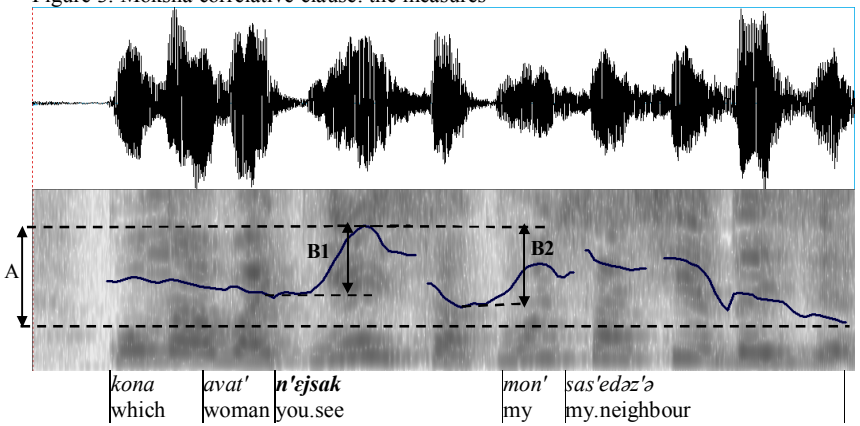
[5] "Letzte Gewißheit über die Integration oder Nicht-Integration der RK in den Hauptsatz könnte freilich nur die Intonation erteilen" (Lehmann 1984: 351).

[6] We wish to thank Alexey Kozlov for his help in collecting Beserman Udmurt data.

3.2. Measurements

- F_0 measurements in Praat (Boersma, Weenik 2016);
- Procedure:
  - Normalization (using an add-on for Praat http://www.praatvocaltoolkit.com/normalize.html);
  - Pitch range settings at 50 to 500 Hz;
  - All the measurements are extracted "semi-manually", using the functions "Get minimum pitch" and "Get maximum pitch";
  - All the values are rounded to the nearest tenth.
- Primary measures:
  - **A**: pitch range of the sentence;
  - **B**: pitch rises and falls on the last word of the relative clause;

Figure 3. Moksha correlative clause: the measures



'The woman you see is my neighbor.'

Further adjustments:

- If the rise or the fall is less than 10 % of the pitch range of the sentence pitch range, it is not taken into account, in other words,

  B / **A** < 0.1 → **B** is not considered

3.3. Results and analysis

- Correlatives tend to have a rising-falling accent;
- The difference between correlatives and IA constructions in both languages is statistically significant (χ^2, $p < .05$).

Table 3. F_0 measurements for Moksha and Beserman Udmurt relative clauses

		rising-falling accent	other	total	ratio of rise-fall
Moksha	correlatives	27	8	35	**0,8**
	inverse attraction	18	17	35	0,5
	externally-headed relatives	20	15	35	0,6
Beserman Udmurt	correlatives	11	16	27	**0,4**
	inverse attraction	5	25	30	0,2
	externally-headed relatives	9	20	29	0,3

- Since information structure differences are controlled for by using the same set of contexts, such a distinction might be indicative of a difference in their prosodic structure;

- **Our (tentative) suggestion:** correlatives might constitute intonational phrases (ι's), unlike inverse attraction and regular headed relative constructions.
  - The basic terminology:
    - All types of relative clauses, as XPs, are related to at least one **phonological phrase (*φ*)** (Truckenbrodt 1999);
    - Only those *φ*'s that correspond to a string of XPs "in some way external to the root sentence they are associated with" can build **intonational phrases (*ι*'s)** outside the matrix clause (Nespor, Vogel 2007: 188)

- Syntactic data in favour of this idea:
  - Correlatives are usually defined as left-detached and positioned outside the main clause, see, e. g., Lipták (2009: 7).
  - Intonational phrases are normally associated with larger syntactic units, see (Selkirk 2011; Hamlaoui, Szendrői 2015: 79–80). Correlatives are known to be less nominalized (Lehmann 1984, 1986), i.e. have a more complex syntactic structure.
  - Separate intonational phrases are often postulated for non-restrictive relative clauses (Nespor, Vogel 2007: 188–189;), which are also known to be less nominalized.

4. Conclusions

- Most crucially: whatever the reason, inverse attraction constructions do not pattern phonologically with correlatives. The popular view according to which inverse attraction is syntactically close to or indistinguishable from correlatives is therefore challenged not only by syntactic data, but also by the phonological tendencies.
- The supposed underlying difference is in the amount of phonological structure.
- Correlatives could probably constitute intonational phrases, unlike other relative clauses.

- Plans:
  - Desirable further evidence in favor of this suggestion would include some data on segmental processes at the right edge of the relative clauses and the pausation patterns.
  - It is desirable to compare the intonational patterns with questions, declaratives, and non-restrictive relatives.
  - The research is ongoing and suggestions are welcome.

Abbreviations

ACC — accusative; DAT — dative; DEF — definite; FUT — future; GEN — genitive; IN — inessive; INSTR — instrumental; IPFV — imperfective; MULT — multiplicative; N — neuter; NOM — nominative; NPST — nonpast; O — patient-like argument of canonical transitive verb; PL — plural; POSS — possessive; PRS — present; PRT — preterite; PST — past; S — single argument of canonical intransitive verb; SG — singular.

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