Second-order Merge Features

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Abstract: This paper investigates relative clauses in Moksha. It shows that relatives with inverse case attraction are obligatorily positioned at the left edge and argues for movement to this position. As there is no clear semantic or syntactic trigger for this movement, it is suggested to instantiate the forced ex-situ pattern, a type of syntactic derivation where two syntactic objects form a constituent at an intermediate stage of the derivation, but never in the resulting structure. The pattern is best derived if second order merge features are assumed. This means that selection applies not only for category, but also for further syntactic features. This research provides novel evidence for feature-driven merge.

Key words: relative clauses, inverse case attraction, feature-driven merge, second order features, forced ex-situ, labeling

1 Introduction

The goal of this paper is to make the case for second-order merge features. Second-order merge features are simply subfeatures on features that underlie syntactic selection. In the model where merge is feature-driven syntactic selection typically applies for a category; see a merge feature on the verbal head in (1) that selects for a DP. Notation [•F•] is used to indicate merge features (see Heck & Müller 2007).

(1) Regular merge feature: V [•DP•]

In this paper, I would like to propose that syntactic selection may apply not only for category, but also for active features. For the case in (1), this means that a verbal head can select not just for a DP, but may further specify which active

features the selected syntactic object has. This is illustrated in (2), where the verbal head selects for the DP with an active case probe:

(2) Second-order merge feature: $\overset{\text{V}}{[\bullet \text{DP}_{[*\text{case}*]} \bullet]}$

Such second-order merge features allow to determine very locally, at the point of the selection, how a selected syntactic object will behave later in the course of the derivation. Starting with the novel data on relative clauses in Moksha, I will show that there are indeed cases that require the derivational path of a syntactic object to be known at an earlier stage and that second-order merge features provide an account of this effect.

The empirical core of this paper is relativization in Moksha Mordvin. This language has three main relativization strategies: regular externally-headed relative clauses, correlatives, and relative clauses with inverse case attraction (ICA). The latter is a rare relativization strategy that patterns with externally-headed relative clauses with respect to a number of properties, but is peculiar in that the head noun shows case assigned inside the relative CP (Bianchi 1999, 2000, Kholodilova 2013, Deal 2016, Abramovitz 2021). In this paper, I will focus on the position of the relative clause and show the three types of relative clauses in Moksha differ in placement of the relative CP with respect to the main clause material. In particular, regular externally-headed relative clauses have no positional restrictions, while both correlatives and relatives with ICA are obligatorily positioned on the left periphery. I will argue that despite the common placement on the left edge, relatives with ICA and correlatives differ in that correlatives are base generated on the left, while relatives with ICA move to this position. The evidence comes from the presence of the correlate, syntactic locality, binding, and coordination.

While movement of relatives with ICA to the left is obligatory, there is notably no clear trigger for this movement that is shared between all instances of relatives with ICA. I would like to suggest that relatives with ICA instantiate the phenomenon that I will call the forced ex-situ effect; see the sample derivation in (3). This is the type of syntactic derivation where some constituent, [X YP] in the example

below, can be created at an intermediate stage of the derivation, but cannot persist until the derivation terminates and must be dismantled before this.

(3) a. Intermediate: [X YP] – OK
b. Final: YP [X __] – OK
c. Final: [X YP] – *

I will propose an account of forced ex-situ effects that is based on the second order merge features. In nutshell, at the point of selection, second order features ensure that the selected syntactic object possesses a feature that triggers its further displacement. I will then show that the pattern is not restricted to relative clauses, but under closer examination is observed for various phenomena cross-linguistically; see German split topicalization (see Ott 2012, 2015), relative pronouns (Aoun & Li 2003, Heck 2005), resumptive pronouns under the Big-DP approach (Boeckx 2003), and wager-class verbs (Postal 1974, Kayne 1984) among others.

I will proceed as follows. In section 2, I will focus on the relative clauses in Moksha, present arguments for obligatorily movement of relatives with ICA and explore possible motivation for this movement. In section 3, I will introduce the concept of the second-order merge features and present the analysis of forced ex-situ effects. In section 4, I will introduce other cases of forced ex-situ effect and show how the analysis accounts for them.

2 Data

2.1 Preliminaries

The empirical part of this paper is based on Moksha. It is a Uralic, Finno-Ugric language. Together with Erzya, it builds a group of Mordvin languages. The language is spoken in the Republic of Mordovia, Russia. Moksha data presented here were mainly collected during my field trips to villages Lesnoe Cibaevo and Lesnoe Ardashevo in 2013-2019. These villages are in the area of central Moksha dialect that is the basis for the Standard Moksha language (Feoktistov 1990).

Moksha has accusative alignment and relatively free word order. The language is characterized by rich nominal morphology, including suffixal definiteness, possessivity and more than 15 case forms. It also has differential object marking and object agreement.

2.2 Three types of relative clauses

Moksha has three main types of finite relative clauses. Regular externally-headed relative clauses represent the first type; see (4). The finite relative clause follows the external head and contains a case-marked relative pronoun.

(4) Mon kurək nʲɛj-sa jalga-zʲə-nʲ [kona-nʲdʲi
I soon see-NPST.3SG.O.1SG.S friend-1SG.POSS.SG-GEN which-DAT
tʲaš-nʲə-nʲ].
write-FREQ-PST.1SG
'I will soon see my friend to whom I have been writing.'

The second type of relative clauses are correlatives; see (5). In Moksha, correlatives are internally-headed: The head noun is inside the relative CP, it follows the unmarked relative pronoun. Correlatives are cross-linguistically characterized by the position of the relative CP on the left and the presence of a correlate in the main clause (see Srivastav 1991, Dayal 1996, Lipták 2009, Lin 2020). In (5), the correlative clause precedes the main clause and the main clause contains a personal pronoun in the corresponding position.

(5) [Kona jalga-zʲə-nʲdʲi tʲaš-nʲə-nʲ] mon
which friend-1SG.POSS.SG-DAT write-FREQ-PST.1SG I
nʲɛj-sa son'.
see-NPST.3SG.O.1SG.S PRON.3SG.GEN
'I will soon see my friend to whom I have been writing.

The third type of relative clauses in Moksha constitute relatives with ICA. These relatives differ from externally-headed relative clauses in that the head noun is marked for case assigned inside the relative clause instead of the case expected according to its position in the main clause. In (6), the head of the relative clause

is marked for dative that is assigned to the gap position in the relative CP. This case also appears on the relative pronoun.

(6) ICA: GEN is external case, DAT is internal case

Jalga-zʲə-**nʲdʲi** [kona-nʲdʲi tʲaš-nʲə-nʲ] mon
friend-1SG.POSS.SG-DAT which-DAT write-FREQ-PST.1SG I
nʲɛj-sa kurək.
see-NPST.3SG.O.1SG.S soon

'I will soon see my friend to whom I have been writing.'

The head noun in this example occupies the position of the direct object in the main clause. Example (7) repeats the main clause from (6) and shows that genitive is assigned to noun phrases in this position. Genitive along with the unmarked form is the standard marking for direct objects in Moksha.[1]

(7) Mon nʲɛj-sa kurək jalga-zʲə-**n**ʲ.
I see-NPST.3SG.O.1SG.S soon friend-1SG.POSS.SG-GEN
'I will soon see my friend.'

Until recently ICA was attested only in a few extinct Indo-European languages such as Ancient Greek (Grimm 2005, 78-92), Latin (Touratier 1980, 147-211), Hittite, Old Persian, Oscan, Umbrian (Hahn 1964), and Old English (Harbert 1983). Lately relatives with ICA were discovered in a number of currently existing languages: Ingrian Finnish (Kholodilova 2013), Beserman Udmurt (Belyaev 2012, Kholodilova & Privizentseva 2015), Nez Perce (Deal 2016), non-standard Icelandic (Wood et al. 2017), and Koryak (Abramovitz 2021). This allowed to study relatives with ICA in detail and develop various approaches to their syntax.

Internal syntax of relatives with ICA will become relevant later in this paper, but for now the empirical focus lies in the external syntax of these relative clauses, their placement with respect to the main clause material. Nevertheless, to facilitate the following discussion, I will now briefly preview the main conclusions on the structure of relatives with ICA; see section 2.6.3 below for the details. In nutshell, relatives clauses with ICA are a subtype of externally-headed relatives and the unusual case on the head noun is due to the raising derivation (Kayne 1994, Bianchi

1999, Donati & Cecchetto 2011, Sportiche 2017): The head of the relative clause is first merged inside the relative CP, gets case there, and then moves to its final position (see Deal 2016 for the same conclusion on Nez Perce).

2.3 Positional properties

The three types of Moksha relative clauses introduced in the previous section differ in the position of the relative clause. As shown in example (4) above (repeated here as (8)) regular externally-headed relative clauses can occupy an argument position and follow the predicate of the main clause.

(8) Mon soda-sa [s'ora-t' [kona-n'd'i Kat'ɛ
I know-NPST.3SG.O.1SG.S boy-DEF.SG.GEN which-DAT Katja
maks-s' kn'iga]] .
give-PST.3[SG] book
'I know the boy whom Katja gave a book.'

The state of affairs is different for both correlatives and relatives with ICA. Placement at the left periphery is one of the defining properties of correlative clauses and the requirement also applies to correlatives in Moksha. Examples in (9) constitute a minimal pair and show that the correlative clause cannot be embedded in the main clause.

(9) a. [Kona s'ora-n'ɛ-t'i Kat'ɛ maks-s' kn'iga] mon
which boy-DIM-DEF.SG.DAT Katja give-PST.3[SG] book I
soda-sa.
know-NPST.3SG.O.1SG.S

b.*Mon soda-sa [kona s'ora-n'ɛ-t'i Kat'ɛ
I know-NPST.3SG.O.1SG.S which boy-DIM-DEF.SG.DAT Katja
maks-s' kn'iga].
give-PST.3[SG] book
'I know the boy whom Katja gave a book.'

A similar restriction applies to relatives with ICA. Data in (10) show that relatives with ICA are grammatical only at the left edge.

(10) ICA: GEN is external case, DAT is internal case

a. [S'ora-t'i [kona-n'd'i Kat'ɛ maks-s' kn'iga]] mon
boy-DEF.SG.DAT which-DAT Katja give-PST.3[SG] book I
soda-sa.
know-NPST.3SG.O.1SG.S

b.*Mon soda-sa [s'ora-t'i [kona-n'd'i Kat'ɛ
I know-NPST.3SG.O.1SG.S boy-DEF.SG.DAT which-DAT Katja
maks-s' kn'iga]] .
give-PST.3[SG] book
'I know the boy whom Katja gave a book.'

Despite a common placement at the left edge, there are positional differences between correlatives and relatives with ICA. Example (11)-(12) shows that the position after a topicalized argument of the main clause is not fully excluded for relatives with ICA, but is ungrammatical for correlatives.

(11) ICA: GEN is external case, DAT is internal case
?Al'ɛ-z'ə [s'ora-t'i [kona-n'd'i Kat'ɛ maks-s'
father-1SG.POSS.SG boy-DEF.SG.DAT which-DAT Katja give-PST.3[SG]
kn'iga]] soda-si.
book know-NPST.3SG.O.3SG.S
'My father knows the boy whom Katja gave a book.'

(12) *Al'ɛ-z'ə [kona s'ora-t'i Kat'ɛ maks-s' kn'iga]
father-1SG.POSS.SG which boy-DEF.SG.DAT Katja give-PST.3[SG] book
soda-si.
know-NPST.3SG.O.3SG.S
'My father knows the boy whom Katja gave a book.'

This difference suggests that the nature of placement at the left might differ for relatives with ICA and correlatives. I will explore this in the next section.

2.4 Movement vs. base generation

In this section, I will consider the properties of left-peripheral relatives and show that correlatives in Moksha are first merged on the left, while relatives with ICA originate in regular DP positions and move to the left. I will provide five arguments for this conclusion.

2.4.1 Correlate

The first argument comes from the material occupying the main clause position to which the relative CP corresponds. As pointed above, correlative clauses are characterized by the presence of the correlative pronoun, the so-called demonstrative requirement (Srivastav 1991, Dayal 1996, Lipták 2009, and Lin 2020). In Moksha, the main clause may contain a demonstrative pronoun, but its presence is not always obligatory. As shown in (13)-(14), the pronoun is optional in the subject position and if the verb shows object agreement in the direct object position as well.

(13) [Kona loman'-t' šav-əz' hul'iga-t'n'ə] (s'ɛ)
which person-DEF.SG.GEN beat-PST.3.O.3PL.S hooligan-DEF.PL that
aš'č'-i bal'n'ica-sə.
be-NPST.3[SG] hospital-IN
'The person, whom hooligans have beaten, is in the hospital.'

(14) [Kona karopka-t'i mon put-in'ə fətəgrafijə-t'n'ə-n']
which box-DEF.SG.DAT I[NOM] put-PST.3.O.1SG.S photo-DEF.PL-GEN
min' jorda-s'k (s'ɛ-n').
we[NOM] throw.away-PST.3.O.1PL.S that-GEN
'We threw away the box in which I put the photos.'

The correlate is required in oblique positions. For instance, in (15) the correlative clause corresponds to the argument of the verb 'fear' that is marked by the ablative case or by the postposition *ezdə* 'in.ABL'. The absence of the demonstrative pronoun leads to the ungrammaticality in this case.

(15) [Kona pin'ə-t' mon vas'ft-in'ə] *(s'ɛ-n' ezdə)
which dog-DEF.SG.GEN I meet-PST.3.O.1SG.S that-GEN in.ABL
pel'-an.
fear-NPST.1SG
'I am afraid of the dog that I met.'

I assume that absence of the correlate in the subject and the direct object positions follows from the pro-drop independently available in the language. Example (16) show that Moksha allows for pro-drop in the subject position and in the object

position if the verb has object agreement.

(16) N'ɛj-an vir'.
see-NPST.1SG forest
'I see a forest.'

(17) Mon n'ɛj-sa.
I see-NPST.3SG.O.3SG.S
'I see that.'

Relatives with ICA do not require the demonstrative pronoun independently of the syntactic position in the main clause:

(18) ICA: NOM is external case, GEN is internal case
Loman'-t' [kona šav-əz' hul'iga-t'n'ə]
person-DEF.SG.GEN which beat-PST.3.O.3PL.S hooligan-DEF.PL
aš'č'-i bal'n'ica-sə.
be-NPST.3[SG] hospital-IN
'The person, whom hooligans have beaten, is in the hospital.'

(19) ICA: GEN is external case, ABL is internal case
[**Pin'ə-t'** [kona-n' mon vas'ft-in'ə]] pel'-an.
dog-DEF.SG.GEN which-GEN I meet-PST.3.O.1SG.S fear-NPST.1SG
'I am afraid of the dog that I met.'

Example (19) shows that the pronoun is not required for relatives with ICA in the oblique position and thereby contrasts with the correlative in (15) where the pronoun is obligatory. The data can be interpreted as follows: Correlatives show that oblique positions in Moksha if present must be filled. The absence of a correlate for relatives with ICA then indicates that the position is filled by the relative clause that moves to the left periphery at a later stage.

2.4.2 Islands

The next diagnostic distinguishing relatives with ICA from correlatives comes from the locality restrictions on movement: Relatives with ICA being positioned on the left edge cannot refer to a position within an island. This contrasts with correlative

clauses that are not sensitive to islands. Since relatives with ICA are subject to restrictions that generally apply to movement dependencies, their position on the left is derived, while correlatives are base-generated there.

I will consider two types of structures opaque for movement: adjunct clauses and complex noun phrase structures. I will start with adjunct islands. Example (20) shows a fully grammatical adjunct clause in Moksha and the subsequent example (21) illustrates that extraction of the subject out of the adjunct is blocked.

(20) Mon ulʲ-an kənʲɛrʲdʲ-f [kədə katə-sʲ karma-j
I be-NPST.1SG happy-PTCP.RES if cat-DEF.SG become-NPST.3[SG]
kuncʲ-əmə šejəɾ̥ʲ-tʲ].
catch-FREQ.INF mouse-PL
'I will be happy if the cat starts catching mice.'

(21) * [Katə-sʲ] mon ulʲ-an kənʲɛrʲdʲ-f [kədə ___
cat-DEF.SG I be-NPST.1SG happy-PTCP.RES if
karma-j kuncʲ-əmə šejəɾ̥ʲ-tʲ].
become-NPST.3[SG] catch-FREQ.INF mouse-PL
'I will be happy if the cat starts catching mice.'

Example (22) shows that relatives with ICA cannot refer to a position embedded within the adjunct island.

(22) ICA: NOM is external case, GEN is internal case
* [Katə-**t**ʲ kona-nʲ tʲejə-n kazʲ-əz]
cat-DEF.SG.GEN which-GEN PRON.DAT-1SG.POSS gift-PST.3.O.3PL.S
mon ulʲ-an kənʲɛrʲdʲ-f [kədə ___ karma-j
I be-NPST.1SG happy-PTCP.RES if become-NPST.3[SG]
kuncʲ-əmə šejəɾ̥ʲ-tʲ].
catch-FREQ.INF mouse-PL
'I will be happy if the cat that they gifted to me starts catching mice.'

Correlative clauses differ from relatives with ICA and can correspond to a position within the adjunct island:

(23) [Kona katə-tʲ tʲejə-n kazʲ-əz] mon
which cat-DEF.SG.GEN PRON.DAT-1SG.POSS gift-PST.3.O.3PL.S I
ulʲ-an kənʲɛrʲdʲ-f [kədə ___ karma-j
be-NPST.1SG happy-PTCP.RES if become-NPST.3[SG]

kunc'-əmə šejəɾ̥'-t'].
catch-FREQ.INF mouse-PL
'I will be happy if the cat that was gifted to me starts catching mice.'

The next island structure is the complex noun phrase island represented by a regular externally-headed relative clause. Example (24) sets up the base line and (25) illustrates that extraction of a DP out of the relative clause is blocked.

(24) Mon soda-sa s'ɛ loman'-t' [kona
I know-NPST.3SG.O.1SG.S that person-DEF.SG.GEN which
pan'-əz'ə pin'ə-t'].
kick.out-PST.3SG.O.3SG.S dog-DEF.SG.GEN
'I know that person who kicked out the dog.'

(25) * [Pin'ə-t'] mon soda-sa s'ɛ loman'-t'
dog-DEF.SG.GEN I know-NPST.3SG.O.1SG.S that person-DEF.SG.GEN
[kona pan'-əz'ə ___].
which kick.out-PST.3SG.O.3SG.S
'I know that person who kicked out the dog.'

Relatives with ICA show the same behavior as simple DPs and cannot refer to a position within another relative clause.

(26) ICA: GEN is external case, DAT is internal case
* [Pin'ə-**t'i** kona-n'd'i maks-in'ə jaɾ̥ca-ma-t']
dog-DEF.SG.DAT which-DAT give-PST.3.O.1SG.S eat-NZR-DEF.SG.GEN
mon soda-sa s'ɛ loman'-t' [kona
I know-NPST.3SG.O.1SG.S that person-DEF.SG.GEN which
pan'-əz'ə ___].
kick.out-PST.3SG.O.3SG.S
'I know that person who kicked out the dog that I gave food.'

Correlatives are not subject to this locality restriction and being on the left edge can refer to a position within the complex noun phrase island:

(27) [Kona pin'ə-t'i maks-in'ə jaɾ̥ca-ma-t'] mon
which dog-DEF.SG.DAT give-PST.3.O.1SG.S eat-NZR-DEF.SG.GEN I
soda-sa s'ɛ loman'-t' [kona
know-NPST.3SG.O.1SG.S that person-DEF.SG.GEN which

panˈ-əzˈə ___].
kick.out-PST.3SG.O.3SG.S
'I know that person who kicked out the dog that I gave food.'

Thus, both adjunct and relative clause islands show that relatives with ICA are sensitive to locality restrictions on movement and correlatives are not.

2.4.3 Variable binding

The next diagnostic is based pronominal binding and goes as follows: If a variable embedded in the left-peripheral relative clause can be bound by a quantified noun phrase in the main clause, the relative clause must have been in the position c-commanded by the main clause material earlier in the derivation and the position at the left is derived. If, on the other hand, bound interpretation is not possible, the relative clause at the left was never embedded into the main clause.

Data in (28) show that the pronoun embedded in the relative with ICA can be bound by a quantified noun phrase in the main clause despite the position of the relative clause on the left edge.

(28) ICA: GEN is external case, DAT is internal case
[Pinˈə-tˈi kona-nˈdˈi **son$_i$** maks-əzˈə
dog-DEF.SG.DAT which-DAT PRON.3SG give-PST.3SG.O.3SG.S
jaɽ̥cambɛlˈ-tˈ] **ɛrˈ** **sˈora-nˈɛ-sˈ$_i$** mɛlˈaft-əzˈə.
food-DEF.SG.GEN every boy-DIM-DEF.SG remember-PST.3SG.O.3SG.S
'Every boy$_i$ remembered the dog that he$_i$ gave food.'

This contrasts with the data on correlatives where bound interpretation is illicit.

(29) [Kona pinˈə-tˈi **son$_{j/*i}$** maks-əzˈə
which dog-DEF.SG.DAT PRON.3SG give-PST.3SG.O.3SG.S
jaɽ̥cambɛlˈ-tˈ] **ɛrˈ** **sˈora-nˈɛ-sˈ$_i$** mɛlˈaft-əzˈə.
food-DEF.SG.GEN every boy-DIM-DEF.SG remember-PST.3SG.O.3SG.S
'Every boy$_i$ remembered the dog that he$_{j/*i}$ gave food.'

Thus, variable binding contributes to by now familiar pattern: Relatives with ICA undergo movement, while correlatives are base-generated at the left.

2.4.4 Anaphor binding

The next diagnostic uses binding of anaphors. In (30), the anaphor is contained in the head of the relative clause with ICA and it may be bound by the subject of main clause despite the absence of c-command between them in the final structure.

(30) ICA: GEN is external case, DAT is internal case

[**Es'$_i$** mašina-**ncti** kona-n'd'i put-f lama jarmak]
self car-3SG.POSS.SG.DAT which-DAT put-PTCP.RES many money
Vas'ɛ$_i$ dagə pet'-əz'ə.
Vasja again repair-PST.3SG.O.3SG.S

'Vasja$_i$ again repaired his$_i$ car that a lot of money was invested into.'

The anaphor is bound in a regular fashion under c-command if the relative CP originates in the argument position of the main clause and later moves to the left. The diagnostic is not applicable to correlatives, because the head of the correlative clause is internal to the relative CP and anaphor binding in Moksha is clause-bound:

(31) Maša$_j$ soda-si što Van'ɛ$_i$ es'$_{i/*j}$
Masha know-NPST.3SG.O.3SG.S that Vanja self
var'aga-nc mu-z'ə.
mitten-3SG.POSS.SG.GEN find-PST.3SG.O.SG.S
'Masha knows that Vanja$_i$ found his$_i$ mitten.'

2.4.5 Coordination

The final argument comes from coordination. Relatives with ICA can be coordinated with a noun phrase that has regular case assigned in the main clause. This demonstrates that the whole coordinated phrase was in the argument position of the main clause where the case is typically assigned.

(32) ICA: GEN is external case, DAT is internal case

a. [Osal pin'ə-**t'i** kona-n'd'i ton maks-at jaṛca-ma] i
skinny dog-DEF.SG.DAT which-DAT you give-NPST.2SG eat-NZR and
[ečkə **katə-t'**] mon soda-sajn'ə.
thick cat-DEF.SG.GEN I know-NPST.3PL.O.1SG.S

'I know the skinny dog that you give food and the fat cat.'

b. [Ečkə **katə-t'**] i [osal pinˈə-**t'i** kona-nˈdˈi ton
thick cat-DEF.SG.GEN and skinny dog-DEF.SG.DAT which-DAT you
maks-at jaɾ̥ca-ma] mon soda-sajnˈə.
give-NPST.2SG eat-NZR I know-NPST.3PL.O.1SG.S
'I know the fat cat and the skinny dog that you give food.'

The two examples above differ in the order of conjuncts and show that this has no impact on grammaticality. Further, the verb in the main clause shows plural agreement with the coordinated phrase in both examples. This excludes the analysis with clause coordination followed by ellipsis as schematized in (33).

(33) [$_{CP}$ the fat cat ~~I know~~] and [$_{CP}$ the skinny dog that I gave food I know]

Thus, the data on coordination support the movement analysis for relatives with ICA. The diagnostic is not applicable to correlatives that being CPs are not expected to allow coordination with a noun phrase in the first place.

2.5 Summary

The data are summarized in table (34). Presence of the correlative pronoun, locality restrictions, binding of personal pronouns and reflexives, as well as coordination demonstrate that relatives with ICA are base generated in main clause and are subsequently moved to the the left periphery. Three of these diagnostics are applicable to correlatives. They demonstrate that correlatives behave differently and argue for their base generation at the left.

(34) Properties of left-peripheral relatives

	ICA	Correlatives
1. No correlate	OK	*
2. Island violations	*	OK
3. Variable binding	OK	*
4. Anaphor binding	OK	
5. Coordination	OK	

Overall, this study confirms that positions on the left edge may be different in nature in that they can be derived by movement or by base generation (see Cinque 1977, Vat 1981, López 2016, Fernández-Sánchez & Ott 2020). The derivations of relatives with ICA and correlatives are sketched in (35) and (36) respectively.

(35) Relative clauses with ICA

a. [$_{\text{MC}}$ ... predicate ... [head [$_{\text{CP}}$ ...]] ...]

b. [[head [$_{\text{CP}}$ ...]] [$_{\text{MC}}$ ... predicate ... ___ ...]

(36) Correlative clauses

[$_{\text{CP}}$ ... correlative clause ...] [$_{\text{MC}}$ ... correlate ...]

Before turning to the motivation for movement of relatives with ICA to the left, I would like to address cross-linguistic variation in placement of relative clauses with ICA and correlatives. Position at the left edge is one of the defining characteristics of correlatives and while it is typically viewed as a base position (Srivastav 1991), for some languages it was argued that correlatives are moved to the left after all (see Bhatt 2003, Foley 2013, Bhatt & Nash 2022). Similarly, research on relatives with ICA in Ingrian Finnish (Kholodilova 2013), Beserman Udmurt (Kholodilova & Privizentseva 2015), and Koryak (Abramovitz 2021) converges with the Moksha data and argues for movement, relatives with ICA in Nez Perce were shown to be insensitive to islands and therefore base generated on the left periphery (see Deal 2016). Thus, while correlatives are base generated at the edge and relatives with ICA move there in Moksha, for both these phenomena the opposite empirical picture was argued to be correct in other languages. On the one hand, this state of affairs invites to revisit evidence from other languages, but this task is clearly beyond the scope of this paper. The alternative option (that I tentatively assume here) is that this is yet another case where superficially similar phenomena in different languages have different properties under closer examination; cf., for instance, cross-linguistic variation in passive structures (see Legate 2021) or in pseudo-noun incorporation phenomena (see Driemel 2020).

2.6 Motivation for movement

The goal of this section is to explore the motivation for left displacement of relatives with ICA. Since such placement is often associated with information structural properties, I will start this section by discussing possible information structural interpretation of relatives with ICA. I will show that there is no clear topic or focus meaning obligatorily associated with ICA. I then turn to other properties of relatives with ICA that might be responsible for their movement. I consider external syntax and show that these relatives have external syntax of DPs, not CPs as correlatives, i.e., their category does not preclude placement in a regular argument position and cannot motivate movement. Finally, I discuss internal syntax of relatives with ICA and show that they are derived by raising. This by itself does not motivate movement, but internal case marking on the head noun plays an indirect role in movement of relatives with ICA to the left.

2.6.1 Information-structural properties

Data in (37) and (38) show that relatives with ICA can be part of the focus. In (37), the DP that includes the relative clause constitutes narrow focus, it answers the wh-question. Example (38) illustrates broad focus.

(37) a. Context: Who is the food for?

b. ICA: DAT is external case, GEN is internal case
Pinˈə-**t**ˈ [kona-nˈ Petˈɛ rama-zˈə] mon
dog-DEF.SG.GEN which-GEN Petja buy-PST.3SG.O.3SG.S I
maks-an jar̥ca-ma.
give-NPST.1SG eat-NZR
'I am giving food to the dog that Petja bought.'

(38) a. Context: What happened?

b. ICA: GEN is external case, NOM is internal case
Alʲɛ-zʲə-**nʲ** [kona-nʲ šav-əzʲ
father-1SG.POSS.SG-GEN which-GEN beat-PST.3.O.3PL.S
hulʲiga-tʲnʲə] aščʲ-i balʲnʲica-sə.
hooligan-DEF.PL be-NPST.3[SG] hospital-IN
'My father, whom hooligans have beaten, is in the hospital.'

Relatives with ICA do not have to be focal, but can be topical as well:

(39) a. Context: Are you scared of this dog? Yes, ...

b. ICA: ABL is external case, DAT is internal case
Tʲɛ pinʲə-**tʲi** [kona-nʲdʲi Petʲa maksʲ-i jaŗca-ma] mon
this dog-DEF.SG.GEN which-GEN Petja give-PST.3[SG] eat-NZR I
pelʲ-an.
fear-NPST.1SG
'I am scared of this dog that Petja gave food.'

As there is no clear interpretation associated with relatives with ICA, movement to the left cannot be driven by information-structural reasons.

2.6.2 RC-external syntax

In this section, I will consider external syntax of relatives with ICA and argue that they are DPs. This means that their syntactic category is fully compatible with the placement in the main clause and cannot motivate movement.

First, as shown in (40) a predicate in the main clause agrees in ϕ-features with the head of the relative clause as it does with regular DPs.

(40) ICA: NOM is external case, GEN is internal case

Uča-**tˈnˈə-n**ˈ [kona-nˈ alˈɛ-zˈə
sheep-DEF.PL-GEN which-GEN father-1SG.POSS.SG
pečk-əzˈənˈ] aščˇ-ijˇ-tˈ kut-tˈ ingəl-ə.
butcher-PST.3PL.O.3SG.S be-NPST.3-PL house-DEF.SG.GEN before-LOC

'The sheep that my father butchered were in front of the house.'

Second, as shown in section 2.4.5, relatives with ICA can be coordinated with a DP; see (41). Assuming that only constituents of the same category allow coordination, this suggests that relatives with ICA are DPs.

(41) ICA: GEN is external case, DAT is internal case

[Osal pinˈə-**tˈi** kona-nˈdˈi ton maks-at jaṛca-ma] i
skinny dog-DEF.SG.DAT which-DAT you give-NPST.2SG eat-NZR and
[ečkə **katə-t**ˈ] mon soda-sajnˈə.
thick cat-DEF.SG.GEN I know-NPST.3PL.O.1SG.S

'I know the skinny dog that you give food and the fat cat.'

Third, the head noun can bind anaphors in the main clause. Assuming that anaphor binding requires c-command, this suggests that relatives with ICA have (at least) a DP projection on top of the CP. This DP hosts the index feature required for binding.

(42) ICA: NOM is external case, GEN is internal case

Petˈɛ-nˈ$_{i}$ [kona-nˈ tona-ft-inˈə ard-əma]
Petja-GEN which-GEN teach-PST.3.O.1SG.S drive-NZR
mi-zˈə **esˈ$_{i}$** mašinə-nc.
sell-PST.3SG.O.3SG.S self car-3SG.POSS.SG.GEN

'Petja$_{i}$ whom I taught to drive sold his$_{i}$ car.'

Fourth, relatives with ICA differ from correlatives and internally-headed relatives in general in the set of possible interpretations. Correlatives are maximalizing (Grosu 2002, Lipták 2009, Brasoveanu 2012, Lin 2020); internally-headed relatives are maximalizing or restrictive, but not appositive (Lehmann 1984, 278, De Vries 2002, Grosu 2012). As shown in (43), relatives with ICA can have the appositive interpretation. It is ensured by a parenthetical *meždu pročim* 'by the way'.

(43) ICA: NOM is external case, GEN is internal case

Rovnaj kaftə **prˈistupnˈik-nˈə-nˈ** [kona-tˈnˈə-nˈ meždu pročim
straight two criminal-DEF.PL-GEN which-DEF.PL-GEN between others
kunda-zˈənˈ] Petˈɛ vorˈgədˈ-kšnˈə-sˈ-tˈ.
catch-PST.3PL.O.3SG.S Petja run.away-AVR-PST.3-PL

'Exactly two criminals, who Petja, by the way, caught, were running away.'

Under the appositive interpretation, the nominal head fully determines the reference and the relative CP supplies additional information. Such interpretation is naturally derived if the head of the relative clause is external to the relative CP. It thus determines the type of the whole constituent as DP.

Example (44) further shows that the restrictive interpretation is possible for relatives with ICA. This confirms that at least D-level elements are outside of the relative CP.

(44) ICA: NOM is external case, GEN is internal case

Koj kona **prˈistupnˈik-nˈə-nˈ** [kona-tˈnˈə-nˈ
INDEF which criminal-DEF.PL-GEN which-DEF.PL-GEN
kunda-zˈənˈ] Petˈɛ vorˈgədˈ-kšnˈə-sˈ-tˈ.
catch-PST.3PL.O.3SG.S Petja run.away-AVR-PST.3-PL

'Some criminals that Petja caught were running away.'

Finally, relatives with ICA as well as regular externally-headed relative clauses allow stacking of multiple relative CPs under one nominal head as shown in (45). This yet again sets apart relative clauses with ICA and correlatives. Correlative clauses typically do not allow stacking, see also example (46) from Moksha.

(45) ICA: NOM is external case, GEN is internal case

Pɛrˈɛkɛ-tˈ [**kona-nˈ** pidˈ-əzˈə
pie-DEF.SG.GEN which-GEN cook-PST.3SG.O.3SG.S
sasˈədə-zˈə] [**kona-nˈ** minˈ srazu seva-sˈk]
neighbor-1SG.POSS.SG which-GEN we immediately eat-PST.3.O.1PL.S
ulˈ-sˈ kapsta-nˈ.
be-PST.3[SG] cabbage-GEN

'The pie that my neighbor made that we immediately ate was with cabbage.'

(46) *[Kona pɛrˈɛkɛ-tˈ pidˈ-əzˈə sasˈəda-zˈə]
which pie-DEF.SG.GEN cook-PST.3SG.O.3SG.S neighbor-1SG.POSS.SG
[kona (pɛrˈɛkɛ-tˈ) minˈ srazu seva-sˈk]
which pie-DEF.SG.GEN we[NOM] immediately eat-PST.3.O.1PL.S
son ulˈ-sˈ kapsta-nˈ.
PRON.3SG be-PST.3[SG] cabbage-GEN
'The pie that my neighbor made that we immediately ate was with cabbage.'

The accounts of this ban build on the maximalizing semantics (see Grosu 2002, Bhatt & Pancheva 2006), so that the possibility of stacking relatives with ICA confirms that the set of interpretations for relatives with ICA is not restricted as for correlatives. In addition, from a purely syntactic viewpoint, stacking of two CP under one nominal head suggests that this nominal head is external to the relative CP, at least under the simplest approach to the data (see though Abramovitz (2021) for an alternative).

To sum up, in this section I have discussed external syntax of relatives with ICA and argued that they behave as regular DPs. The category is therefore not responsible for movement to the left. In the next section I will turn to relative CP internal syntax.

2.6.3 RC-internal structure

Relative clauses with ICA are part of the discussion on the correct formal analysis of relative clauses. Bianchi (1999, 2000) introduces relatives with case attraction in a number of extinct European languages (Latin, Ancient Greek, Old English, and Old High German) as an argument for the raising derivation (see Vergnaud 1974, Kayne 1994, Sauerland 1998, Bhatt 2002, De Vries 2002): The head shows case assigned inside the relative CP, consequently it occupied the case position inside the relative CP, and then was raised. Subsequent research has however shown that internal case can be also derived under other approaches to the relative clause structure. Under the matching derivation, it is simply the internal head that is deleted instead of the external one (see Cinque 2015, 2020, Wood et al. 2017, and to some extent Abramovitz 2021). Under the head-external approach, the head receives internal case via agreement with the relative pronoun (see Harbert 1983,

Gračanin-Yuksek 2013, and also Bader & Meng 1999, Bader & Bayer 2006, and Czypionka et al. 2018).

Applying standard connectivity diagnostics, I will show that relatives with ICA are derived by raising, i.e., the head of the relative clause is first merged in the gap position inside the relative CP and then moves to its position in the main clause. The head noun gets case in the base position in the relative CP and moves to the main clause already equipped with a case feature.

The first argument comes from idioms and is based on the assumption that parts of an idiom must be base generated as a constituent (Bach 1974, Chomsky 1980, 149-153, and McCawley 1998, 57). If so, the ability of the head noun to build an idiom with a material from the relative CP and/or with a material from the main clause shows whether the head noun is base generated in the relative or in the main clause. I use idiom *panˈžəms potmə* that is translated as 'to open up / to tell everything' and has literal meaning 'to open guts/insides'. Example (47) shows that if the head of the relative clause forms this idiom with the CP-internal material, the head must be marked for the case assigned in the relative CP.

(47) ICA: NOM is external case, GEN is internal case

Potmə-nc/*c	[kona-nˈ	Vasˈɛ	**panˈž-əzˈə**		
gut-3SG.POSS.SG.GEN/*NOM	which-GEN	Vasja	open-PST.3SG.O.3SG.S		
ava-ncti	___]	kunarə	af	maks-i	pokoj.
wife-3SG.POSS.SG.DAT		long.ago	NEG	give-PST.3[SG]	rest

'Everything that Vasja revealed to his wife worried him for a long time.'

The second diagnostic comes from anaphor binding. Example (48) shows that the anaphor in the head noun can be bound inside the relative CP only if the head has internal case. The possibility of logophoric binding is here excluded by the inanimate antecedent (see Charnavel & Sportiche 2016, Charnavel 2019, and Charnavel & Bryant 2022).

(48) ICA: NOM is external case, DAT is internal case

Es'$_i$ luv-ij-ənzə-n'd'i/*ø [kona-t'n'ə-n'd'i t'ɛ
self read-PTCP.ACT-3SG.POSS.PL-DAT/*NOM which-DEF.PL-DAT this
kn'iga-s'$_i$ maks-i nad'əja-ma ___] uč-i̊j-t' pe.
book-DEF.SG give-NPST.3[SG] hope-NZR wait-NPST.3-PL end

'Its$_i$ readers whom this book$_i$ gave hope are waiting for the continuation.'

The final piece of evidence comes from Condition C. Coreference between the proper name in the head of the relative clause and the personal pronoun in the relative CP is not allowed if the head is marked for internal case:

(49) ICA: NOM is external case, GEN is internal case

Puškin-ən'$_j$ kn'iga-nc [kona-n' **son$_{i/*j}$**
Pushkin-GEN book-3SG.POSS.SG.GEN which-GEN PRON.3SG
t'ɛšt'-əz'ə ___ Pavləfskɛj dača-sə] aščʲ-i
write-PST.3SG.O.3SG.S pavlosk's country.house-IN be-NPST.3[SG]
bibl'iat'eka-sə-nək.
library-IN-1PL.POSS

'Pushkin's book that he wrote in Pavlovsk's country house is in our library.'

To sum up, idioms, anaphor binding, and condition C show that relatives with ICA are generated by raising as shown in (50).

(50) Raising derivation for relatives with internal case

$$[_{DP}\ \underline{\text{head-INT.CASE}}\ [_{CP}\ \text{rel.pron}\ C_{rel}\ \ldots\ \_\_{}_{\text{head-INT.CASE}}\ \ldots\ ]\ ]$$

Relatives with ICA differ from the vast majority of raising relative clauses in that despite the origin inside the relative CP the heads of regular raising relatives show case assigned in the main clause. The fact that heads do not display the case assigned in their base position was viewed as evidence against raising (see Borsley 1997). Relatives with ICA fill this gap and I will present their derivation in more details in section 3.2.

3 Analysis

3.1 Second order selection features

In the first, empirical part of this paper, I have considered relative clauses with ICA in Moksha and the main focus of the discussion was the position of these relative clauses at the left periphery that I have argued results from movement, not base-generation. I have further considered possible triggers for this movement and have shown that there is neither a clear semantic nor syntactic property that underlies this movement. I would like to suggest that obligatorily displacement of relatives with ICA is an instance of what I will call the forced ex-situ effect. This is the type of syntactic derivation under which two syntactic objects form a constituent at an intermediate stage of the derivation, but this constituent cannot persist until the derivation terminates. The phenomenon is schematically illustrated in (51). In this example, the constituent [X YP] is generated, but cannot be part of the resulting structure.[2]

(51) a. Intermediate: [X YP] – OK
b. Final: YP [X __] – OK
c. Final: [X YP] – *

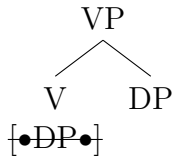
I would like to propose that forced ex-situ effect is best derived in the model of syntax where merge is feature-driven (Chomsky 1995, Adger 2003, Müller 2010, 2017 as well as Stabler 1997). It follows if syntactic selection applies not only for a category, but also for any unsaturated feature of a the selected syntactic object.

Example (52) shows a merge feature selecting only for a category. Recall that throughout this paper merge features are indicated as [•F•] and probe features – as [∗F∗], following the notation introduced by Heck & Müller (2007).

(52) Regular merge feature

V
[•DP•]

(53) Merge

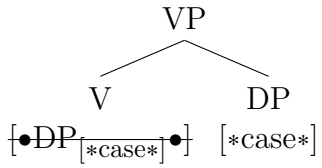


Example (54) demonstrates a merge feature with the second order subfeature. In this case, the verbal head selects for a DP with an unvalued case feature. In (55), the selected DP has an active case probe, so that merge successfully applies. If the DP had no case probe, merge would be impossible.

(54) Second order merge feature

V
[•DP$_{[*case*]}$•]

(55) Merge



The idea of selection applying for properties beyond the category is not unprecedented: For instance, Bruening (2013) suggests that the passive head selects for the voice projection with an unchecked nominal feature and this ensures that the external argument is not merged in the passive derivation. Second order selection is also widely used in Categorial Grammar (see Steedman 2014). The proposal here however differs from the previous work in that second order features that selection applies for are not automatically checked upon merge, but remain active and consequently influence the behavior of the selected phrase in the derivation. In the next section, I will show how second order merge features allow at a very local point of selection to determine later displacement of the selected syntactic object and derive forced ex-situ effects in Moksha relative clauses.

3.2 Derivations

In section 2.6.3, I have argued that relatives with ICA are derived by raising and the head noun receives its case within the relative CP, before movement. The derivation thus includes movement of a case marked noun to yet another case

position. Such movements seem to be rare and very restricted cross-linguistically (cf., for instance, Activity Condition by Chomsky (2001) that renders DPs inert after they have received case).[3] I would like to suggest that this is because verbal (and some clausal) heads typically select not simply for DPs, but for DPs with an active case probe:

(56) $\overset{\text{V}}{[\bullet \text{D}_{[*\text{case}*]} \bullet]}$

As heads of relative clauses with ICA get case inside the relative CP, the requirement in (56) trivially cannot be satisfied. In languages with ICA, it is loosened, so that the nature of the unchecked agreement feature is underspecified:

(57) $\overset{\text{V}}{[\bullet \text{D}_{[*\text{F}*]} \bullet]}$

Feature [∗F∗] in (57) stands for any active agreement probe. Such selection requirement is satisfied if a DP has an unvalued case probe, but also if the case probe is valued and the DP has some other active probe (for instance, [∗wh∗], [∗foc∗], or [∗top∗]). Below I will show that this additional feature that is required to satisfy selection inevitably leads to movement of the DP to the left in Moksha.

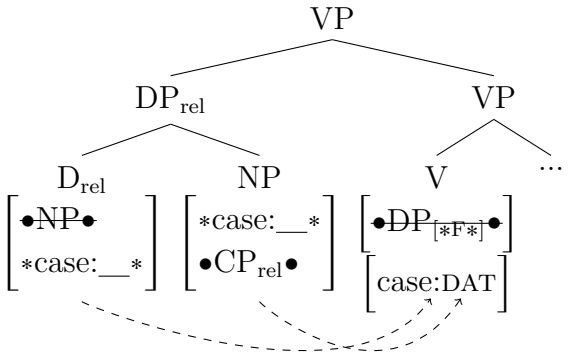
Consider the following derivation. In (59), the head of the relative clause is merged in the relative CP. It builds a constituent with the relative pronoun that occupies D_{rel}. Both the head noun and the relative pronoun receive case in this position, for instance, dative as in example (58).

(58) ICA: GEN is external case, DAT is internal case

Jalga-zʲə-**nʲdʲi** [kona-nʲdʲi tʲaš-nʲə-nʲ] mon
friend-1SG.POSS.SG-DAT which-DAT write-FREQ-PST.1SG I
nʲɛj-sa kurək.
see-NPST.3SG.O.1SG.S soon

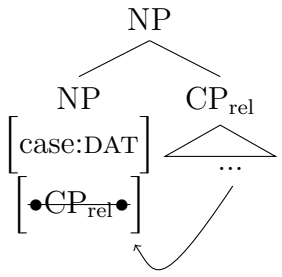
'I will soon see my friend to whom I have been writing.'

(59) Case assignment in the relative CP



The derivation continues and after the relative clause is built, the NP moves to head the relative clause. The landing site and the motivation for this movement remains debated (see Bianchi 1999, Bhatt 2002, Henderson 2007, Donati & Cecchetto 2011, Deal 2016). Here, I assume that the head NP lands outside of the relative CP and projects in its landing site; see (60). This movement is triggered by the merge feature on the noun phrase that probes upwards and finds the relative CP as its goal; cf. Münchhausen features (Fanselow 2003). Since the movement is triggered by the features of the NP, this NP also projects in the landing site following the standard 'the item that selects is the item that projects' rule (Chomsky 1995, Adger 2003, as well as Stabler 1997).

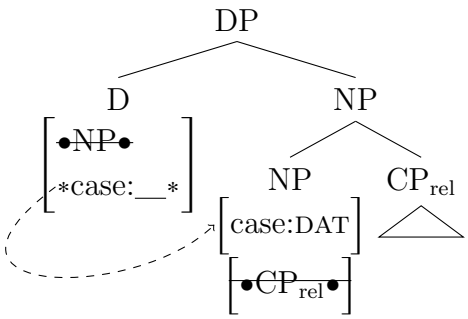
(60) Movement of the head noun



Alternatively, the movement of the head NP may be triggered by a feature on some additional functional head; for instance on a nominal head outside of the relative clause as suggested by Bhatt (2002) and Deal (2016). The head noun then lands in the specifier of this functional projection yielding the following structure: [$_{XP}$ NP X [$_{CP}$ ...]]. Independently of how the movement of the head NP is

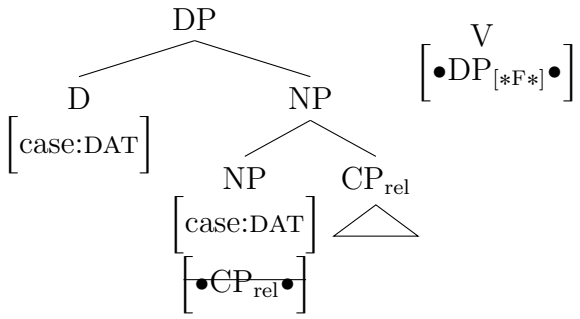
accomplished, the next step of the derivation is the same: The external D head is merged. It has an unvalued case probe that finds the case feature on the NP and copies its value.

(61) External D gets internal case



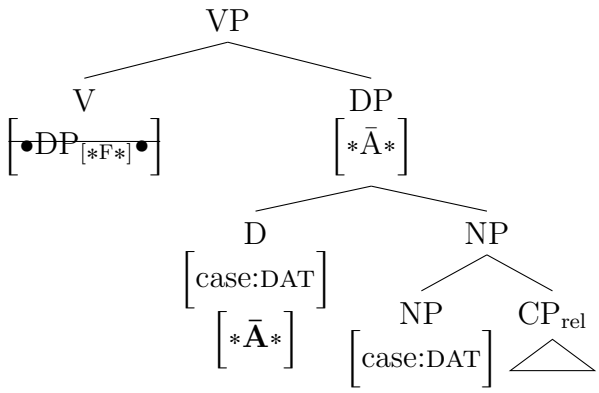
Next, this DP must be selected by a verbal head in the main clause. Following the proposal here, verbal heads select for DPs with an active probe. Typically, case plays the role of this active feature, but on heads of relatives with ICA case is already valued by the case feature from within the relative CP. In result, the DP has no unchecked probes, so that selection in the main clause cannot succeed and the derivation crashes.

(62) Selection in the main clause is impossible



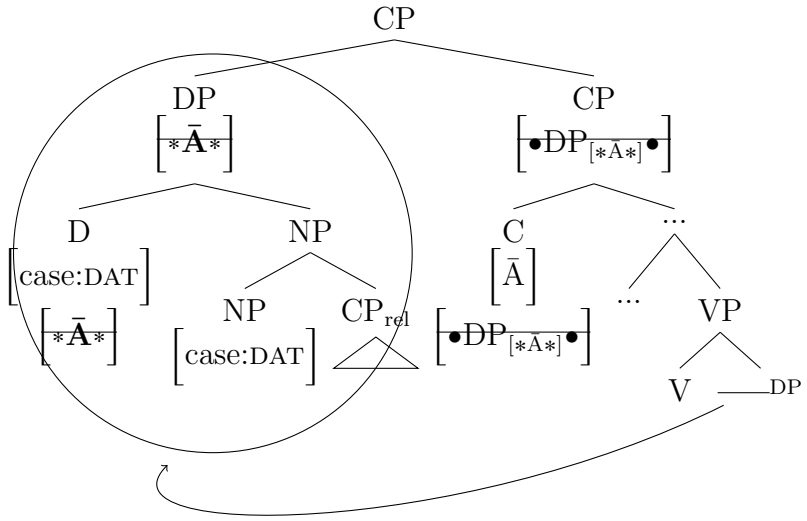
Suppose now that the D head also has some active Ā-feature as in (63). Independently of the exact nature of this probe (it can be [∗wh∗], [∗top∗], or [∗foc∗]), this allows the DP to be selected by further main clause material.

(63) Selection in the main clause



After this, structure building in the main clause continues and once the C head is introduced, it attracts the DP with the [∗Ā∗] probe to its specifier:

(64) Movement to the left



Thus, in the derivation above the active Ā-feature is necessary to allow for the DP with case from within the relative CP to be selected by the main clause material, but afterwards it inevitably leads to movement of the whole DP to the left edge. This derives obligatorily placement of relatives with ICA at the left.

Before the end of this section, one remaining issue must be addressed. I have proposed that for selection by most verbal heads, the DP must have an active feature. The role of this feature is typically played by case, but remains unspecified in languages with ICA. This allows an Ā-probe to enable selection of a DP with a

valued case probe, but also does not restrict the nature of this additional feature to an Ā-feature. The analysis thus leaves open the possibility that selection will be satisfied by some other feature that unlike Ā-features does not require movement to the left.

Let's discuss what this additional feature can be. First, all noun phrases standardly have a case probe, but heads of relatives with ICA have their case already valued inside the relative CP. Second, DPs may be subject to A-movement, but this movement does not seem to require an active feature on a moved DP. Should A-movement be associated with some active feature on the displaced constituent, the role would be again taken by case. Third, DPs are subject to scrambling and I assume that scrambling is derived by EPP-like probe on the attracting head (cf. discussions in Miyagawa 2001, Bailyn 2004) and there are no active features on DPs undergoing scrambling. Fourth, active features may be not connected to movement, but beyond searching for a case feature, DPs are rarely triggers for agree. One context where DPs are sometimes assumed to have active probes is binding. In particular, under the agree-based approach to binding, a bound syntactic object may have an unvalued ϕ and index features (Heinat 2006, Hicks 2009). In that case, however, an anaphor or a personal pronoun must be the head of the relative clause: Reflexives and reciprocals cannot head relative clauses. In some languages, personal pronouns are marginally possible as heads of relative clauses, but such relative clauses are restricted to the appositive interpretation and pronominal heads seem to be not able to be bound. Finally, the D head may have some features responsible for DP-internal argument reorderings such as, for instance, movement of an internal argument to the Spec,DP. However any such feature would be satisfied before the DP is embedded under further external material and therefore cannot fulfill a role of an active probe at the point when the DP is selected. Thus, it seems that once case is valued, the only active feature that a DP can have is the Ā-related feature that plausibly requires subsequent movement of the DP to the left edge.

3.3 The alternative

In this section, I will introduce the potential alternative analysis and show that it cannot be extended to the Moksha data despite being suggested for a very similar set of data. Before presenting the alternative, I would like to take stock of the analysis developed in this paper. I have suggested that obligatorily movement to the left is an instance of the forced ex-situ pattern, a type of the derivation where some syntactic constituent is formed and persists at an intermediate stage of the derivation, but must be destroyed before the derivation terminates. The analysis of forced ex-situ is coached in the model of syntax where syntactic operations, most notably merge, are feature-driven. The analysis relies on the idea that syntactic selection applies not just for the category of the selected syntactic object, but merge features may also have second order features and thereby prespecify which active features a selected syntactic object must have. This allows to determine subsequent behavior of the selected phrase, its agreement and movement. In particular, I have shown that movement of relative with ICA follows from the requirement for DPs to have an active feature at the point of selection. As case that typically fulfills the role of this active feature is already valued in relatives with ICA, their heads must have another active probe and this probe then gives raise to the left displacement.

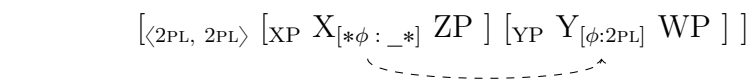
The alternative approach to forced ex-situ is framed in the model where merge applies freely, i.e., it is not triggered by features. The analysis relies on the labeling algorithm suggested in the series of papers by Chomsky (2013, 2015, 2019) and actively developed since then (see also Ott 2012, 2015, Gallego 2017, Epstein et al. 2020, Hayashi 2020, McInnerney 2022, Moro & Roberts 2023). I will now summarize this labeling algorithm as it was suggested in Chomsky (2013). The main idea of this approach to labeling is that labels are determined by minimal search. Minimal search automatically distinguishes two configurations. First, if a phrase is merged with a head as in (65), the head supplies the label, because it is a simpler, atomic computational item.

(65) $[_{\text{XP}}$ X YP]

Second, if two phrases are merged, minimal search cannot trivially find a unique label. There are then two ways to proceed. The first option is agreement as shown in (66a). In this sample derivation, X has an unvalued ϕ-probe that gets valued by the corresponding features on Y. This shared ϕ-feature is then selected as a label for the whole constituent. The second option to resolve the labeling problem is movement as shown in (66b). One of the merged phrases moves out and is therefore rendered invisible for the minimal search. The remaining phrase provides the label.

(66) [$_{?}$ XP YP]

a. Agreement for labeling



b. Movement for labeling

As discussed in detail by Ott (2012, 2015), the second scenario allows an account of forced ex-situ effect. It occurs when a constituent cannot be labeled and movement applies as a repair.

Let's now consider whether this approach derives forced ex-situ in Moksha relatives. I will start by considering the example repeated again in (67).

(67) ICA: GEN is external case, DAT is internal case

[Jalga-zˈə-nˈdˈi [kona-nˈdˈi tˈaš-nˈə-nˈ]] mon
friend-1SG.POSS.SG-DAT which-DAT write-FREQ-PST.1SG I
nˈɛj-sa kurək.
see-NPST.3SG.O.1SG.S soon

'I will soon see my friend to whom I have been writing.'

In this sentence, the head of the relative clause is the direct object of the main clause verb. Under the simplest assumptions on the clause structure, the direct object DP occupies the complement of the V head as shown in (68). As the DP is merged with the head, there is no labeling problem: The head straightforwardly

supplies the label and there is no need to move the DP out.[4]

(68) [v [V [$_{\text{DO}}$ D NP [$_{\text{RC}}$ ...]]]]

Some potential comes from the modification of the labeling algorithm suggested in Chomsky (2015). According to this addition, heads may be weak and weak heads cannot provide a label. They must be strengthened by the presence of the specifier that the weak head subsequently agrees with. The derivation of the simple clause thus proceeds as follows: First, the direct object merges with the weak root. To strengthen the weak root, the direct object DP undergoes movement to the specifier as shown in (69b). The root inherits probes from the phase head v and this allows for agreement in ϕ-features between the direct object and the root. The shared feature is then used as a label; see (69d). Note that agreement between the R head and the direct object is postulated for purely formal reasons and must be present in languages without overt object agreement.

(69) a. Merge: [R_{weak} DP]

b. Movement to Spec: [DP [R ~~DP~~]]

c. Agreement: [v [DP [$\text{R}_{[*\phi : \_*]}$ ~~DP~~]]]]

d. Labeling: [v [$_{\langle \phi, \phi \rangle}$ DP [R ~~DP~~]]]

In Moksha, verbs show overt agreement with some direct objects and this agreement is also possible with relative clause heads with CP-internal case; see (67). The shared agreement feature will be used to label and there is consequently no labeling problem that needs to be repaired by movement of the direct object DP that contains a relative clause.

The state of affairs is not different for other positions. For instance, subject DPs are typically first merged in Spec,vP creating a [XP YP] configuration problematic for labeling. The conflict is resolved by agreement between the subject and some verbal head: the v head in languages without EPP or the T head in languages with EPP. Importantly, in Moksha subject DPs that are modified by

relative clauses and show case marking from within the relative clause undergo regular agreement with the main clause verbs; see (70). There is thus once again no need to move the DP to the left.

(70) ICA: NOM is external case, GEN is internal case
Učа-t'n'ə-n' [kona-t'n'ə-n' mon' al'n'ɛka-z'ə
sheep-DEF.PL-GEN which-PL-GEN I.GEN uncle-1SG.POSS.SG
l'ɛc'-əz'ən'] is'ak aščʲ-i̯j-**t'** kut-t'
shoot-PST.3PL.O.3SG.S yesterday be-PST.3-PL house-DEF.SG.GEN
ingəl-ə.
before-LOC
'The sheep that my uncle shot were in front of the house.'

To sum up, in this section I have shown that the potential alternative analysis based on the labeling algorithm does not account for the Moksha case. More generally, it seems that the account of forced ex-situ patterns constitutes the main empirical advantage of feature-free approach over the model where syntactic operations are driven by features. In result, the feature-based analysis of the pattern takes away this empirical ground from the feature-free model and the labeling algorithm inextricably tied to this model. In the next section, I will show that the feature-based account covers the data that were so far derived under the feature-free alternative.

4 Extensions and outlook

4.1 Summary

On the empirical side, this paper presents a detailed investigation of relative clauses in Moksha. It shows that different derivations underlie superficially similar placement of correlatives and relatives with ICA on the left. Correlatives are base generated on the left, while relatives with ICA move to this position. Further looking at the movement of relatives with ICA, I conclude that there is no single feature triggering this movement. Finally, I also consider internal structure of relatives with ICA and show that these relatives are generated by raising.

On the theoretical side, second order merge features are the main contribution of this paper. They allow to account for the movement of relatives with ICA and for the forced ex-situ pattern in general. In this final section, I would like to show that forced ex-situ effects are not limited to relative clauses in Moksha. The pattern occurs with various phenomena cross-linguistically. I will discuss four such data points: split topicalization in German, relative pronouns in English, 'Big-DP' approaches to resumption, and wager-class verbs.

4.2 Split topicalization

The first case comes from split topicalization in German (see Fanselow 1988, Van Riemsdijk 1989, Fanselow & Ćavar 2002 among other). The phenomenon is illustrated in (71), where one part of the DP appears in its base position and the other part is topicalized to the left.

(71) **Bücher** hat Peter leider erst **drei gute** gelesen.
books has Peter unfortunately only three good read
'As for books, Peter has unfortunately only read three good ones.'

Ott (2012, 2015) argues that the derivation of split topicalization involves building a constituent that never appears on the surface and is obligatorily destroyed by movement. I will now summarize main arguments. All data presented below come from Ott (2015). Evidence for movement relies on islands (72), variable binding (73), and parasitic gap licensing (74).

(72) ***Bücher** war Peter traurig [nachdem seine Mutter **viele** weggeworfen
books was Peter sad after his mother many threw.away
hatte].
had
'As for books, Peter was upset after his mother threw many of them away.'

(73) **Bücher über einander$_i$** haben die Männer$_i$ noch nie **welche**
books about each.other have the men yet never any
geschrieben.
written
'As for books about each other, men never wrote any.'

(74) **Gäste** hat Sonja [ohne zu kennen] schon **viele** begrüßt.
guests has Sonja without to know already many greeted
'As for guests, Sonja has already greeted many without knowing them.'

The first piece of evidence showing that the constituent before movement is the one that never appears on the surface comes from inflection. In (75a), the split DP includes the negative modifier *keine* in the base position and the adjective shows strong inflection in the topicalized position. Example (75b) shows that *keine* requires weak inflection from the following adjective: If movement does not take place, weak inflection is ungrammatical.

(75) a. **Polnisch-e** **Gänse** gekauft hat sie **keine**.
Polish-STRONG geese bought has she no.STRONG
'As for Polish geese, she did not buy any.'

b. Sie hat keine **polnisch-en** Gänse (/ *keine
she has no.STRONG Polish-WEAK geese no.STRONG
polnisch-e Gänse) gekauft.
Polish-STRONG geese bought
'She did not buy any Polish geese.'

Second, an indefinite determiner and a preposition can be duplicated in both parts of the split noun phrase. Thus, simply undoing the movement does not yield a grammatical structure.

(76) **Eine Katze** habe ich nur **eine ganz kleine** gesehen.
a cat have I only a very small seen
'As for a cat, I only saw a very small one.'

(77) **In fremden Betten** ist er schon **in vielen** aufgewacht.
in stranger's beds is he already in many woken.up
'As for stranger's bets, he has already woken up in many of them.'

The final argument comes from the fact that the extracted syntactic object does not need to be a subconstituent of the regular DP. In (78), the topicalized phrase includes the noun and the relative clause modifying it, while the rest of the DP consists of the negative determiner and the prepositional phrase.

(78) **Bücher**, **die erfolgreich waren**, kennt er **keine von Maria**.
books that successful were knows he no by Maria
'As for books that were successful, he does not know any by Maria.'

Data in (79) show that the prepositional phrase appears between the noun and the relative clause. The order, where the relative clause follows the noun directly is ungrammatical, i.e., the phrase topicalized in (78) cannot be a constituent once it is brought together with the material appearing in-situ.

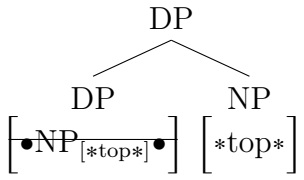
(79) a. keine Bücher von Maria, die erfolgreich waren
no books by Maria that successful were

b.*keine Bücher, die erfolgreich waren, von Maria
no books that successful were by Maria

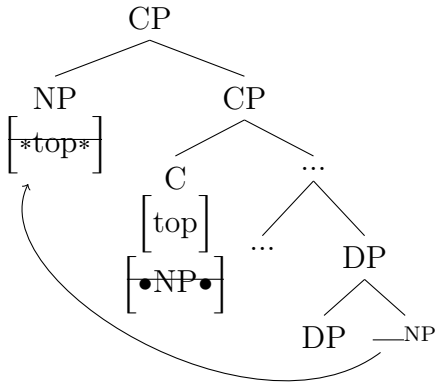
The data thus instantiate the forced ex-situ pattern. Ott (2012, 2015) suggests an account using the labeling algorithm as sketched in section 3.3 above. According to this approach, the full DP merges with topical NP in the base position. As two phrases are merged, labeling requires further operations and it is repaired by obligatorily movement of the NP.

I will adopt main insides on syntax of split topicalization from this earlier work and show that the data can be re-analyzed in the approach developed in this paper. Following Ott (2012, 2015), I assume that the regular DP can be merged with a second NP and that this NP is topical. In the feature-based approach, displacement of the NP follows from the assumption that full DPs may select for yet another NP only if this NP has the unchecked [∗top∗] probe. This active probe ensures that the DP is then moved to Spec,CP.

(80) Base structure



(81) Topicalization



4.3 Relative pronouns

The next case that I suggest represents the forced ex-situ pattern comes from relative pronouns. As noted by Aoun & Li (2003) and Heck (2005), some of the relative pronouns typically do not form a constituent with an overt noun. Example (82) shows that pronoun *who* in English can be used as a relative pronoun, but cannot form a constituent with a noun.

(82) a. the boy **who** was late

b.*__Who__ boy was late?

Similarly, German *denen* is a relative pronoun, but cannot modify an overt noun.

(83) a. die Freunde, **denen** ich vertraue
ART friends which.PL.DAT I trust
'friends that I trust'

b.*Ich habe **denen** Freunden vertraut
I have which.PL.DAT friends trust
'I trusted those friends.'

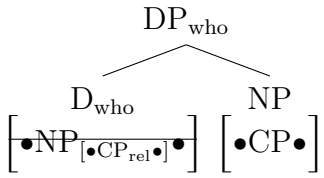
The inability of the relative pronoun to modify a noun is problematic for the raising derivation. Under the raising derivation, the head noun is first merged inside the relative CP as a constituent with the relative pronoun. The data in (84) suggest that relative clauses with *denen* can be derived by raising: The head of the

relative clause contains a pronominal variable bound by the material c-commanding the gap in the relative CP, but not the final position of the head noun.

(84) Seine$_2$ Freunde, **denen** jeder$_2$ vertrauen können sollte
his friends which.PL.DAT everone trust can should
'His friends whom everyone should be able to trust'

While originally thought to be a problem of the raising derivation, under the approach developed here this is in fact yet another case of the forced ex-situ. It follows if pronouns like *who* and *denen* select only for NPs with an unchecked CP merge feature that probes upward and ensures further movement of the NP.

(85) Base structure for relative pronouns



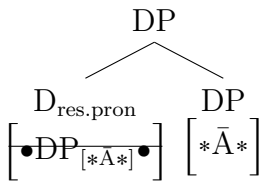
4.4 'Big-DP' approaches

The next case of forced ex-situ comes from the 'Big-DP' approach to resumption; see the case of movement resumption in Hebrew.

(86) Ha-ʔiš še-raʔiti **ʔoto**.
the-man that-I.saw him
'The man that I saw.' (Shlonsky, 1992, 444)

While there is no consensus on the correct analysis, it was argued that the resumptive pronoun and the moved DP occupy the regular argument position at an earlier point of the derivation. At the same time, a constituent that includes them both never appears in the resulting structure (see Aoun et al. 2001, Boeckx 2003). From the perspective advocated here, this is not a drawback of 'Big-DP' accounts, but another case of forced ex-situ. The data follow from selection requirement of the resumptive D:

(87) ‘Big-DP’ structure



4.5 Wager-class verbs

The final instance of the forced ex-situ pattern comes form the wager-class verbs (see Postal 1974, Kayne 1981 among others). The phenomenon is illustrated by the French data in (88). They show that the subject of the infinitival clause can be present only if it further moves to the left.

(88) a.*Je croyais le **garçon** [être arrivé].
I believe the boy to.have arrived
‘I believe the boy arrived.’

b. Le **garçon** que je croyais [être arrivé].
the boy that I believed to.have arrived
‘The boy that I believe arrived.’ (Kayne, 1981, 357)

Being not able to do justice to the extensive literature on this construction, I tentatively suggest that wager-class verbs allow raising of infinitival subjects to object position only if the raised DP has an active Ā-probe. This requirement can be formalized by second order selection feature on the verbal head: [•DP$_{[*\bar{A}*]}$•].

4.6 Outlook

To sum up, forced ex-situ effects are by no means restricted to relative clauses in Moksha. They are observed in various phenomena cross-linguistically. I have then shown that the approach to forced ex-situ that is based on second order selection features covers all considered cases of forced ex-situ, while the alternative relying on the labeling algorithm derives only a part of the data and does not account for the Moksha data presented in this paper.

I would like to suggest that such result has further implications for the ongoing debate on feature-driven versus feature-free merge. The analysis relying on second

order merge features clearly requires merge to be feature-driven, while the labeling algorithm that underlies the alternative is meaningful only in a model where there are no merge features and thus a simple 'the item that selects is the item that projects' rules cannot apply.

The difference between feature-free and feature-driven merge largely determines the shape of the syntactic theory, but there seems to be very few research that intends to access differences in a possible empirical coverage of the two approaches (see Müller 2017 and Safir 2019 for some explorations). Current research gives an empirical ground to this otherwise predominantly conceptual discussion and suggests that the model with feature-driven merge has a broader empirical coverage.

Notes

[1]I am calling the case of the direct object in Moksha genitive in line with the general tradition (most recently see Kholodilova 2018). It comes from the fact the the shape of the case marker used to mark direct objects and possessors is the same.

[2] Forced ex-situ effects are sometimes called *local instability* (see Ott 2012, 2015). I will refrain from using this term, because the constituent is in fact locally (at at intermediate stage of the derivation) but not globally stable from the theory-neutral point of view. The term local instability presupposes the analysis developed by Ott (2012, 2015) and based on the recent labelling algorithm by Chomsky (2013, 2015). I will consider this alternative analysis in more detail in section 3.3.

[3]A famous example of movement from one case position to another is hyperraising; see Zyman (2023) for a recent overview. A major difference between relatives with ICA and hyperraising is that hyperraised nouns typically show case assigned in their landing site and there is consequently no evidence that the case in the base position was indeed assigned.

[4]Alternatively, one may assume that the DP is not merged directly with the V head, but with a complex head that could, for instance, include the verbal root and a categorizing head. Such complex heads are still expected to behave as simple heads and be able to label; see Rizzi (2016).

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