Relative clauses in Moksha: Raising by reprojection

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Abstract

This paper presents novel data on relative clauses with inverse case attraction in Moksha Mordvin. This is a rare type of externally-headed relative clauses where the head noun bears case assigned inside the relative clause (see Bianchi 1999; 2000b, Kholodilova 2013, Deal 2016, Wood et al. 2017, Abramovitz 2021). On the basis of a correlation between a case marking on the head noun and reconstruction effects (idioms, anaphor binding, condition C), I argue that raising derivation of relative clauses is a part of natural language syntax (Schachter 1973, Vergnaud 1974, Kayne 1994, De Vries 2002, Sportiche 2017, i.a.) and that it co-exists with the head-external derivation (cf. Sauerland 1998; 2003, Bhatt 2002, Harris 2008 for co-existence of several relative clause derivations). The paper then suggests a novel implementation of the raising derivation: It is best accounted for if the head NP projects upon its movement to the main clause. Such projecting movement follows from projection by selection approach to labeling (Chomsky 1995, Stabler 1997, Adger 2003) combined with the possibility of upward search (Baker 2008, Zeijlstra 2012).

Keywords: Relative clauses, case, reconstruction effects, raising derivation, projection, Moksha Mordvin

1 Introduction

Inverse case attraction (ICA) is a phenomenon in the relative clause syntax under which the head of a postnominal relative clause bears case assigned to a relativized element inside the relative clause. It is schematized in (1). The head of the relative clause precedes the relative pronoun, but shows case α assigned by a predicate inside the relative clause, not case β assigned in the main clause.

(1)   [head-α [$_{CP}$ relative.pronoun-α ... predicate$_{[case:\ \alpha]}$...] ... predicate$_{[case:\ \beta]}$ ...]

This paper presents a study of relative clauses with ICA in Moksha Mordvin, a Finno-Ugric, Uralic language. Data in (2) show a relative clause with ICA in Moksha. In this example, the head of the relative clause appears in the direct object position of the main clause. Nouns in this position are typically assigned genitive; see (3) without the relative clause. Instead, the head noun in (2) is marked for dative. This case is assigned by the verb in the relative clause and also appears on the relative pronoun.

(2)   ICA: external case – GEN, internal case – DAT

Jalga-z'ə-**n'd'i**   [kona-**n'd'i** t'aš-n'ə-n']   mon n'ɛj-sa
friend-1SG.POSS.SG-DAT   which-DAT write-FREQ-PST.1SG I   see-NPST.3SG.O.1SG.S
kurək.
soon
'I will soon see my friend to whom I have been writing.'

(3) Mon n'ɛj-sa   kurək jalga-z'ə-**n'**   / *jalga-z'ə-**n'd'i**.
     I   see-NPST.3SG.O.1SG.S soon friend-1SG.POSS.SG-GEN   friend-1SG.POSS.SG-DAT
   'I will see soon my friend.'

Relative clauses with ICA are rare cross-linguistically and their syntax remains debated (see Bianchi 1999; 2000b, Kholodilova 2013, Cinque 2015; 2020, Deal 2016, Wood et al. 2017, Abramovitz 2021). In this paper, I will present novel data on relatives with ICA in Moksha Mordvin. The data were collected during my fieldwork with Moksha speakers who live in villages Lesnoe Cibaevo and Lesnoe Ardaševo, Republic of Mordovia, Russia. On the basis of these data, I will argue that relatives with ICA are externally-headed as shown in (4a) and are derived by raising; see (4b). Thus, this study provides further evidence in favor of the raising derivation and implies that it must be part of natural language syntax (Schachter 1973, Vergnaud 1974, Kayne 1994, De Vries 2002, Sportiche 2017, i.a.).

(4) a. [$_{DP}$ D [$_{NP}$ NP [$_{CPrel}$ ...]]]

    b. [$_{DP}$ head [$_{CP}$ C$_{rel}$ ... __$_{head}$]]

Relatives with ICA in Moksha co-exist with regular externally-headed relative clauses. I will show that these relatives differ from relatives with ICA and must be derived by head-external generation. This implies that several derivations for relative clauses must co-exist within one language (see also Sauerland 1998; 2003, Bhatt 2002, Harris 2008).

    After this, I review existing approaches to the syntax of raising and argue that raising relative clauses are best derived by projecting movement of the head noun as schematized in (5). I show that projecting movement follows naturally if projection by selection approach to labeling (Chomsky 1995, Adger 2003) is combined with the possibility of upward search (Baker 2008, Wurmbrand 2012, Zeijlstra 2012, Bjorkman & Zeijlstra 2019). The head of the relative clause originates inside the relative clause, but has an active Merge feature that probes upwards, finds the relative CP once it is built, and brings about movement of the head noun. Since the head NP bears the feature that triggers this merge step, the NP also projects in the landing site.

(5) Projecting movement in relative clauses
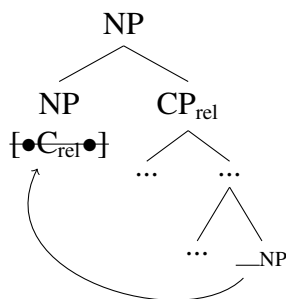
The paper proceeds as follows. In section 2, I provide evidence that relative clauses with ICA are externally-headed. In section 3, I consider the reconstruction diagnostics and show that relative

clauses with ICA are derived by raising and that raising cannot be the single derivation of relative clauses in Moksha. Section 4 presents an implementation of the raising derivation that is based on projecting movement of the head noun. Finally, section 5 considers further properties of relatives with ICA in Moksha and shows how they are derived under the current analysis.

2 ICA and typology of relative clauses

2.1 Background

Relative clauses with ICA were originally discussed on the basis of extinct Indo-European languages. They are attested in ancient Greek (Grimm 2005: 78-92), Hittite, Old Persian, Oscan, and Umbrian (Hahn 1964), Latin (Touratier 1980: 147-211), Middle High German (Pittner 1995), and Old English (Harbert 1983). Further research has shown that ICA is also present in several modern languages, including Besermyan Udmurt (Belyaev 2012, Kholodilova & Privizentseva 2015), Ingrian Finnish (Kholodilova 2013), Nez Perce (Deal 2016), non-standard Icelandic (Wood et al. 2017), and Koryak (Abramovitz 2021).

In the previous studies, different structures were assigned to relative clauses with ICA. First, they were argued to be a subcase of correlatives that differs from regular correlative clauses in that the order of a relative pronoun and a head noun is reversed (Pittner 1995, Belyaev 2012, Georgi & Salzmann 2017, and also Bianchi 1999; 2000b).

(6)   [$_{\text{CP}}$ head-α rel.pron-α ... case.assigner$_{[\text{case: } \alpha]}$ ...], [$_{\text{MC}}$... case.assigner$_{[\text{case: } \beta]}$ pron-β...]

Second, relatives with ICA were viewed as a type of internally-headed relative clauses where the head moves to the left of the relative pronoun, but remains within the relative CP. The relative CP is then embedded under a silent nominal structure.

(7)   [$_{\text{MC}}$ [$_{\text{DP}}$ D ... [$_{\text{CP}}$ head-α rel.pron-α ... case.assigner$_{[\text{case: } \alpha]}$ ...]] ... case.assigner$_{[\text{case: } \beta]}$]

Third, relatives with ICA were suggested to belong to externally-headed relative clauses and differ only in the case displayed by the head noun (Deal 2016).

(8)   [$_{\text{MC}}$ [$_{\text{DP}}$ ... head-α [$_{\text{CP}}$ rel.pronoun-α ... case.assigner$_{[\text{case: } \alpha]}$ ...]] ... case.assigner$_{[\text{case: } \beta]}$]

In what follows, I will argue that this latter view is correct and relatives with ICA are externally-headed.

2.2 Interpretation

The main argument for relative clauses with ICA being externally-headed comes from their interpretation. Since Grosu & Landman (1998) and Grosu (2002), three interpretations of relative clauses are typically identified — appositive, restrictive, and maximalizing — and there are cross-linguistically observed correlations between a syntactic type of the relative clause type and the set of its interpretations. In particular, correlatives are only maximalizing (Grosu 2002, Lipták 2009, Brasoveanu 2012, Lin 2020). Internally-headed relative clauses can be maximalizing or restrictive

(Grosu 2002; 2012, Watanabe 2004 as well as Hanink 2021, Hucklebridge 2022), but not appositive (Lehmann 1984: 278, De Vries 2002, Grosu 2012). Thus, if relatives with ICA can have an appositive interpretation, they must be externally-headed because such an interpretation is not available for correlatives or internally-headed relative clauses.

Under the appositive interpretation, the relative clause provides additional, background information on the head of the relative clause, it does not restrict the set of individuals the head noun refers to. Relative clauses with ICA can have an appositive interpretation as shown in (9)-(10). In (9), the appositive reading is ensured by a parenthetical within the relative clause. In (10), the head is a proper name.

(9) ICA: external case – NOM, internal case – GEN[1]

Rovnaj kaftə **pr'istupn'ik-n'ə-n'** [kona-t'n'ə-n' meždu pročim
straight two criminal-DEF.PL-GEN which-DEF.PL-GEN between others
kunda-z'ən' Pet'ɛ] vor'gəd'-kšn'ə-s'-t'.
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.'

(10) ICA: external case – NOM, internal case – GEN

Puškin-ən' [kona-n' jalga-nzə t'er-n'-əz' senat-ən'
Pushkin-GEN which-GEN friend-3SG.POSS.PL call-FREQ-PST.3.O.3PL.S senate-GEN
ploščad'-t'i] ašəz' sa-v.
square-DEF.SG.DAT NEG.PST.3SG come-PASS
'Pushkin, who his friends were calling to Senate Square, could not come. '

Relatives with ICA can be restrictive as well. The relative clause in (11) restricts the reference of the head noun, so that the sentence is compatible with a continuation stating that more criminals were running away and Petja did not catch all of them.

(11) ICA: external case – NOM, internal case – GEN

Pr'istupn'ik-n'ə-n' [kona-t'n'ə-n' kunda-z'ən' Pet'ɛ]
criminal-DEF.PL-GEN which-DEF.PL-GEN catch-PST.3PL.O.3SG.S Petja
vor'gəd'-kšn'ə-s'-t'.
run.away-AVR-PST.3-PL
'Criminals who Petja caught were running away.'

Relatives with ICA also show other properties that are characteristic for externally-headed relatives. As shown in (12), they allow for stacking: One external head may be modified by two relative clauses. The same case is assigned to the gap in both relative clauses. This case is genitive and it also appears on the head noun, instead of the nominative that is expected given the position of the head noun in the main clause.

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[1]The shape of the case marker on direct objects in Moksha is identical to the case that appears on possessors. I will call this case genitive in line with the existing tradition (Koljadënkov & Zavodova 1962).

(12) ICA: external case – NOM, internal case – GEN

Pɛr'ɛkɛ-t' [**kona-n'** pid'-əz'ə sas'ədə-z'ə]
pie-DEF.SG.GEN which-GEN cook-PST.3SG.O.3SG.S neighbor-1SG.POSS.SG

[**kona-n'** min' srazu seva-s'k] ul'-s' kapsta-n'.
which-GEN we immediately eat-PST.3.O.1PL.S be-PST.3[SG] cabbage-GEN

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

I conclude that relatives with ICA in Moksha are externally-headed. Existing literature often uses properties of relative clauses such as extraposition or coordination of two relative CPs to diagnose the syntactic type of a relative clause. I will return to these properties in section 5 and show that the results are compatible the proposed analysis and these diagnostics in fact shed little light on the position of the head inside or outside of the relative CP.

2.3 Structures for externally-headed relatives

Relative clauses considered externally-headed from a typological perspective are assigned different syntactic structures in the formal literature. There are two main options. The first structure is illustrated in (13) and it shows a regular noun phrase structure for the head noun. The relative CP is combined directly with the NP and the full NP appears in the complement of the external D head. The second structure is given in (14) and it owes its existence to the raising derivation, under which the head originates inside the relative CP and moves to its surface position. Since movement targets specifier positions, the head NP also occurs in the specifier. Analyses differ with respect to the identity of the projection that the head NP is a specifier to. It was suggested to be one of the extended C layers (Bianchi 1999; 2000b) or some nominal head, e.g., *n* (Bhatt 2002, Deal 2016).

However, independently of the label of this projection, it breaks down the head-complement relation between the D head and the NP, so that NP is not D's complement, but a specifier of D's complement. This structural anomaly was noted and argued to give incorrect empirical predictions for a number of phenomena including inflection on nominal modifiers that must be determined by an immediately c-commanding D head (cf. Heck 2005 on German) and anti-pronominal contexts that require a lexical DP and cannot be satisfied by a D head and an NP in the specifier position (Pankau 2018).

(13) DP has a regular structure
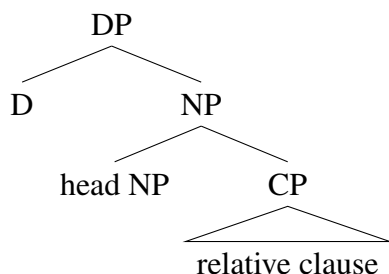
(14) NP is in Spec,XP
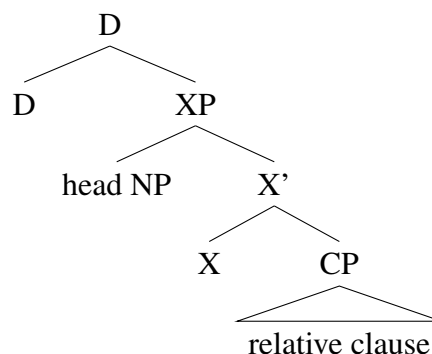
I will now show that the structure in (14) also makes incorrect predictions for nominal inflection in Moksha relative clauses. The evidence comes from definiteness marking. As shown in (15), nouns in Moksha are morphologically marked for definiteness. It is realized by a suffix that also expresses number and case information.
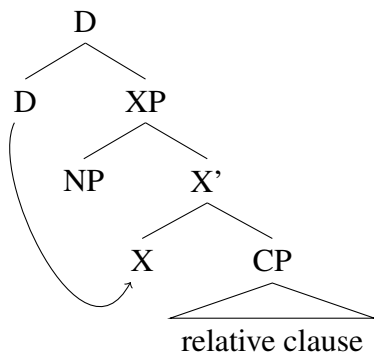
(15) a. kodamə bd'ə pin'ə-**n'd'i**
          how   INDEF dog-DAT
          'to some dog'

      b. t'ɛ pin'ə-**t'i**
          this dog-DEF.SG.DAT
          'to this dog'

Data in (16) show that heads of relative clauses with ICA bear this regular definiteness inflection.

(16) a. ICA: external case – NOM, internal case – DAT
          T'ɛ pin'ə-**t'i**   [kona-n'd'i maks-ən'   jar̥ca-ma] ašč-i   dvor-sə.
          this dog-DEF.SG.DAT which-DAT give-PST.1SG eat-NZR be-NPST.3[SG] yard-IN
          'This dog that I gave food is in the yard.'

      b. ICA: external case – NOM, internal case – DAT
          Kodamə bd'ə pin'ə-**n'd'i** [kona-n'd'i maks-ən'   jar̥ca-ma] ašč-i
          how   INDEF dog-DAT   which-DAT give-PST.1SG eat-NZR be-NPST.3[SG]
          dvor-sə.
          yard-IN
          'Some dog that I gave food is in the yard.'

Since definiteness is associated with the D head, not the noun itself, further operations need to apply for definiteness to be morphologically realized on a noun. For instance, this can be ensured by head movement of the N to the D head in syntax or by Lowering of the definiteness to the N head in morphology. Both these operations are set up to target heads in one projection line (Travis 1984, Baker 1988, Embick & Noyer 2001), so they produce a correct outcome if a DP that heads a relative clause has a regular DP structure as in (13). For the structure in (14), both head movement and Lowering predict that the D head interacts with the head of the additional functional projection X that hosts NP in its specifier, not the NP head of the relative clause. For instance in case of Lowering, definiteness then is predicted to appear on the X head, not on the noun; see (17).

(17) Lowering approach to definiteness inflection

```
              D
           /     \
         D        XP
        /        /    \
       |       NP       X'
       |        |      /    \
       |        |     X      CP
       |        └──→ ↑      /  \
       └──────────────     relative clause
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The argument so far depends on established tools of combining syntactic heads into words, but it can be further generalized to be independent of the specific operations that bring inflection onto a noun. I will now show that definiteness in Moksha is more generally not realized in the structural position occupied by the noun in (14); i.e., on specifiers of the main projection line. The evidence comes from adnominal modifiers as in (18). These modifiers are nominal themselves, but lack the DP layer as witnessed by their inability to be modified by a demonstrative or be definite; see (18b-c).

(18) a. Son n'ɛj-əz'ə   [s'en'əm sel'mə] s't'ər'-n'ɛ-t'   /
          she see-PST.3SG.O.3SG.S blue   eye   girl-DIM-DEF.SG.GEN

      b. *[t'ɛ s'en'əm sel'mə] s't'ər'-n'ɛ-t'   /
           this blue   eye   girl-DIM-DEF.SG.GEN

      c. [s'en'əm sel'mə-(*s'/*t'n'ə)]   s't'ər'-n'ɛ-t'.
          blue   eye-DEF.SG/DEF.PL girl-DIM-DEF.SG.GEN
          'She saw the girl with (these/ the) blue eyes.'

These noun phrases are parallel to the structures assigned to heads of relative clauses by (14) in that there is an NP that modifies the main projection line in the DP. Data in (19) show that definiteness belonging to the main projection line cannot be realized on NPs in this structural position.

(19) Son n'ɛj-əz'ə
      she see-PST.3SG.O.3SG.S

      a. [t'ɛ   [s'en'əm sel'mə] s't'ər'-n'ɛ-**t'**]
          this   blue   eye   girl-DIM-DEF.SG.GEN

      b. * [t'ɛ   [s'en'əm sel'mə-**t'**]   s't'ər'-n'ɛ]
            this   blue   eye-DEF.SG.GEN girl-DIM

      c. * [t'ɛ   [s'en'əm sel'mə-**s'**]   s't'ər'-n'ɛ-**n'**].
            this   blue   eye-DEF.SG.NOM] girl-DIM-GEN
          'She saw this girl with blue eyes.'

Thus, independently of the exact mechanism that could bring about a correct inflection in relative clause heads under the structure with the additional XP in (14), it would predict that the definiteness from the D head is also realized on the modifier instead of the noun in (19), contrary to the facts.

To sum up, in this section I have argued that despite internal case marking on the head noun relatives with ICA are externally-headed and their heads must have a regular noun phrase structure. In the next section, I will turn to the CP-internal syntax of relatives with ICA.

3   Relative CP-internal syntax

3.1   Background

There are three major derivation types proposed for externally-headed relative clauses: raising, matching, and head-external. Under the raising derivation, the head of the relative clause is first merged in the relativized position within the relative CP and then moves up to head the relative clause (Schachter 1973, Vergnaud 1974, Kayne 1994, Donati & Cecchetto 2011, Sportiche 2017).

(20) $[_{DP}$ head $[_{CP}$ C$_{rel}$ ... __head]]

Under the matching account, there are two instances of the head noun, not related by movement. One head is generated inside the relative CP and the other one is outside. Since the two heads are identical, one of them is deleted before the derivation terminates (Munn 1994, Cresti 2000, Citko 2001, Salzmann 2006; 2017; 2018, Cinque 2015; 2020).

(21) $[_{DP}$ head $[_{CP}$ ~~head~~ C$_{rel}$ ... __head]]

Finally, under the head external structure, the head is base merged outside of the relative CP and there is no representation of the head noun inside the relative CP (Partee 1975, Chomsky 1977, Jackendoff 1977, Haegeman 1994, and Boef 2012 to some extent).

(22) $[_{DP}$ head $[_{CP}$ ... C$_{rel}$ ...]]

Relative clauses with ICA are prominent in the debate on what is the correct derivation of relative clauses because they differ from regular externally-headed relative clauses in that the head noun shows case assigned inside the relative CP. Such case marking straightforwardly follows under the raising derivation: The head noun is base merged inside the relative clause, receives case in this position, and then moves to the main clause (see Bianchi 1999; 2000b, Deal 2016).

(23) $[_{DP}$ head-DAT $[_{CP}$ C$_{rel}$ ... predicate$_{[dat]}$ __head-DAT] predicate$_{[nom]}$]

In this section, I will provide evidence showing that the raising derivation indeed underlies relative clauses with ICA. I will apply well-established reconstruction diagnostics to relatives with

ICA and compare this type of relative clauses and regular externally-headed relative clauses also attested in Moksha; see (24a) with ICA and (24b) with an external case.

(24) a. No ICA: external case – GEN, internal case – DAT

Jalga-z'ə-**n'**　　　　[kona-**n'd'i**　t'aš-n'ə-n'　　　is'ak]　mon
friend-1SG.POSS.SG-GEN　which-DAT write-FREQ-PST.1SG yesterday I

n'ɛj-sa　　　　　kurək.
see-NPST.3SG.O.1SG.S soon

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

b. ICA: external case – GEN, internal case – DAT

Jalga-z'ə-**n'd'i**　　　　[kona-**n'd'i**　t'aš-n'ə-n'　　　is'ak]　mon
friend-1SG.POSS.SG-DAT　which-DAT write-FREQ-PST.1SG yesterday I

n'ɛj-sa　　　　　kurək.
see-NPST.3SG.O.1SG.S soon

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

I will show that the results are best accounted for if relatives with ICA are derived by raising and the raising derivation co-exists with another derivation type that underlies relatives with external case in Moksha.

3.2 Idioms

The first diagnostic involves 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, McCawley 1998: 57). The ability of a head noun to build an idiom with a material in the relative CP or in the main clause shows whether the head noun is base generated in the main or in the relative clause. I will use Moksha idiom *pan'žəms potmə.* It means 'to tell everything' and is literarily composed out of verb *pan'žəms* 'to open' and noun *potmə* meaning 'stomach' or 'gut' in the direct object position.

I start with the scenario where the idiom is placed inside the relative CP. In (25a-b), the head noun builds an idiom with the predicate of the relative clause. The data show that the head noun is then obligatorily marked for the internal case; that is, idiomatic interpretation inside the relative clause is possible for relatives with ICA, but not for regular externally-headed relative clauses.

(25) a. ICA: external case – NOM, internal case – GEN

Potmə-nc　　　　[kona-n'　Vas'ɛ **pan'ž-əz'ə**　　　ava-ncti
gut-3SG.POSS.SG.GEN which-GEN Vasja open-PST.3SG.O.3SG.S wife-3SG.POSS.SG.DAT

__] kunarə　af　maks-i　　　pokoj.
　long.ago NEG give-PST.3[SG] rest

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

b. No ICA: external case – NOM, internal case – GEN

*Potmə-c   [kona-n'   Vas'ɛ **pan'ž-əz'ə**   ava-ncti
gut-3SG.POSS.SG.NOM   which-GEN Vasja open-PST.3SG.O.3SG.S wife-3SG.POSS.SG.DAT

__] kunarə   af   maks-i   pokoj.
     long.ago NEG give-PST.3[SG] rest

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

The idiom is formed by the head of the relative clause and the predicate of the main clause in (26a-b). Unlike in the previous scenario only the case assigned in the main clause is grammatical on the head noun, ICA is not possible.

(26)   a.   No ICA: external case – GEN, internal case – NOM

Potmə-nc   [kona   kunarə   af   maks-i   pokoj] Vas'ɛ
gut-3SG.POSS.SG.GEN   which[NOM] long.ago NEG give-PST.3[SG] rest   Vasja

pan'ž'-əz'ə   ava-ncti.
open-PST.3SG.O.3SG.S wife-DEF.SG.DAT

'Vasja revealed to his wife everything that was worrying him for a long time.'

b.   ICA: external case – GEN, internal case – NOM

*Potmə-c   [kona   kunarə   af   maks-i   pokoj] Vas'ɛ
gut-3SG.POSS.SG.NOM   which[NOM] long.ago NEG give-PST.3[SG] rest   Vasja

pan'ž'-əz'ə   ava-ncti.
open-PST.3SG.O.3SG.S wife-DEF.SG.DAT

'Vasja revealed to his wife everything that was worrying him for a long time.'

Thus, the data show a one-to-one correspondence between the case marking on the head noun and idiomatic interpretation. If the idiom is in the relative clause, the case assigned in the relative clause is required. If the idiom is in the main clause, the head noun must be also marked for the case assigned in the main clause.

3.3 Anaphor binding

The next reconstruction effect is based on binding of anaphors. Moksha has several ways of expressing reflexivity (see Toldova & Shalganova 2018 for a recent description). In the adnominal position that is relevant for this diagnostic simple reflexive *es'* is used; see (27). This pronoun is obligatorily bound by the c-commanding noun phrase.

(27)   Van'ɛ$_i$ es'$_{i/*j}$ var'aga-nc   mu-z'ə.
Vanja self   mitten-3SG.POSS.SG.GEN find-PST.3SG.O.SG.S
'Vanja$_i$ found his$_{i/*j}$ mitten.' (Toldova & Shalganova 2018: 654)

I will now turn to binding in relative clauses and start with the case where the binder is inside the relative clause. In (28a-b), the head of the relative clause contains the reflexive. This example

shows that binding by the CP-internal material succeeds if the head noun is marked for the internal case, but is ungrammatical if the head shows external case.

(28)   a.   ICA: external case – NOM, internal case – GEN

Es'$_i$ kud-**ənc**   [kona-n'   **Vas'ɛ$_i$** mi-z'ə]   t'ɛn'i
self house-3SG.POSS.SG.GEN   which-GEN Vasja sell-PST.3SG.O.3SG.S now

ašč-i   savə.
be-PST.3[SG] empty

'His$_i$ house that Vasja$_i$ sold is now empty.'

       b.   No ICA: external case – NOM, internal case – GEN

****Es'$_i$** kud-**əc**   [kona-n'   **Vas'ɛ$_i$** mi-z'ə]   t'ɛn'i
self house-3SG.POSS.SG.NOM   which-GEN Vasja sell-PST.3SG.O.3SG.S now

ašč-i   savə.
be-PST.3[SG] empty

'His$_i$ house that Vasja$_i$ sold is now empty.'

Data in (29a-b) show that the result holds if the antecedent for the reflexive pronoun is inanimate and thereby logophoric binding is excluded (see Charnavel & Sportiche 2016, Charnavel 2019, and Charnavel & Bryant 2022).

(29)   a.   ICA: external case – NOM, internal case – DAT

Es'$_i$ luv-ij-ənzə-**n'd'i**   [kona-t'n'ə-n'd'i   t'ɛ **kn'iga-s'$_i$**
self read-PTCP.ACT-3SG.POSS.PL-DAT   which-DEF.PL-DAT this book-DEF.SG.NOM

maks-i   nad'əja-ma __] uč-ij̊-t'   pe.
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.'

       b.   No ICA: external case – NOM, internal case – DAT

****Es'$_i$** luv-ij-ənzə   [kona-t'n'ə-n'd'i   t'ɛ **kn'iga-s'$_i$**
self read-PTCP.ACT-3SG.POSS.PL[NOM]   which-DEF.PL-DAT this book-DEF.SG

maks-i   nad'əja-ma __] uč-ij̊-t'   pe.
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.'

However, anaphor binding differs from idioms in that there is no correlation between anaphor binding in the main clause and the case of the head noun. In (30a-b), the reflexive is still embedded in the head noun, but the binder is positioned within the main clause. The head noun may be marked for the case assigned in the main clause or for the case assigned in the relative clause. Both markings are grammatical.

(30) a. ICA: external case – GEN, internal case – DAT

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

pet'-əz'ə.
repair-PST.3SG.O.3SG.S

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

b. No ICA: external case – GEN, internal case – DAT

Es'$_i$ mašina-**nc** [kona-n'd'i put-f lama jarmak] **Vas'ɛ$_i$** dagə
self car-3SG.POSS.SG.GEN which-DAT put-PTCP.RES many money Vasja again

pet'-əz'ə.
repair-PST.3SG.O.3SG.S

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

To sum up, binding of the anaphor in the relative clause forces internal case on the head noun while binding in the main clause is grammatical with both internal and external case.

3.4 Condition C

The final diagnostic relies on condition C. It requires for R-expressions to be free throughout the derivation (Chomsky 1981). This diagnostic applies to the relative clauses as follows: The head noun phrase contains an R-expression and the relative clause includes a third person pronoun in the position that c-commands the gap inside the relative CP. Example (31) shows that in this scenario the internal case marking on the head noun incurs the violation of condition C: *Pushkin* in the head noun cannot co-refer with the pronoun in the subject position of the relative clause.

(31) ICA: external case – NOM, internal case – GEN

Puškin-ən'$_j$ kn'iga-**nc** [kona-n' **son$_{i/*j}$** t'ɛšt'-əz'ə
Pushkin-GEN book-3SG.POSS.SG.GEN which-GEN PRON.3SG write-PST.3SG.O.3SG.S

__ Pavləfskɛj dača-sə] ašč-i bibl'iat'eka-sə-nək.
pavlosk's country.house-IN be-NPST.3[SG] library-IN-1PL.POSS

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

Coreference between the proper name and the pronoun is possible if the head noun is marked for the external case.

(32) No ICA: external case – NOM, internal case – GEN

Puškin-ən'$_j$ kn'iga-**c** [kona-n' **son$_{i/j}$** t'ɛšt'-əz'ə
Pushkin-GEN book-3SG.POSS.SG.NOM which-GEN PRON.3SG write-PST.3SG.O.3SG.S

__ Pavləfskɛj dača-sə] ašč-i bibl'iat'eka-sə-nək.
pavlosk's country.house-IN be-NPST.3[SG] library-IN-1PL.POSS

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

To sum up, coreference between the proper name in the head and a pronoun in the relative clause forces external case and is blocked by the internal case marking.

3.5 Analysis

The table in (33) summarizes the application of the reconstruction diagnostics to relative clauses in Moksha. It shows that relative clauses have different reconstruction profiles depending on the case marking of the head noun. In particular, relative clauses with ICA allow idioms and anaphor binding in the relative clause and cannot obviate the violation of condition C. Relatives with the regular external case allow for idioms in the main clause and obviate condition C violations. Both types of relative clause are compatible with anaphor binding in the main clause.

(33)   Reconstruction in Moksha relative clauses

Diagnostics	Relative clause with internal case (ICA)	Relative clause with external case
1. Idiom in the relative clause	OK	*
2. Idiom in the main clause	*	OK
3. Anaphor binding in the relative clause	OK	*
4. Anaphor binding in the main clause	OK	OK
5. Condition C in the relative clause	*	OK

I would like to suggest that this empirical picture is best derived if relative clauses with ICA are derived by raising. As mentioned above, this straightforwardly accounts for the internal case marking on the head: The head noun is base generated inside the relative CP, gets its case there, and then moves to the main clause afterwards.

(34)   Raising derivation for relatives with internal case

    [$_{DP}$ head-INT.CASE [$_{CP}$ rel.pron C$_{rel}$ ... ___head-INT.CASE ...]]

Such derivational path of the head noun also accounts for the reconstruction profile of relatives with ICA. First, assuming that parts of an idiom must be base generated together, first merge inside the relative clause enables idioms inside the relative clause. The position in the main clause is derived by movement, so that the requirement for parts of an idiom to be base generated together is not met in the main clause and idiomatic interpretation is not available.

Second, I assume that anaphor binding applies in syntax (Reuland 2001; 2011, Hicks 2008; 2009, Rooryck & Vanden Wyngaerd 2011, Murugesan 2022) and is derived by Agree. Similarly to other instances of Agree, anaphor binding may apply at any stage of the syntactic computation as soon as the c-command requirement between a probe and a goal is satisfied. This accounts for the anaphor binding data in the following way: Since heads of relatives with ICA are base merged in relative CPs, the reflexive pronoun contained in the head is c-commanded by any relative clause-internal material that c-commands the gap position and can be bound there. After movement out of the relative clause to the main clause, the head NP is c-commanded by the main clause material

and appears in the same local domain with it. Therefore, anaphor binding is possible in the main clause as well.

Third, I assume that condition C holds in syntax and known cases of Condition C obviation involving A-movement and adjuncts are accounted for by late merge (cf. Lebeaux 1998, Takahashi & Hulsey 2009), Keine & Bhatt 2019). Under the raising derivation in (34), the head noun must be inside the relative clause to get internal case, the late merge is blocked. As a result, condition C applies in the relative CP internal position and cannot be obviated.

Relative clauses with external head show a different reconstruction profile. I suggest that it is derived by the the head-external derivation sketched in (35). The head noun is base generated in the main clause, it never was a part of the relative CP and therefore cannot show case assigned there.

(35) Head-external derivation for relatives with external case
[$_{DP}$ head-EXT.CASE [$_{CP}$ rel.pron C$_{rel}$ ...]]

The first merge position of the head noun phrase in the main clause enables idioms in the main clause and rules out idioms in the relative clause. Similarly, since the head is first merged in the main clause, an anaphor contained in the head noun phrase cannot be c-commanded and bound within the relative clause. Finally, the head noun was never part of the relative clause, so it is not evaluated for condition C there.

Overall, this analysis supports the co-existence of two structures for relative clauses in one language (Sauerland 1998, Bhatt 2002, Harris 2008) and provides yet another case where superficially similar phenomena have different syntactic derivations.
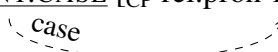
3.6 Alternatives

In this section, I will show that other derivations alone or in combinations fail to derive the data.

I will start with an account where head-external approach underlies both relatives with ICA as well as relative clauses with external case. Under the proposal above, the head-external structure derives relative clauses with external case, but not relative clauses with ICA. In principle, head-external generation can also account for the possibility of case attraction: The head noun is base generated in the main clause, but gets its case via agreement with a relative pronoun that bears case assigned inside the relative CP and moves to the left periphery of the relative clause (cf. Harbert 1983, Gračanin-Yuksek 2013, and also Bader & Meng 1999, Bader & Bayer 2006, Czypionka et al. 2018).

(36) ICA by agreement
[$_{DP}$ head-INT.CASE [$_{CP}$ rel.pron-INT.CASE C$_{rel}$ ... __$_{rel.pron}$ ...]]
$case$

However, the challenge is that this agreement in case must alter the reconstruction profile of the head noun. In particular, Agree with the relative pronoun must enable the interpretation of the head noun inside the relative CP. This clearly does not follow from the Agree operation as it stands and to the best of my knowledge such consequences of Agree are unknown for its other applications.

Therefore, I conclude that the head-external only approach is not suitable to derive all relative clauses in Moksha.

Another option is that the raising derivation currently suggested only for relatives with ICA underlies relatives with regular external case as well. This is possible if being merged inside the relative clause the head does not receive case in its base position, but case assignment can be postponed until after movement; see (37b).

(37) Raising only

    a. ICA: Case assignment before movement

        [$_{DP}$ __ [$_{CP}$ rel.pron C$_{rel}$ ... <u>head-INT.CASE</u> ...]]

    b. No ICA: Case assignment after movement

        [$_{DP}$ <u>head-EXT.CASE</u> [$_{CP}$ rel.pron C$_{rel}$ ... __ ...]]

While in section 4.3, I will suggest that the version of raising with late case assignment in (37b) is indeed attested in other languages, it does not account for relative clauses with external case in Moksha. The problem again lies in the account of the reconstruction data. Despite the same base positions and derivational paths, heads of relative clauses with internal and external case in Moksha show connectivity to different positions, and it seems that the case marking determines which position this is. Such a dependency between case and connectivity resembles the distinction between A and Ā movement: A-moved noun phrases get case in their landing position and, as a rule, are not evaluated for condition C in their base position. They are thus similar to the heads with the external case. Ā-moved noun phrases, on the contrary, get case in their base position and are evaluated in their base position for condition C as well. They are thus similar to the heads with the internal case. This is, however, where similarities end. Binding of reflexives is typically possible in a base and in a final position independently of a movement type (see, e.g., Barss 1986; 2001), while the data above show that heads with the external case cannot be bound in the relative CP, in what would be is their base position under this account. Similarly, both A- and Ā-moved phrases can form an idiom in their first merge position (cf. Postal 1974). This again differs from the behavior of heads with the external case, which do not form idioms in the relative CP.

The final alternative analysis for relative clauses in Moksha involves matching derivation. Matching can account for relative clauses with internal case marking if the external head is deleted and the internal head is phonologically realized (Cinque 2015; 2020, Wood et al. 2017, and to some extent Abramovitz 2021).

(38) ICA by matching

    [[$_{DP}$ ~~head-EXT.CASE~~ [$_{CP}$ head-INT.CASE relative.pronoun ...]] ...]

The problem is however that heads with internal case appear to the left of the relative pronoun. This means that the internal head must still move across the relative pronoun as shown in (39). In result, matching needs to include raising as its proper subpart and it must be additionally followed by the deletion of the second external instance of the head.

(39) [~~head-EXT.CASE~~ <u>head-INT.CASE</u> [$_{CP}$ [$_{DPrel}$ rel.pron-INT.CASE __head] C$_{rel}$ ... __DPrel ...]]

Next, if matching were the only derivation of relative clause, and needed to account for both relative clauses with ICA and relative clauses with external case, then relatives with external case could be derived by deletion of the internal head; see (40).

(40) [head-EXT.CASE ~~head-INT.CASE~~ [$_{CP}$ [$_{DPrel}$ rel.pron-INT.CASE __head] C$_{rel}$ ... __DPrel ...]]

In that case, relatives with ICA and relatives with external case share the syntactic part of the derivation and differ in which of the two heads is realized at PF. In order to derive correlation between case and reconstruction effects, PF-realization of the head must correlate with its interpretational possibilities in the following way: If the external head is pronounced, only the external head must participate in idiomatic interpretation, anaphor binding, and condition C. The internal head must be invisible for these processes. If the internal head is realized, the internal position must be visible for idiom interpretation and condition C, but both the external and the internal head remain accessible for anaphor binding. This does not follow from PF-deletion of a head and further contradicts known applications of the matching analysis that accounts for the reconstruction in regular externally-headed relative clauses as in English or German by assuming that the external head can be pronounced, while the internal head is interpreted (Salzmann 2018).

4 The syntax of raising

4.1 Background

In the previous two sections, two conclusions were reached. First, relative clauses with ICA are externally-headed and their external head has a regular DP structure as shown in (41). Second, these relative clauses are derived by raising of the head noun phrase from the relativized position in the relative clause to the main clause; see (42).

(41) The final structure of relative with ICA:
      [$_{DP}$ D [$_{NP}$ NP [$_{CPrel}$ ...]]]

(42) Movement of the head noun
      [$_{DP}$ head [$_{CP}$ C$_{rel}$ ... __head]]

It turns out that providing a theoretical account that combines these two conclusions is surprisingly non-trivial. The problem is that the head noun phrase moves from within the relative clause and movement typically proceeds to specifier positions; see (43).[2]

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[2]Following Heck & Müller (2007), I will indicate Merge features as as [•F•] and Agree features as [∗F∗].
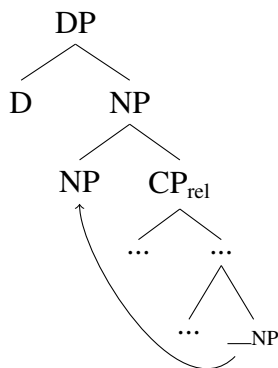
(43) Movement
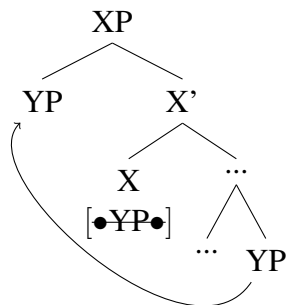
For this reason, several formal accounts of relative clauses place the head noun in a specifier position of some additional functional projection (Bianchi 1999; 2000b, Bhatt 2002, Deal 2016). But as discussed in section (2.3) such structure does not allow the head NP to be the complement of the external D head and are disqualified on the empirical grounds.

What seems to be required to account for both movement of the head noun and the correct noun phrase structure is projecting movement of the the head noun phrase; i.e., the NP moves to merge with the CP and projects in its landing site yielding an NP. This NP is then selected by the external D head; see (44).

(44) Projecting movement in relative clauses

The idea that an empirically accurate implementation of the raising syntax should involve projecting movement is not new; see the discussion by Bhatt (2002). Donati (2006), Donati & Cecchetto (2011), Cecchetto & Donati (2016) develop an implementation of the raising that employs projecting movement. The account is based on labeling algorithm by Chomsky (2013), according to which labeling of newly created syntactic objects relies on Minimal Search. This system suggests that if a projection is built by merge of a head and a phrase, the search always detects the head first, as it is a computationally simpler item. This accounts for projection of the head noun in relative clauses as follows: The head moved from within the relative clause is a syntactic terminal and therefore it projects in its landing site.

While accounting for the theoretically challenging notion of projecting movement, this analysis requires that it is only the N head that is moved from within the relative CP. This does not allow

to account the reconstruction effects that the raising derivation is set out derive, because elements that require to be interpreted in a position within the relative clause are often modifiers of the N head rather than the N head itself. As a result, this approach also does not derive the Moksha data. Recall from sections 3.3 and 3.4 that anaphors embedded in the nominal DP can be bound within the relative CP (see (45)) and nominal modifiers are evaluated there for condition C (see (46)). These data provide primary evidence in favor of the raising derivation, but also require for more than just an N head to move from inside the relative CP.

(45) ICA: external case – NOM, internal case – DAT

Es'ᵢ luv-ij-ənzə-**n'd'i**   [kona-t'n'ə-n'd'i   t'ɛ **kn'iga-s'ᵢ**
self read-PTCP.ACT-3SG.POSS.PL-DAT   which-DEF.PL-DAT this book-DEF.SG.NOM

maks-i   nad'əja-ma] uč-ij̊-t'   pe.
give-NPST.3[SG] hope-NZR   wait-NPST.3-PL end

'Itsᵢ readers whom this bookᵢ gave hope are waiting for the continuation.'

(46) ICA: external case – NOM, internal case – GEN

Puškin-ən'ⱼ   kn'iga-**nc**   [kona-n'   **sonᵢ/*ⱼ**   t'ɛšt'-əz'ə
Pushkin-GEN book-3SG.POSS.SG.GEN   which-GEN PRON.3SG write-PST.3SG.O.3SG.S

__ Pavləfskɛj dača-sə]   ašč-i   bibl'iat'eka-sə-nək.
    Pavlosk's country.house-IN be-NPST.3[SG] library-IN-1PL.POSS

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

To sum up, existing implementations of the raising derivation do not account for the relative clauses with ICA in Moksha. In the next section, I will suggest an implementation of the raising derivation that combines projecting movement and the phrasal status of the head noun.

4.2 Projecting movement

I would like to suggest that projecting movement follows from two assumptions. First, labels of newly created projections are established according to the projection by selection principle (Chomsky 1995, Adger 2003 as well as Stabler 1997):

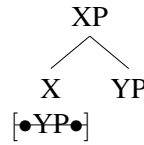(47) Projection by selection
      The item that selects is the item that projects.

This principle states that the label of a newly created projection is determined by selection, a syntactic object with a merge feature that triggers a given merge step also provides the label; see (48)-(49).

18

(48) Merge

```
      ╱╲
     X    YP
   [•YP•]
```

(49) Labeling

```
        XP
       ╱╲
      X    YP
    [•Y̶P̶•̶]
```
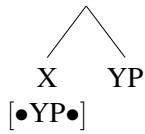
Second, probing can apply upwards. The notion of upward search was suggested for Agree (Baker 2008, Wurmbrand 2012, Zeijlstra 2012, Himmelreich 2017, Bjorkman & Zeijlstra 2019) and here I extend this possibility to merge features as well.

Projecting movement then takes place if a syntactic object enters the derivation with an active merge feature and is embedded under further material before this feature can be checked as in (50). This merge feature probes upwards and as it finds its goal, the phrase moves upwards. This movement step is triggered by the merge feature on the displaced syntactic object, so the displaced syntactic object also provides the label; see (51).

(50) Base position

```
        YP
       ╱╲
      Y    ZP
          ╱╲
         Z    XP
            [•YP•]
```
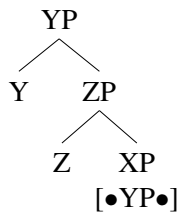
(51) Movement and projection

```
             XP
            ╱╲
          XP    YP
        [•Y̶P̶•̶]  ╱╲
               Y    ZP
                   ╱╲
                  Z   ‾
```
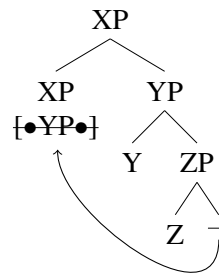
This implementation of projecting movement is conceptually based on the earlier work by Fanselow (2003) (see also Surányi 2005 and Georgi & Müller 2010), which entertains the idea of movement being triggered directly by the features of a displaced syntactic object, but pursues a different technical implementation.[3]

I will now turn to relative clauses and show how raising syntax is derived. A sentence that contains a raising relative clause starts with the Numeration as in (52). It contains syntactic heads and their features. The features are ordered (see Müller 2010, Georgi 2014, Murphy & Puškar 2018). Among other syntactic objects, the Numeration obligatorily contains the relative pronoun D_{rel}, the relative C head, and the NP with [•CP•] that will be the head of the relative clause. These three syntactic objects transitively select each other, so that one of them has to enter the derivation and be itself selected by a higher material before all of its merge features can be satisfied.
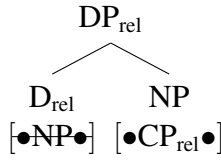
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[3]Fanselow (2003) offers the metaphor of Münchhausen-style movement after the German literary character Baron Münchhausen who saved himself from drowning by pulling up on his own hair.

(52) Numeration for raising relative clauses:

$$\left\{\ \begin{bmatrix} \bullet\text{TP}\bullet \\ \bullet\text{DP}_{\text{rel}}\bullet \end{bmatrix}^{\text{C}_{\text{rel}}}\ ,\ \dots\ ,\ \begin{bmatrix} \bullet\text{DP}\bullet \\ \dots \end{bmatrix}^{\text{V}}\ ,\ \begin{bmatrix} \bullet\text{NP}\bullet \\ \dots \end{bmatrix}^{\text{D}_{\text{rel}}}\ ,\ \begin{bmatrix} \dots \\ \bullet\text{CP}_{\text{rel}}\bullet \\ \dots \end{bmatrix}^{\text{N}}\ ,\ \dots\ \right\}$$

In the first step of the derivation, the relative pronoun D_{rel} is merged with the head NP. The latter has unchecked merge feature $[\bullet\text{CP}_{\text{CP}}\bullet]$.[4] After this, the derivation proceeds in the regular way and the relative CP is built as illustrated in (53).

(53) Step 1: Relative DP (54) Step 2: Relative CP
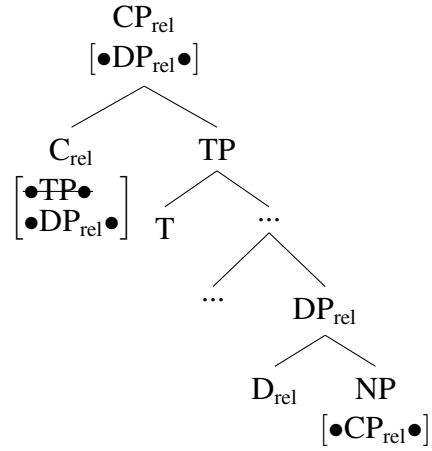
After merge of C_{rel} and checking of its first merge feature $[\bullet\text{TP}\bullet]$, there are two unchecked merge probes in the derivation $[\bullet\text{DP}_{\text{rel}}\bullet]$ on the C_{rel} head and $[\bullet\text{CP}_{\text{rel}}\bullet]$ on the NP. Both probes have located their goals and I suggest that at this point copies of the two syntactic objects that are to be displaced are subsequently created and merged to workspace, where similarly to features on the heads they are organized in a stack (Heck 2016, Heck & Himmelreich 2017). I assume that the upward search is given precedence over the downward search (Assmann et al. 2015, Bjorkman & Zeijlstra 2019), so that the head NP is copied first. The remainder of the relative DP that contains the relative pronoun is copied and placed in the stack afterwards; see (55).
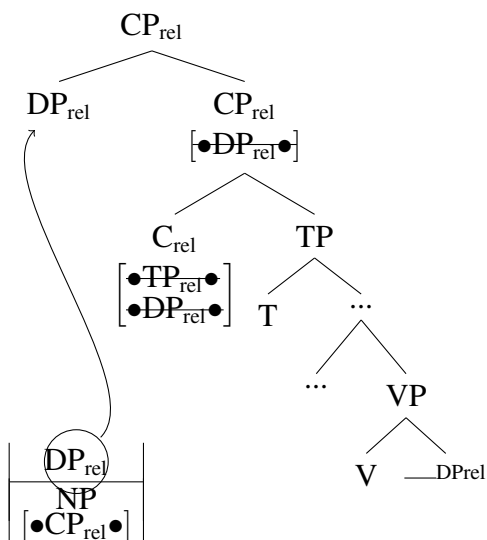
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[4]Alternative derivations where other syntactic objects from the numeration in (52) enter the derivation with an active merge feature do not converge; i.e., it turns out impossible to empty the numeration and satisfy the active features on syntactic objects.

(55)   Step 3: Search and copying
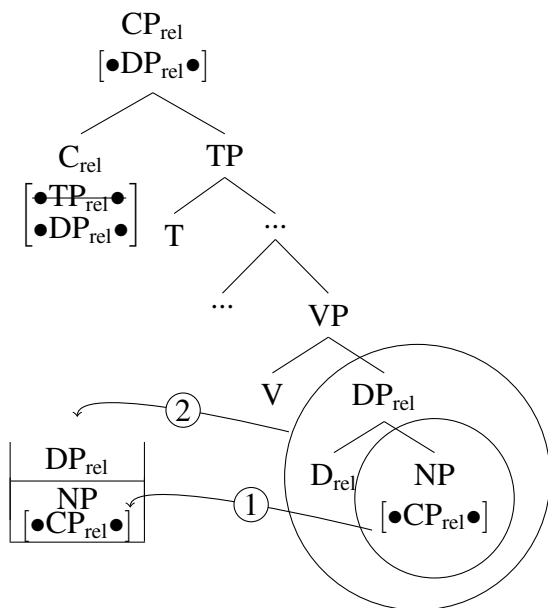
The syntactic object that is put to the stack last appears on the top of the stack and therefore must be merged back to the derivation as the first one. In (56), the DP$_{rel}$ is merged with the relative CP. The head NP is merged with this CP in the next step; see (57). The NP checks its own selection feature [•CP$_{rel}$•] and therefore projects in its landing site. This gives rise to projecting movement.

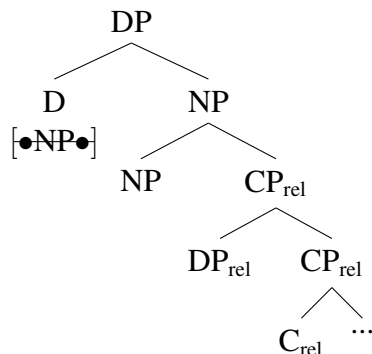(56)   Step 4: Merge of DP$_{rel}$ (57)   Step 5: Merge of the head NP
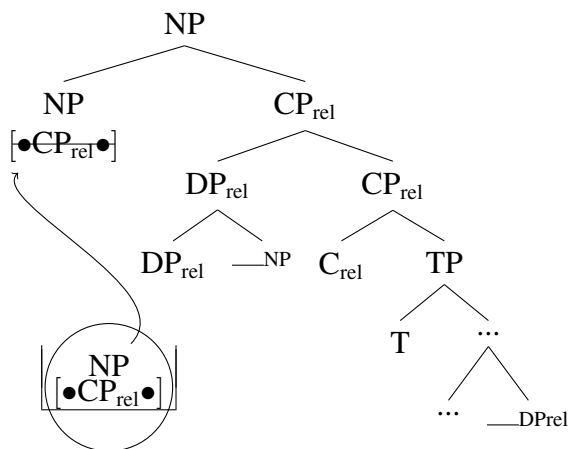
The top projection is thus labeled NP and it can be selected by the external D head. A regular DP structure for the head noun phrase is derived.

(58) Step 6: Merge of the external D head

```
              DP
           ╱      ╲
        D           NP
     [•NP•]      ╱     ╲
              NP        CP_rel
                     ╱        ╲
                 DP_rel        CP_rel
                            ╱      ╲
                         C_rel      ...
```

To sum up, in this section I have suggested the analysis of raising relative clauses that involves projecting phrasal movement. The analysis shows that projecting movement comes for free once the projection by selection principle is combined with upward probing. In the next section, I will turn to the case marking on the head noun.

4.3 Internal vs. external case

In Moksha, raising derivation produces relative clauses with ICA, i.e., the noun raised from within the relative CP is marked for a case assigned inside the relative CP. While such internal case marking on the head noun is rather rare, it is also attested in several other languages, including, for instance, ancient Greek (Grimm 2005: 78-92), Latin (Touratier 1980: 147-211), Ingrian Finnish (Kholodilova 2013), Nez Perce (Deal 2016), and Koryak (Abramovitz 2021). In the absence of the evidence to the contrary, I assume that these languages also instantiate the raising derivation with the internal case marking on the head noun.

At the same time, raising derivation was originally proposed on the basis of languages where the head noun is marked for the case assigned in the main clause. For instance, such external case marking is attested in Polish:

(59) Widziałem tego   pana,   co   zbił ci   szybę.
     saw.1SG   the.ACC man.ACC what broke your.SG   glass.ACC

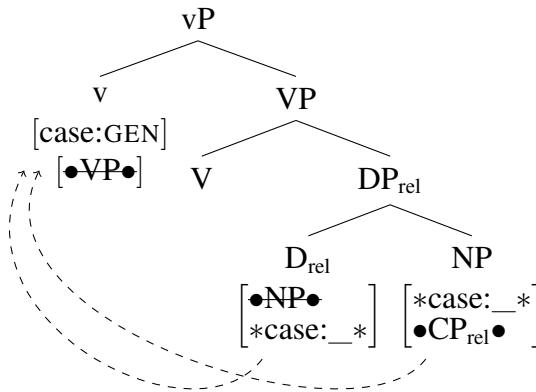   'I saw the man who broke your glass.' (Borsley 1997: 635).

German data in (60) also illustrate the head DP with the case assigned in the main clause. The example also combines such external case marking with anaphor binding within the relative CP. The head noun phrase contains reflexive pronoun *sich* that is bound by the subject of the relative clause. Such binding argues that the relative clause is derived by raising.

(60) Der   Wesenszug von **sich**ᵢ, [den   **Peter**ᵢ noch nicht __ kannte], störte
     the.NOM trait   of self   which.ACC Peter   still not   knew   annoyed
     niemanden.
     no.one

     'No one was annoyed by the side of himselfᵢ that Peterᵢ did not know yet.' (Salzmann;
   2006: 99)

Note that relative clauses with external case in Moksha discussed above do not belong to this type and are different in that they show no reconstruction effects to the relative clause internal position and were therefore argued to be derived by head-external generation, not raising. But while Moksha demonstrates correspondence between the derivation of the relative clause and case marking on the head noun, German data in (60) show that relative clauses with external case are derived by raising in other languages.

Thus, depending on the case marking of the head DP two types of the raising relative clauses can be distinguished: raising relatives with internal case in languages with ICA and raising relatives with external case in languages like German or Polish. I suggest that the two types follow from different orderings of the case probe and the $[\bullet CP_{rel}\bullet]$ feature on the N head. The first type of raising relatives where the head noun shows case assigned in the relative clause is derived if the case probe is ordered before $[\bullet CP_{rel}\bullet]$. This ordering ensures that case is valued first, when the head noun is inside the relative CP; see (61). After the case probe is valued, the lower ordered $[\bullet CP_{rel}\bullet]$ feature becomes available and once the relative CP is built, it triggers projecting movement of the head NP. In the main clause, the head noun appears in a position where some case (dative in the derivation below) can be assigned to a noun phrase, but it cannot be assigned in this scenario because the case probe on the noun already has a value; see (62).
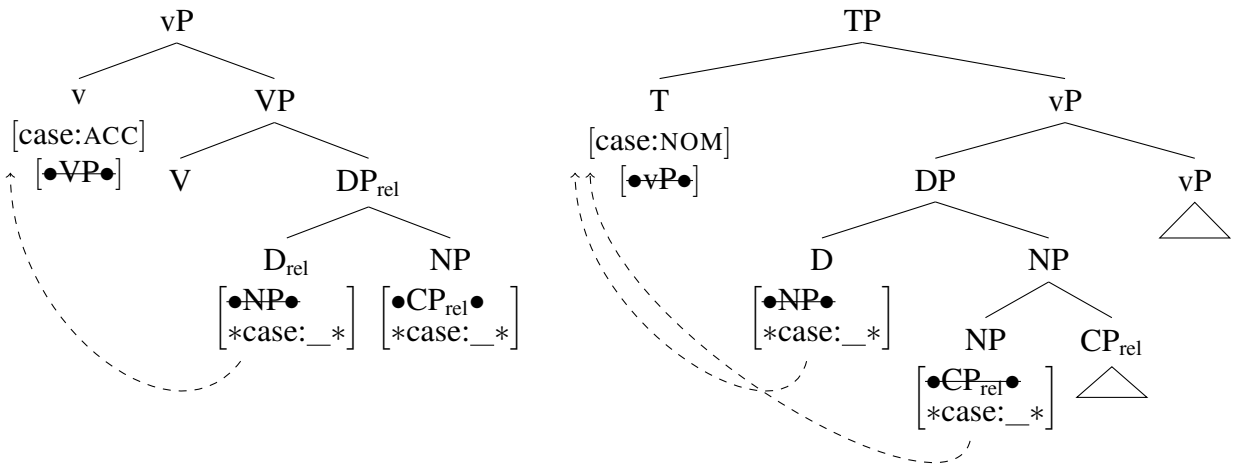
(61)   Internal case: In the relative CP   (62)   Internal case: In the main clause
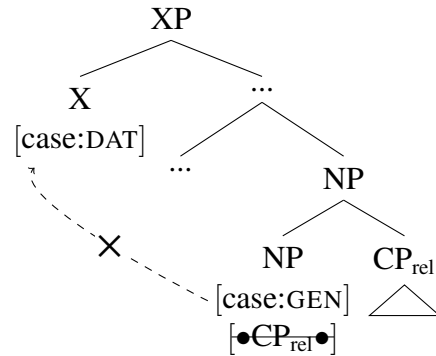
The reverse ordering of the case probe and the $[\bullet CP_{rel}\bullet]$ produces raising relative clauses with external case. If the case probe is ordered after the merge feature, case assignment may take place only after the merge feature is discharged, i.e., only after the head noun moves to the main clause, out of the domain of case assigners in the relative CP. As a result, the head noun gets case only after its movement to the main clause. The structure in (63) shows case assignment in the relative clause. At this point, $[\bullet CP_{rel}\bullet]$ is not checked, so that $[*case:\_*]$ on N is not yet accessible. The case probe on the relative pronoun D_{rel} is at the top of its stack, so the relative pronoun gets case in the relative CP. The structure in (64) illustrates the case assignment in the main clause. Feature $[\bullet CP_{rel}\bullet]$ is checked upon the movement of the head NP to the main clause, so that $[*case:\_*]$ becomes accessible and the head can get its case in the main clause.

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(63) External case: In the relative CP

(64) External case: In the main clause

vP
- v [case:ACC] [•VP•]
- VP
  - V
  - DP_rel
    - D_rel [•NP• *case:__*]
    - NP [•CP_rel• *case:__*]

TP
- T [case:NOM] [•vP•]
- vP
  - DP
    - D [•NP• *case:__*]
    - NP
      - NP [•CP_rel• *case:__*]
      - CP_rel
  - vP

The two types of raising relative clauses and the ordering of features on the noun underlying them are summarized in (65):

(65) Case marking on the head under raising

Pattern	Ordered features on the N head
1. Internal case (ICA) *Latin, Moksha, Nez Perce etc.*	$[*\text{case:}\_\,*] \prec [\bullet\text{CP}_{rel}\bullet]$
2. External case *German, Polish, Italian etc.*	$[\bullet\text{CP}_{rel}\bullet] \prec [*\text{case:}\_\,*]$

The analysis accounts for an obligatory early valuation of case in relatives with ICA by ordering the case feature before the merge feature and for a delayed valuation of case in raising relatives with a regular case by ordering the case feature after the merge feature. The latter ordering shields case from the probing at earlier stages. This approach seems to also enable a novel perspective on several other phenomena that were conceived of as case overwriting in previous literature (Bejar & Massam 1999, Merchant 2006, Potsdam 2006, Boeckx et al. 2010, Fong 2019, i.a).

4.4 Summary and outlook

In this section, I have presented the analysis of relative clauses with ICA in Moksha. This account provides a novel implementation of the raising derivation and allows to combine the raising syntax and the regular DP structure in the main clause. This result is achieved by projecting movement of the noun phrase. Projecting movement is shown to be a direct consequence of two otherwise well-established assumptions: projection by selection approach to labeling and upward search.

The analysis also accounts for the internal and external case markings on the head noun attested in raising relative clauses cross-linguistically. The account suggests that different orderings of the

case probe and the merge feature that is responsible for movement of the head noun produce the two types of raising relative clauses.

Both core components of the analysis, projecting movement and timing of case assignment, are coached in the approach to syntax where Merge is feature-driven (Chomsky 1957; 1993. Adger 2003, Abels 2012, Collins & Stabler 2016, Müller 2017, Zyman 2018) and features on syntactic heads are ordered (Müller 2010, Georgi 2014; 2017, Assmann et al. 2015, Murphy & Puškar 2018). I would like to suggest that the account of intricate data on Moksha relative clauses provides further empirical ground for this highly deterministic model of syntax.

In the reminder of this paper, I will go through further properties of relatives with ICA in Moksha and show that they are compatible with the proposed analysis.

5 Other properties

5.1 Coordination

The first property of relative clauses with ICA in Moksha that I will be discussing in this section is the possibility to coordinate two relative CPs under one head. Coordination is a commonly used constituency diagnostic that in the literature on relative clauses was used to determine whether the relative clause is externally- or internally-headed. The argument goes as follows: If two relative CPs can be coordinated under one head noun as schematized in (66), the head noun must be outside the relative CP and the relative clause is thus externally-headed.

(66)   [$_{DP}$ D NP [$_{\&P}$ [$_{CP}$ C ...] and [$_{CP}$ C ...]]]

The data in (67) show coordination of two relative clauses with ICA in Moksha. The same case is assigned to the head noun in both conjuncts and the head noun is marked for this case.

(67)   ICA: external case – NOM, internal case – GEN

Jalga-t'   [**kona-n'**   vɛt'-in'ə   kud-u]   i   [**kona-n'**
friend-DEF.SG.GEN   which-GEN bring-PST.3.O.1SG.S house-LAT and   which-GEN

and-in'ə   l'ɛm-də] kurək n'i   tu-j.
feed-PST.3.O.1SG.S soup-ABL soon   already go-NPST.3[SG]

'The friend that I brought home and that I gave soup is leaving soon.'

At the first sight, these data seem to argue for the externally-headed status of relatives with ICA, but approaches positioning the head on the left edge inside relative CP can in fact derive these data as well. Nothing precludes the overt head noun from being positioned inside the first conjunct, while the head inside the second conjunct could be zero or deleted under identity (see Borsley 1997, Bianchi 2000a;b).

(68)   [$_{DP}$ D [$_{\&P}$ [$_{CP}$ head C ...] and [$_{CP}$ ~~head~~ C ...]]]

An evidence against such reanalysis of basic coordination data comes from relative clauses where different cases are assigned in the two conjuncts. As shown in (69), the head of coordinated CPs can be then marked for case from either of the two conjuncts.

(69) a. ICA: external case – NOM, internal case – GEN & DAT

Jalga-t' [**kona-n'** vɛt'-in'ə kud-u] i [**kona-n'd'i**
friend-DEF.SG.GEN which-GEN bring-PST.3.O.1SG.S house-LAT and which-DAT

n'ɛft'-in'ə od škaf-t'] kurək n'i tu-j.
show-PST.3.O.1SG.S new cupboard-DEF.SG.GEN soon already go-NPST.3[SG]

'The friend who I brought home and whom I showed the new cupboard is going to leave soon.'

b. ICA: external case – NOM, interncal case – GEN & DAT

Jalga-t'i [**kona-n'** vɛt'-in'ə kud-u] i [**kona-n'd'i**
friend-DEF.SG.DAT which-GEN bring-PST.3.O.1SG.S house-LAT and which-DAT

n'ɛft'-in'ə od škaf-t'] kurək n'i tu-j.
show-PST.3.O.1SG.S new cupboard-DEF.SG.GEN soon already go-NPST.3[SG]

'The friend who I brought home and whom I showed the new cupboard is going to leave soon.'

Nevertheless, coordination still does not present a good diagnostic for the relative clause type because coordination may still involve constituents smaller than the full CPs as schematized in (70). In that case, the head is above coordinated phrases, but inside the relative CP (Bianchi 2000a;b).

(70) [$_{DP}$ D [$_{CP1}$ head [$_{\&P}$ [$_{CP2}$ __head ...] and [$_{CP2}$ __head ...]]]]

To sum up, relatives with ICA allow coordination of two relative clauses under one head. This seems to provide evidence supporting externally-headed status of these relative clauses, but in fact alternative interpretations of the data cannot be excluded on the basis of the coordination data only.

5.2 Extraposition

The next property is extraposition. It is another common diagnostic for syntactic structure of relative clauses. In particular, it was suggested that the possibility to extrapose the relative CP to the right and leave the head noun in situ as in (71) argues that the head is outside the relative CP, while the inability to separate the relative clause from the head noun should show that the relative clause is internally-headed.

(71) [... DP$_{head}$ ... V ... [$_{CP}$ rel.pron ...]]

Applying extraposition diagnostic to relatives clauses in Moksha yields a different result than the coordination diagnostic: Relatives with ICA cannot be extraposed. However I will show that similarly to coordination, extraposition does not present a reliable diagnostic for the relative clause structure. I suggest an alternative interpretation for the ban on extraposition.

Ungrammaticality of extrapostion for relative clauses with ICA is illustrated in (72). In this example, the relative CP is positioned on the right edge of the sentence and the head noun bears internal case.[5]

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[5]Abramovitz (2021) takes analogous data in Koryak as an indication that relative clauses with ICA are internally-headed.

(72) ICA: external case – NOM, internal case – DAT

*S't'ər'-n'ɛ-t'i   tu-s'   kaftə n'ed'ɛl'a-t [**kona-n'd'i** maks-in'ə

girl-DIM-DEF.SG.DAT go-PST.3[SG] two week-PL   which-DAT give-PST.3.O.1SG.S

kel'gəma kn'iga-z'ə-n'].

favorite book-1SG.POSS.SG-GEN

'The girl left for two weeks, whom I gave my favorite book.'

Data in (73) illustrate that in Moksha extraposition is grammatical for relative clauses with external case.

(73) No ICA: extenal case – NOM, internal case – DAT

S't'ər'-n'ɛ-s'   tu-s'   kaftə n'ed'ɛl'a-t [**kona-n'd'i** maks-in'ə

girl-DIM-DEF.SG.NOM go-PST.3[SG] two week-PL   which-DAT give-PST.3.O.1SG.S

kel'gəma kn'iga-z'ə-n'].

favorite book-1SG.POSS.SG-GEN

'The girl left for two weeks, whom I gave my favorite book.'

I would like to suggest that the ungrammaticality of extraposition does not indicate that the head noun is inside the relative clause at the surface level, but is expected once the head noun was inside the relative clause at an earlier stage of the derivation; that is, if a relative clause is derived by raising as already suggested for relatives with ICA.

According to Fox & Nissenbaum (1999), extraposition to the right is derived as follows: First, the head DP that is not yet modified by the relative clause is moved to the right edge. Then, the relative clause is late merged to the head noun. Finally, the higher copy of the head DP is deleted and the lower copy is pronounced. The derivation is schematized in (74a-c).

(74) a. Movement of the head NP

[$_{MC}$ [... DP ...] DP]

b. Late adjunction of the relative CP

[$_{MC}$ [... DP ...] [DP [$_{CP}$ rel.pron ...]]]

c. Realization of the lower copy of DP

[$_{MC}$ [... DP ...] [~~DP~~ [$_{CP}$ rel.pron ...]]]

Under the raising analysis, the head noun originates inside the relative clause. Therefore, independently of its final position, the head noun cannot be merged with the main clause material before it is combined with the relative CP as it is required in the first step of the derivation in (74). Thus, it is the raising derivation that blocks CP extaposition and the diagnostic does not provide evidence that the head noun stays within the relative clause. More generally, a ban on extraction is also observed for raising relative clauses in other languages (see Hulsey & Sauerland 2006, Takahashi & Hulsey 2009 on English).[6]

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[6]Hulsey & Sauerland (2006) assume the version of the raising derivation where the head noun stays within the rel-

5.3 Left periphery restriction

The next property is specific to the relative clauses with ICA and deals with positional restrictions of these relatives clauses. As shown in (75)-(76), relative clauses with ICA must be placed on the left edge of the sentence. They cannot follow the main clause material.

(75) ICA: external case – GEN, internal case – DAT

Škaf-t'i [**kona-n'd'i** mon put-in'ə fətəgrafijə-t'n'ə-n'] min'
closet-DEF.SG.DAT which-DAT I put-PST.3.O.1SG.S photo-DEF.PL-GEN we

jorda-s'k.
throw.away-PST.3.O.1PL.S

'We threw away the cabinet where I put the photos.'

(76) ICA: external case – GEN, internal case – DAT

*Min' jorda-s'k **škaf-t'i** [**kona-n'd'i** mon put-in'ə
 we throw.away-PST.3.O.1PL.S closet-DEF.SG.DAT which-DAT I put-PST.3.O.1SG.S

fətəgrafijə-t'n'ə-n'].
photo-DEF.PL-GEN

'We threw away the cabinet where I put the photos.'

This restriction does not apply to relative clauses with external case; see (77).

(77) No ICA: external case – GEN, internal case – DAT

Min' jorda-s'k **škaf-t'** [**kona-n'd'i** mon put-in'ə
we throw.away-PST.3.O.1PL.S closet-DEF.SG.GEN which-DAT I put-PST.3.O.1SG.S

fətəgrafijə-t'n'ə-n'].
photo-DEF.PL-GEN

'We threw away the cabinet where I put the photos.'

The left periphery restriction is attested in other languages with ICA (see Bianchi 1999, Kholodilova 2013, Kholodilova & Privizentseva 2015, Deal 2016, Abramovitz 2021) and is also typical for correlatives that standardly have an internal head (see Srivastav 1991, Dayal 1996, Lipták 2009, Lin 2020). This positional restriction might be therefore viewed as an argument against externally-headed status of relatives with ICA. I will present three arguments showing that relatives with ICA in Moksha are different from correlatives in that relatives with ICA are moved to the left edge, while correlatives are base generated there.

The first diagnostic is based on the fact that movement is typically restricted by islands: If the relative clause is embedded into an island, movement to the left must be blocked, while the base generation at the left edge could still be possible. In (78), the relative clause with ICA positioned at the left edge is associated with the position within the adjunct island and the sentence is ungrammatical.

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ative CP in the specifier of an extended C projection. The discussion of extraposition above shows that this assumption is not necessary and the raising of the head noun is already sufficient to account for ungrammaticality of extraposition.

(78) ICA: external case – NOM, internal case – GEN

*Katə-t' [kona-n' t'ejə-n kaz'-əz'] mon
cat-DEF.SG.GEN which-GEN PRON.DAT-1SG.POSS gift-PST.3.O.3PL.S I

ul'-an kən'ɛr'd'-f [kədə ___ karma-j kunc'-əmə
be-NPST.1SG happy-PTCP.RES if become-NPST.3[SG] catch-FREQ.INF

šejər̥'-t'].
mouse-PL

'I will be happy if the cat that they gifted to me starts catching mice.'

Internally-headed correlatives do not have this restriction and can correlate with the position within an island:

(79) Correlative construction

[Kona katə-t' t'ejə-n kaz'-əz'] mon ul'-an
which cat-DEF.SG.GEN PRON.DAT-1SG.POSS gift-PST.3.O.3PL.S I be-NPST.1SG

kən'ɛr'd'-f [kədə ___ karma-j kunc'-əmə šejər̥'-t'].
happy-PTCP.RES if become-NPST.3[SG] catch-FREQ.INF mouse-PL

'I will be happy if the cat that was gifted to me starts catching mice.'

The second argument comes from variable binding. Data in (80) show that a variable inside the relative clause with ICA can be bound by a quantified noun phrase in the main clause.

(80) ICA: external case – GEN, internal case – DAT

Pin'ə-t'i [kona-n'd'i **son$_i$** maks-əz'ə jar̥cambɛl'-t']
dog-DEF.SG.DAT which-DAT PRON.3SG give-PST.3SG.O.3SG.S food-DEF.SG.GEN

ɛr' **s'ora-n'ɛ-s'$_i$** mɛl'aft-əz'ə.
every boy-DIM-DEF.SG.NOM remember-PST.3SG.O.3SG.S

'Every boy$_i$ remembered the dog that he$_i$ gave food.'

The pronoun inside a correlative clause, on the contrary, cannot co-vary with the quantified noun phrase in the main clause. Example (81) has the single interpretation, under which some third person fed the dog.

(81) Correlative construction

[Kona pin'ə-t'i **son$_{j/*i}$** maks-əz'ə jar̥cambɛl'-t'] **ɛr'**
which dog-DEF.SG.DAT PRON.3SG give-PST.3SG.O.3SG.S food-DEF.SG.GEN every

s'ora-n'ɛ-s'$_i$ mɛl'aft-əz'ə.
boy-DIM-DEF.SG.NOM remember-PST.3SG.O.3SG.S

'Every boy$_i$ remembered the dog that he$_{j/*i}$ gave food.'

The final argument comes from coordination. Data in (82) show that a relative clause with ICA can be coordinated with a noun phrase that is marked for the case assigned in the main clause. Such case marking suggests that the full coordinated noun phrase occupied a case assignment position in the main clause prior to its movement to the left edge.

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(82) ICA: external case – GEN, internal case – DAT

Ečkə **katə-t'**   i   osal **pin'ə-t'i**   [kona-n'd'i   ton maks-at
thick cat-DEF.SG.GEN and skinny dog-DEF.SG.DAT   which-DAT you give-NPST.2SG

jar̥ca-ma] mon soda-sajn'ə.
eat-NZR   I   know-NPST.3PL.O.1SG.S

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

I conclude that relative clauses with ICA are not base generated at the left edge, but move to this position as sketched in (83).

(83) Relative clauses with inverse case attraction

a. [_MC ... predicate ... [head [_CP ...]] ...]

b. [[head [_CP ...]] [_MC ... predicate ... ___ ...]

Thus, placement on the left periphery does not in fact group relatives with ICA and correlatives and provides no insight in whether relatives with ICA are externally- or internally-headed. At this moment, I will leave the exact account of movement of relatives with ICA to the left beyond the scope of this paper and tentatively suggest that it is required because the head DP that bears case assigned within the relative clause cannot appear in the position where another case is assigned in the main clause; see Abramovitz (2021) or Author (2022) for possible technical implementations.

5.4   Extraction out of the relative clause

The final property of relative clauses is extraction out of the relative CP. The data in (84a-b) show that relatives with ICA in Moksha allow limited extraction out of the relative CP. Such extraction is ungrammatical for relatives with external case.

(84) a. ICA: external case – NOM, interncal case – DAT

Bibl'iat'eka-stə [**jalga-z'ə-n'd'i**   [kona-n'd'i   mon sɛv-in'ə
library-EL   friend-1SG.POSS.SG-DAT   which-DAT I   take-PST.3.O.1SG.S

kn'iga-t'   ___]] kelk-si   luv-əm-s.
book-DEF.SG.GEN   love-NPST.3SG.O.3SG.S read-INF-ILL

'My friend for whom I took the book from the library loves to read.'

b. No ICA: external case – NOM, interncal case – DAT

*Bibl'iat'eka-stə [**jalga-z'ə**   [kona-n'd'i   mon sɛv-in'ə
library-EL   friend-1SG.POSS.SG[NOM]   which-DAT I   take-PST.3.O.1SG.S

kn'iga-t'   ___]] kelk-si   luv-əm-s.
book-DEF.SG.GEN   love-NPST.3SG.O.3SG.S read-INF-ILL

'My friend for whom I took the book from the library loves to read.'

Abramovitz (2021) observes similar extraction for relative clauses with ICA in Koryak (see also Belyaev 2012 on Beserman). He suggests that extracted phrase stays inside the relative CP, in one of the split-CP projections and uses this as an argument for internally-headed syntax of these relatives. Data in (85) demonstrate that the extracted noun phrase can be interleaved with the main clause material. This shows that extraction indeed proceeds to the position outside of the relative CP.

(85) ICA: external case – NOM, internal case – GEN

    <u>Bibl'iat'eka-stə</u> mon ar's'-an [čtə [**kn'iga-t'** kona-n'
    library-EL I think-NPST.3[SG] that book-DEF.SG.GEN which-GEN

    sɛv-əz'ə __ Kat'ɛ] ašč-i stol-sə].
    take-PST.3SG.O.3SG.S Katja be-NPST.3[SG] table-IN

    'I think that the book that Katja took from the library is on the table.'

While relative clauses are a textbook example of island structures (Ross 1967), there are numerous cases in the literature showing that limited extraction out of a relative clause is possible under certain conditions (Erteschik-Shir 1973, McCawley 1981, Engdahl 1997, Cinque 2010, Kush et al. 2013, Sichel 2018, Vincent 2021). The restrictions on such extraction are not the same across languages, but seem to be often associated with the raising derivation. Following Sichel 2018 (in spirit, but not in letter), I would like to suggest that extraction out the relative clause in Moksha is also conditioned by the raising syntax.

    Limited extraction out of the raising relative clauses in Moksha can be accounted as follows: First, phases constitute locality domains in syntax and extraction out of them must proceed through the phase edge; see the Phase Impenetrability Condition (PIC) in (86). CPs as well as DPs are phases (Svenonius 2004, Matushansky 2004, Bošković 2014).

(86) Phase Impenetrability Condition:
    In phase α with head H, the domain of H is not accessible to operations outside α, only H and its edge are accessible to such operations. (Chomsky 2000: 108)

Second, movement to the phase edge is driven by edge features (Chomsky 2000; 2001; 2008) and edge features are ordered with respect to other features on the phase head (Müller 2010, Georgi 2014). Third, in Moksha edge features in a DP are ordered after the case probe. As a result, movement to the DP edge in Moksha is possible only after this DP gets case.[7]

    The derivation of extraction from the relative clause with ICA is illustrated in (87)-(88). In (87), the external D head receives its case from the NP that was raised from within the relative CP and therefore is already marked for case. After the case assignment, the edge feature of the D head

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[7]This analysis implies a more general ban on extraction out of DPs in Moksha. In particular, DPs not modified by a raising relative clause will always get their case feature assigned later in the derivation, so that their edge features are also inaccessible until it is too late to extract any DP-internal material to the edge. I suggest that syntactic objects that can be extracted out of the DP must be first merged in Spec,DP or moved there due to some DP-internal considerations, but without employing the edge features. Syntactic objects extracted out of the relative clause are different, because they do not strictly speaking belong to the DP and there can be therefore no independent reasons for them to move to the DP edge.

is accessible and this allows for the XP that needs to be extracted to move from CP edge to the DP edge; see (88).

(87)   External D gets internal case   (88)   Movement to DP edge
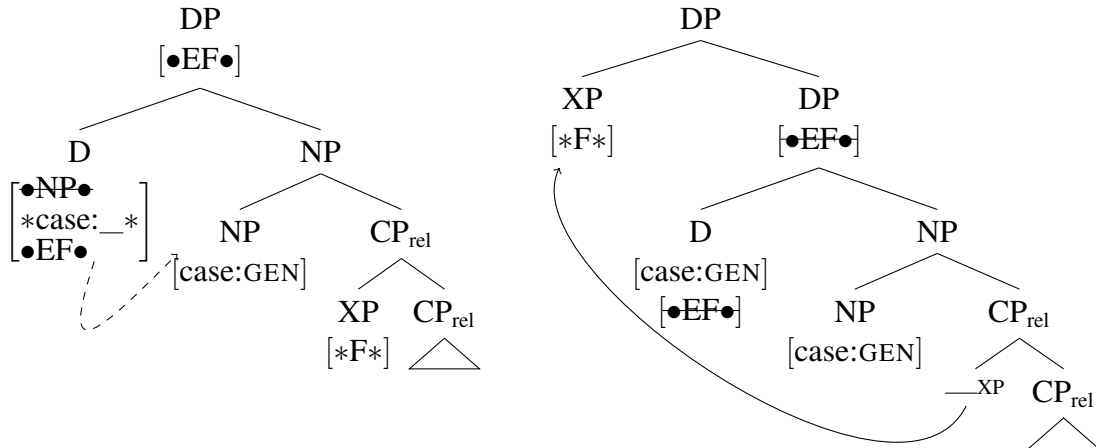
Heads of regular externally-headed relative clauses, on the contrary, receive case from higher projections in the main clause, when the material in their complement is already rendered inaccessible by PIC:

(89)   No extraction out of relatives with external head
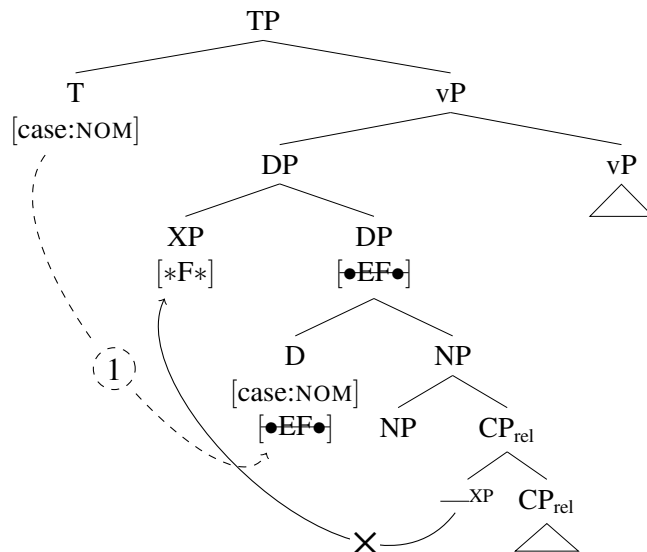
To sum up, extraction out of the relative CP attested for relatives with ICA, but not for externally-headed relative clauses is compatible with the analyses of these relative clauses. The account ties

the possibility of extraction to timing of case assignment in different relative clauses.

6   Conclusion

On the empirical side, this paper presents novel data on relative clauses in Moksha Mordvin. It shows that the language has a rare type of relative clauses where a head of an externally-headed relative clause shows case assigned in the relative CP. Such relative clauses co-exist with relatives where the head noun shows regular external case. The study of the two relative clause types reveals a correspondence between case marking on the head noun and reconstruction effects (idioms, anaphor binding, condition C).

These empirical findings are accounted for if the raising derivation is part of natural language syntax and if raising co-exists with the head-external structure. I then argue that the raising derivation involves projecting movement of the head noun and show that it naturally follows from projection by selection principle combined with upward search.

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